

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
18 March 2010 (18.03.2010)

PCT

(10) International Publication Number
WO 2010/030793 A3

(51) International Patent Classification:

G06F 15/16 (2006.01) G06F 11/08 (2006.01)
G06F 13/14 (2006.01) G06F 12/16 (2006.01)

94089 (US). KOHR, David R, Jr. [US/US]; 495 East Java Drive, Sunnyvale, California 94089 (US).

(21) International Application Number:

PCT/US2009/056530

(74) Agents: BECKER, Jordan M. et al.; Perkins Coie LLP, P.O. Box 1208, Seattle, Washington 98111-1208 (US).

(22) International Filing Date:

10 September 2009 (10.09.2009)

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

12/209,166 11 September 2008 (11.09.2008) US

(71) Applicant (for all designated States except US): NETAPP, INC. [US/US]; 495 East Java Drive, Sunnyvale, California 94089 (US).

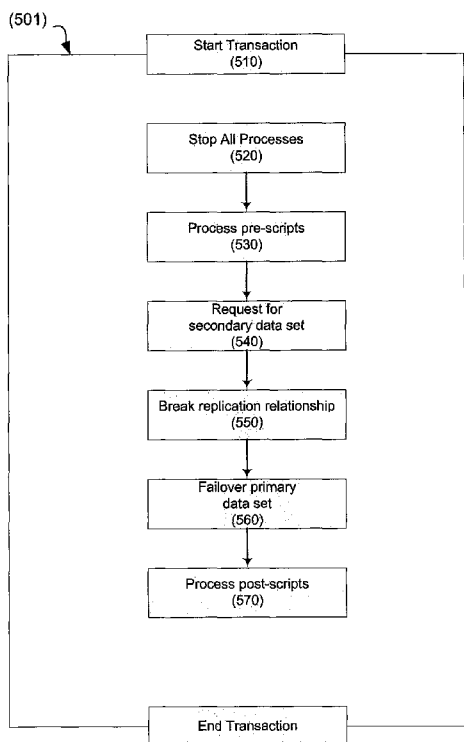
(72) Inventors; and

(75) Inventors/Applicants (for US only): SMOOT, Peter L. [US/US]; 495 East Java Drive, Sunnyvale, California

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE,

[Continued on next page]

(54) Title: TRANSACTIONAL FAILOVER OF DATA SETS



(57) Abstract: A network storage server implements a method to perform transactional failover of data sets. Multiple storage objects are organized into primary and secondary data sets, and a disaster recovery policy is configured for failing-over a primary data set to a secondary data set. A failover operation is defined for the disaster recovery policy. The failover operation includes multiple failover actions. During a failover situation, the failover operation is invoked to fail-over the primary data set. The failover operation is transactionally processed to ensure that all failover actions of the failover operation are performed in a single transaction.

Fig. 5

WO 2010/030793 A3



ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,
MC, MK, MT, NL, NO, PL, PT, RO, SE, SI, SK, SM,
TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
ML, MR, NE, SN, TD, TG).

— before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments (Rule 48.2(h))

Published:

— with international search report (Art. 21(3))

(88) Date of publication of the international search report:

17 June 2010

A. CLASSIFICATION OF SUBJECT MATTER*G06F 15/16(2006.01)i, G06F 13/14(2006.01)i, G06F 11/08(2006.01)i, G06F 12/16(2006.01)i*

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: G06F

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

Korean Utility models and applications for Utility models since 1975

Japanese Utility models and applications for Utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKOMPASS(KIPO internal) "Keywords: failover, storage system, recovery policy, transaction, and similar terms"

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2002-0133735 A1 (MCKEAN et al.) 19 September 2002	1,3-14,16-24
Y	See the abstract, figures 1 and 5-9, and paragraphs [0030-0034], [0042-0044] and [0063-0067].	2, 15
Y	US 7,111,194 B1 (SCHOENTHAL et al.) 19 September 2006	2
A	See the abstract, figures 1 and 6-10, and col. 4 lines 26-34, col. 11 lines 24-27 and col. 13 lines 15-21.	1, 3-24
Y	US 6,144,999 A (KHALIDI et al.) 07 November 2000	15
A	See the abstract, figures 1-2, 6-7 and 10, and col. 23 line 3 - col. 24 line 4.	1-14, 16-24
A	US 6,643,795 B1 (SICOLA et al.) 04 November 2003	1-24
	See the abstract, figures 3-4, 9-10 and 14-16, and col. 17 line 32 - col. 20 line 29.	
A	US 7,114,049 B2 (ACHIWA et al.) 26 September 2006	1-24
	See the whole document.	

