

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
31 December 2008 (31.12.2008)

PCT

(10) International Publication Number
WO 2009/000639 A3

- (51) International Patent Classification:
G06F 11/10 (2006.01)
- (21) International Application Number:
PCT/EP2008/057199
- (22) International Filing Date: 10 June 2008 (10.06.2008)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
11/769,929 28 June 2007 (28.06.2007) US
- (71) Applicant (for all designated States except US): **INTERNATIONAL BUSINESS MACHINES CORPORATION** [US/US]; New Orchard Road, Armonk, New York 10504 (US).
- (71) Applicant (for MG only): **IBM UNITED KINGDOM LIMITED** [GB/GB]; PO Box 41, North Harbour, Portsmouth Hampshire PO6 3AU (GB).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): **ALVES, Luiz** [US/US]; 16 Fishkill Creek Road, Hopewell Junction, New York 12533 (US). **CLARKE, William** [US/US]; 32 Ziegler Avenue, Poughkeepsie, New York 12603

- (US). **DELL, Timothy** [US/US]; 101 Parkwood Drive, Colchester, Vermont 05446 (US). **DEWKETT, Thomas** [US/US]; 271 Browns Pond Road, Staatsburg, New York 12580 (US). **GOWER, Kevin** [US/US]; Eight Alary Road Ext., Lagrangeville, New York 12540 (US). **LASTRAS-MONTANO, Luis** [MX/US]; 240 Lafayette Avenue, Cortlandt Manor, New York 10567 (US). **O'CONNOR, James** [US/US]; Eight Russett Lane, Ulster Park, New York 12487 (US).
- (74) Agent: **LING, Christopher, John**; IBM United Kingdom Limited, Intellectual Property Law, Hursley Park, Winchester Hampshire SO21 2JN (GB).
- (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, 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, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH,

[Continued on next page]

(54) Title: SYSTEM AND METHOD FOR ERROR CORRECTION AND DETECTION IN A MEMORY SYSTEM

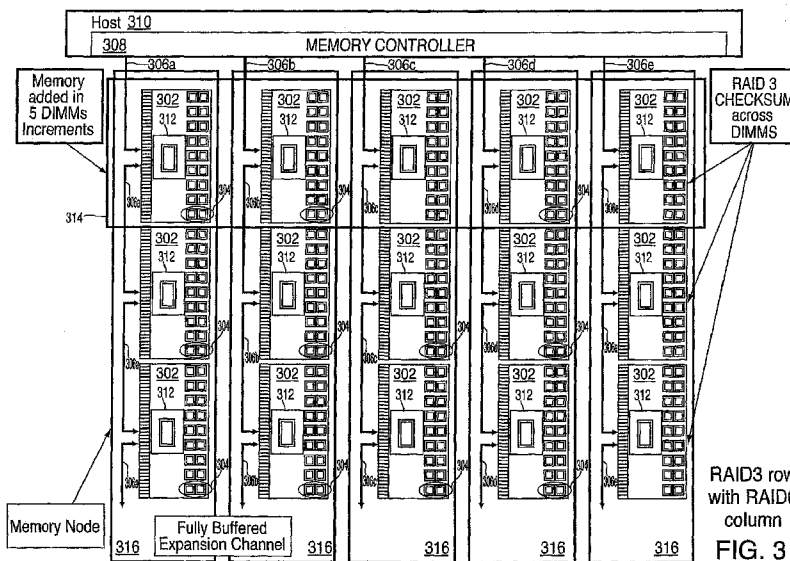


FIG. 3

(57) Abstract: A system and method for error correction and detection in a memory system. The system includes a memory controller, a plurality of memory modules and a mechanism. The memory modules are in communication with the memory controller and with a plurality of memory devices. The mechanism detects that one of the memory modules has failed possibly coincident with a memory device failure on an other of the memory modules. The mechanism allows the memory system to continue to run unimpaired in the presence of the memory module failure and the memory device failure.

WO 2009/000639 A3



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

Published:

- *with international search report*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

(88) Date of publication of the international search report:
28 May 2009

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2008/057199

A. CLASSIFICATION OF SUBJECT MATTER
INV. G06F11/10

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, WPI Data, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2007/047344 A1 (THAYER LARRY J [US] ET AL THAYER LARRY JAY [US] ET AL) 1 March 2007 (2007-03-01) abstract; figures 1,3,4 paragraph [0011] - paragraph [0013] paragraph [0018] - paragraph [0024] paragraph [0029]	1-10
A	CHEN P M ET AL: "RAID: HIGH-PERFORMANCE, RELIABLE SECONDARY STORAGE" ACM COMPUTING SURVEYS, ACM, NEW YORK, NY, US, US, vol. 26, no. 2, 1 June 1994 (1994-06-01), pages 145-185, XP000672139 ISSN: 0360-0300 abstract page 154, paragraph 3.2.4 page 155, paragraph 3.2.7	1-10

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

Date of the actual completion of the international search
12 March 2009

Date of mailing of the international search report
23/03/2009

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
Rousset, Antoine

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2008/057199

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 2006/029243 A (EXTREME NETWORKS [US]; SWENSON ERIK R [US]; EDEM BRIAN C [US]; NGUYEN) 16 March 2006 (2006-03-16) abstract; figures 1,2,4 page 1, line 14 - page 2, line 27 page 3, line 18 - page 5, line 22 page 5, line 30 - page 6, line 10 -----	1-10
Y	US 5 513 135 A (DELL TIMOTHY J [US] ET AL) 30 April 1996 (1996-04-30) cited in the application abstract -----	1-10
A	US 6 381 685 B2 (DELL TIMOTHY JAY [US] ET AL) 30 April 2002 (2002-04-30) cited in the application abstract -----	1-10

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No PCT/EP2008/057199

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2007047344 A1	01-03-2007	GB 2434226 A	18-07-2007
WO 2006029243 A	16-03-2006	EP 1792254 A1	06-06-2007
US 5513135 A	30-04-1996	NONE	
US 6381685 B2	30-04-2002	US 6173382 B1 US 2001000822 A1	09-01-2001 03-05-2001