



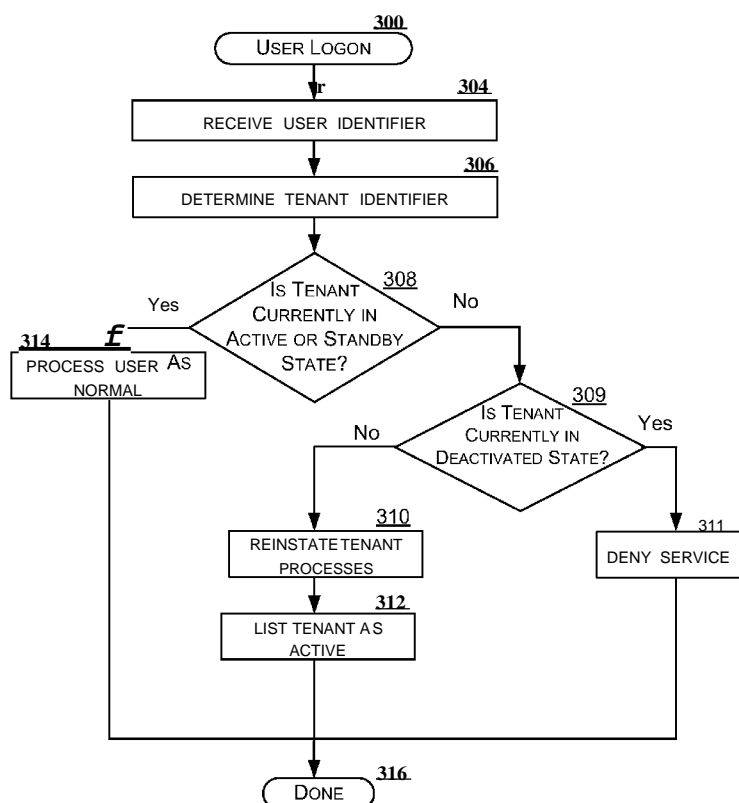
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- (81) **Designated States (unless otherwise indicated, for every kind of national protection available):** AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM,

[Continued on nextpage]

- (54) **Title:** MANAGING CAPACITY IN A DATA CENTER BY SUSPENDING TENANTS



**FIG. 3A**

(57) **Abstract:** A tenant comprising one or more users receives services from a cloud computing system ("CCS"). The CCS determines when a tenant is not using any services, and if so, the CCS initiates a tenant suspension process. The tenant suspension process involves suspending various asynchronous computing processes for the tenant, which execute otherwise execute even if no users of the tenant are currently accessing the CCS. After a period of non-use of the CCS, the tenant is suspended. The tenant is returned to an active state automatically when a user of the tenant logs-on to receive services.

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, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) **Designated States** (unless otherwise indicated, for every *Mnd 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 4.1 7(H))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.1 7(ii))*

**Published:**

- *with international search report (Art. 21(3))*
- *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))*

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

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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2012/064007

**A. CLASSIFICATION OF SUBJECT MATTER****G06F 17/00(2006.01)i, G06F 15/16(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)

G06F 17/00; G06F 12/16; G06F 1/26; G06F 1/00; G06F 9/455; G06F 1/32

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) &amp; Keywords: cloud, resource, suspend, active, resume, tenant, 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 2009-0293056 AI (FERRIS, JAMES MICHAEL) 26 November 2009 See paragraphs [0013H0017], [0024], [0040], [0043]-[0047] and [0051]; and figures 1-2.	1-6, 8-10
A		7
A	US 2009-0288084 AI (ASTETE, NICHOLAS LUIS et al.) 19 November 2009 See paragraphs [0030H0039] and [0114]-[0117]; and figures 1-3.	1-10
A	US 2011-0231680 AI (PADMANABHAN, VENKATA N. et al.) 22 September 2011 See paragraphs [0003], [0029H0030], and [0054]; and figures 1-2.	1-10
A	US 2011-0185208 AI (IWAMOTO, DEREK et al.) 28 July 2011 See paragraphs [0004], [0022], and [0026]; and figures 1-2.	1-10
A	US 2011-0161696 AI (FLETCHER, JAMES C.) 30 June 2011 See paragraphs [0003] and [0012H0016]; figures 1-4.	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

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"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

"&amp;" document member of the same patent family

Date of the actual completion of the international search

03 May 2013 (03.05.2013)

Date of mailing of the international search report

**07 May 2013 (07.05.2013)**

Name and mailing address of the ISA/KR

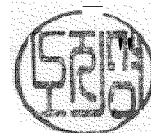
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**INTERNATIONAL SEARCH REPORT**

Information on patent family members

International application No.

**PCT/US2012/064007**

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