 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 application or patent 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 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

"&" document member of the same patent family

Date of the actual completion of the international search

16 APRIL 2010 (16.04.2010)

Date of mailing of the international search report

20 APRIL 2010 (20.04.2010)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
Government Complex-Daejeon, 139 Seonsa-ro, Seo-gu, Daejeon 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

NHO, Ji Myong

Telephone No. 82-42-481-8528



INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2009/056530

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2002-0133735 A1	19.09.2002	US 06681339 B2	20.01.2004
US 07111194 B1	19.09.2006	US 07392425 B1	24.06.2008
US 06144999 A	07.11.2000	GB 2341958 A	29.03.2000
US 06643795 B1	04.11.2003	None	
US 07114049 B2	26.09.2006	EP 1843249 A3	24.12.2008
		EP 1843249 A2	10.10.2007
		EP 1333371 A3	25.11.2009
		EP 1333371 A2	06.08.2003
		EP 1283469 A3	16.07.2008
		EP 1283469 A2	12.02.2003
		EP 0981091 B1	19.03.2008
		EP 0981091 A3	25.10.2006
		EP 0981091 A2	23.02.2000
		EP 0926585 A3	07.06.2006
		EP 0926585 A2	30.06.1999
		EP 0902370 B1	26.12.2007
		EP 0902370 A3	03.05.2006
		EP 0902370 A2	17.03.1999
		EP 0848321 B1	15.10.2008
		EP 0848321 A3	18.05.2005
		EP 0848321 A2	17.06.1998
		EP 0784260 B1	27.10.2004
		EP 0784260 A1	16.07.1997
		JP 2004-185644 A	02.07.2004
		JP 2003-122509 A	25.04.2003
		JP 2002-196989 A	12.07.2002
		JP 2002-259183 A	13.09.2002
		JP 2000-132343 A	12.05.2000
		JP 11-184641 A	09.07.1999
		JP 11-085408 A	30.03.1999
		JP 10-171605 A	26.06.1998
		JP 09-190292 A	22.07.1997
		JP 4135855 B2	20.08.2008
		JP 3970535 B2	05.09.2007
		JP 3414218 B2	09.06.2003
		JP 3410010 B2	26.05.2003
		JP 3287203 B2	04.06.2002
		JP 3193880 B2	30.07.2001
		US 05978890 A	02.11.1999
		US 06230239 B1	08.05.2001
		US 06240494 B1	29.05.2001
		US 06321292 B1	20.11.2001
		US 06374327 B2	16.04.2002
		US 06408370 B2	18.06.2002
		US 06470432 B2	22.10.2002

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2009/056530

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
		US 06615332 B2	02.09.2003
		US 06643750 B2	04.11.2003
		US 06647476 B2	11.11.2003
		US 06665781 B2	16.12.2003
		US 06681303 B1	20.01.2004
		US 06950917 B2	27.09.2005
		US 06988176 B2	17.01.2006
		US 07069403 B2	27.06.2006
		US 07082506 B2	25.07.2006
		US 07143252 B2	28.11.2006
		US 07162598 B2	09.01.2007
		US 07167962 B2	23.01.2007
		US 07191303 B2	13.03.2007
		US 07194590 B2	20.03.2007
		US 07200729 B2	03.04.2007
		US 07213114 B2	01.05.2007
		US 07216208 B2	08.05.2007
		US 07246214 B2	17.07.2007
		US 07657707 B2	02.02.2010
		US 2001-0000818 A1	03.05.2001
		US 2001-0011324 A1	02.08.2001
		US 2001-0029570 A1	11.10.2001
		US 2002-0032834 A1	14.03.2002
		US 2002-0046330 A1	18.04.2002
		US 2002-0129202 A1	12.09.2002
		US 2002-0169925 A1	14.11.2002
		US 2003-0051111 A1	13.03.2003
		US 2003-0145169 A1	31.07.2003
		US 2004-0064659 A1	01.04.2004
		US 2004-0068628 A1	08.04.2004
		US 2004-0078535 A1	22.04.2004
		US 2004-0088484 A1	06.05.2004
		US 2004-0107315 A1	03.06.2004
		US 2004-0199737 A1	07.10.2004
		US 2004-0230756 A1	18.11.2004
		US 2005-0021627 A1	27.01.2005
		US 2005-0120092 A1	02.06.2005
		US 2005-0120093 A1	02.06.2005
		US 2005-0240741 A1	27.10.2005
		US 2006-0085612 A1	20.04.2006
		US 2006-0195667 A1	31.08.2006
		US 2006-0195668 A1	31.08.2006
		US 2007-0038833 A1	15.02.2007
