(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization

International Bureau





(10) International Publication Number WO 2012/162171 A3

(43) International Publication Date 29 November 2012 (29.11.2012)

(51) International Patent Classification: G06F 15/16 (2006.01) G06F 9/44 (2006.01) G06F 9/06 (2006.01)

(21) International Application Number:

PCT/US2012/038647

(22) International Filing Date:

18 May 2012 (18.05.2012)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: 13/111,956

20 May 2011 (20.05.2011)

US

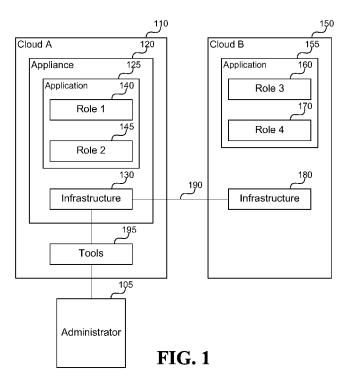
- (71) Applicant (for all designated States except US): MI-CROSOFT CORPORATION [US/US]; One Microsoft Way, Redmond, Washington 98052-6399 (US).
- (72) Inventors: IYER, Kannan C.; c/o Microsoft Corporation, LCA - International Patents, One Microsoft Way, Redmond, Washington 98052-6399 (US). WATSON, Eric B.; c/o Microsoft Corporation, LCA - International Patents, One Microsoft Way, Redmond, Washington 98052-6399 (US).
- (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, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, 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, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

 as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))

[Continued on next page]

(54) Title: CROSS-CLOUD MANAGEMENT AND TROUBLESHOOTING



(57) Abstract: A cloud management system is described herein that provides the ability for an application to span two or more clouds while allowing operation, management, and troubleshooting of the distributed application as a single application. The system provides infrastructure that communicates across datacenters for execution and for centralizing knowledge of instances of an application that are running at different locations. The infrastructure provided by the system monitors both the application and connections between the clouds, with intelligence to know if issues are within the application or because of the connection between the clouds. The system coordinates management functions across multiple cloud platforms/locations. Thus, the cloud management system creates a single monitoring and troubleshooting interface and knowledge and execution fabric across multiple clouds so that applications spread across multiple clouds can be monitored, managed, and debugged more easily.



— as to the applicant's entitlement to claim the priority of — the earlier application (Rule 4.17(iii))

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))

 $\textbf{(88)} \ \ \textbf{Date of publication of the international search report:}$

21 February 2013

International application No. **PCT/US2012/038647**

A. CLASSIFICATION OF SUBJECT MATTER

G06F 15/16(2006.01)i, G06F 9/06(2006.01)i, G06F 9/44(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)

G06F 15/16; G06F 15/173; G06F 9/455; G06F 15/177

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

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) eKOMPASS(KIPO internal) & Keywords: cross-cloud, management, data, gather, unify, location, troubleshooting, migration, application, distribution, tool, instance, request, datacenter, report

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2011-0055378 A1 (FERRIS JAMES MICHAEL et al.) 03 March 2011 See paragraphs [0015]-[0018],[0028]-[0033],[0035]-[0048],[0053]-[0059],	1,2,4,7-15
A	claims 1-5,10, and figures 1-4,6	3,5,6
A	US 2009-0300149 A1 (FERRIS JAMES MICHAEL et al.) 03 December 2009 See paragraphs [0014]-[0028],[0030]-[0039], claims 1-8, and figures 1-3,5	1-15
A	US 2010-0042720 A1 (STIENHANS FRANK et al.) 18 February 2010 See paragraphs [0018]-[0031],[0034]-[0036], claim 1, and figures 2-4	1-15
A	US 2010-0223378 A1 (WEI COACH) 02 September 2010 See paragraphs [0049]-[0057],[0080]-[0081],[0085], claims 1-9,17-21, and figures 5,6,14,15,18	1-15

	Further documents are listed in the continuation of Box C.		See patent family annex.
*	Special categories of cited documents:	"T"	later document published after the international filing date or priority
"A"	document defining the general state of the art which is not considered		date and not in conflict with the application but cited to understand
	to be of particular relevance		the principle or theory underlying the invention
"E"	earlier application or patent but published on or after the international	"X"	document of particular relevance; the claimed invention cannot be
	filing date		considered novel or cannot be considered to involve an inventive
"L"	document which may throw doubts on priority claim(s) or which is		step when the document is taken alone
	cited to establish the publication date of citation or other	"Y"	document of particular relevance; the claimed invention cannot be
	special reason (as specified)		considered to involve an inventive step when the document is
"O"	document referring to an oral disclosure, use, exhibition or other		combined with one or more other such documents, such combination
	means		being obvious to a person skilled in the art
"P"	document published prior to the international filing date but later	"&"	document member of the same patent family
	than the priority date claimed		

Date of the actual completion of the international search

26 DECEMBER 2012 (26.12.2012)

Date of mailing of the international search report

27 DECEMBER 2012 (27.12.2012)

Name and mailing address of the ISA/KR



Korean Intellectual Property Office 189 Cheongsa-ro, Seo-gu, Daejeon Metropolitan City, 302-701, Republic of Korea

Facsimile No. 82-42-472-7140

Authorized officer

Yoon Young Jin

Telephone No. 82-42-481-8533



INTERNATIONAL SEARCH REPORT

International application No.

Information on patent family members			PCT/US2012/038647	
Patent document cited in search report	Publication date	Patent family member(s)	Publication date	
US 2011-0055378 A1	03.03.2011	None		
US 2009-0300149 A1	03.12.2009	None		
US 2010-0042720 A1	18.02.2010	None		
US 2010-0223378 A1	02.09.2010	AU 2010-217917 A1 AU 2010-234958 A1 CN 102439913 A EP 2401841 A2 EP 2401844 A2 US 2010-0220622 A1 US 2010-0251329 A1 US 8209415 B2 W0 2010-099367 A2 W0 2010-099513 A2 W0 2010-099513 A3 W0 2010-099514 A3 W0 2010-099514 A3 W0 2010-099514 A3 W0 2010-117623 A2 W0 2010-117623 A3	02.09.2010 14.10.2010 02.05.2012 04.01.2012 04.01.2012 02.09.2010 02.09.2010 02.09.2010 02.09.2010 02.09.2010 02.09.2010 02.09.2010 02.09.2010 04.01.2011 04.10.2010 14.10.2010	