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(72) Inventors; and

(71) Applicants : WEBBER, James [GB/GB]; 54 Crawthorpe Grove, London SE22 9AB (GB). ROBINSON, Ian, Scott [GB/GB]; 115 Herne Hill Road, London SE24 0AD (GB). LINDAAKER, Mats, Tobias [SE/SE]; Regementsgatan 98A, S-21751 Malmo (SE). JONES, Alistair Philip Campbell [GB/GB]; 20 Kerrison Road, London SW11 2QE (GB).

(74) Agent: IKEGAMI, Jon, Y.; Innovation Counsel LLP, 2880 Lakeside Drive, Suite 200, Santa Clara, CA 95054-2818 (US).

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(54) Title: METHOD AND APPARATUS FOR ENSURING CONSISTENT OUTCOMES UPDATES TO DISTRIBUTED DATABASES

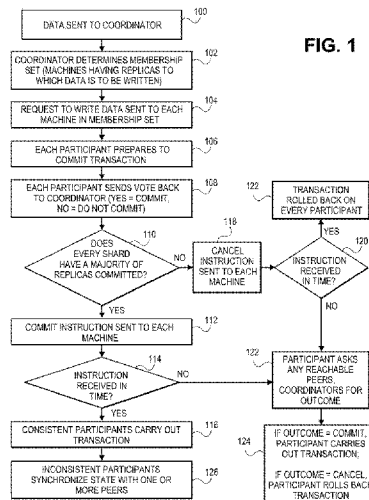


FIG. 1

(57) Abstract: Methods of conducting database transactions. One such method comprises receiving data to be written to a database; identifying a set of shard replicas corresponding to the database to which the data is to be written; transmitting, to each of the replicas in the set, a request to write the data thereto; receiving votes back from the replicas in the set each vote representing whether the respective replica commits to a writing of the data thereto; determining whether to commit to the writing of the data to the database according to whether a majority of the replicas of every shard having replicas in the set has transmitted a vote committing to the writing of the data thereto; and transmitting an outcome of the determining to each of the replicas in the set.

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## INTERNATIONAL SEARCH REPORT

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## A. CLASSIFICATION OF SUBJECT MATTER

INV. G06F17/30  
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)

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 practicable, search terms used)

EPO-Internal, WPI Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 7 653 668 B1 (SHELAT RADHA [IN] ET AL) 26 January 2010 (2010-01-26) column 2, line 18 - column 2, line 41 column 4, line 59 - column 5, line 16 column 15, line 5 - column 15, line 51 claim 1	1-14
A	----- US 6 823 355 B1 (NOVAES MARCOS N [US] ET AL) 23 November 2004 (2004-11-23) column 4, line 21 - column 5, line 25 column 9, line 1 - column 9, line 13 column 10, line 12 - column 10, line 54 ----- -/--	1-3,5,6, 8-10,12, 13

 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

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"P" document published prior to the international filing date but later than the priority date claimed

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"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

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European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040,  
Fax: (+31-70) 340-3016

Authorized officer

Targon, Valerio

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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.
A	<p>David K. Gifford: "Weighted Voting for Replicated Data",  Proceeding SOSP '79 Proceedings of the seventh ACM symposium on Operating systems principles,  31 December 1979 (1979-12-31), pages 150-162, XP055077209,  Retrieved from the Internet:  URL:<a href="http://www.cs.cmu.edu/~15-610/READINGS/required/availability/gifford79.pdf">http://www.cs.cmu.edu/~15-610/READINGS/required/availability/gifford79.pdf</a>  [retrieved on 2013-08-30]  Sections 1, 3.1 and 3.3</p> <p style="text-align: center;">-----</p>	1,5,8,12
A	<p>LESLIE LAMPART: "The part-time parliament",  ACM TRANSACTIONS ON COMPUTER SYSTEMS, vol. 16, no. 2, 1 May 1998 (1998-05-01), pages 133-169, XP055099749,  ISSN: 0734-2071, DOI:  10.1145/279227.279229  the whole document</p> <p style="text-align: center;">-----</p>	1,5,8,12

# INTERNATIONAL SEARCH REPORT

Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 7653668	B1	26-01-2010	NONE
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US 6823355	B1	23-11-2004	DE 10123067 A1 03-01-2002
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