PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 :
G06F 9/46, 17/30

A3

(11) International Publication Number: **WO 99/44133**

(43) International Publication Date: 2 September 1999 (02.09.99)

(21) International Application Number: PCT/US99/04065

(22) International Filing Date: 25 February 1999 (25.02.99)

(30) Priority Data:

60/076,048	26 February 1998 (26.02.98)	US
09/045,652	20 March 1998 (20.03.98)	US

(71) Applicant: SUN MICROSYSTEMS, INC. [US/US]; 901 San Antonio Road, MS UPAL01-521, Palo Alto, CA 94303 (US).

(72) Inventors: SCHEIFLER, Robert; 96 North Street, Somerville, MA 02144 (US). WOLLRATH, Ann, M.; 9 Northwoods Road, Groton, MA 01450 (US). JONES, Peter, C.; 85 Bacon Street, Winchester, MA 01890 (US).

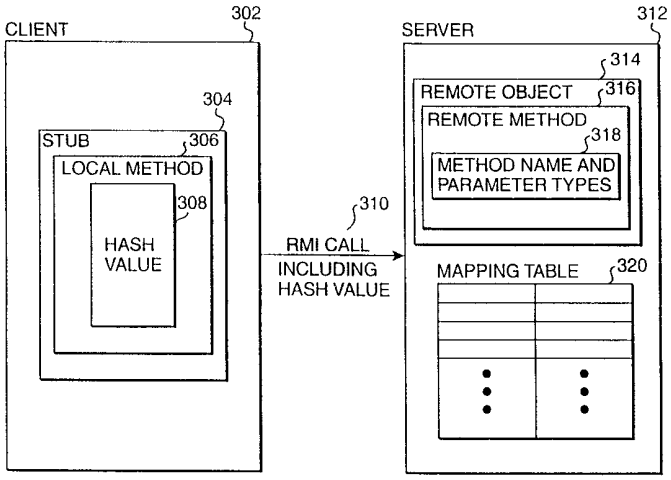
(74) Agents: GARRETT, Arthur, S.; Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P., 1300 I Street, N.W., Washington, DC 20005-3315 (US) et al.

(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, 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 the receipt of amendments.

(88) Date of publication of the international search report:
28 October 1999 (28.10.99)

(54) Title: METHOD AND SYSTEM FOR DETERMINISTIC HASHES TO IDENTIFY REMOTE METHODS



(57) Abstract

A method and system is provided to uniquely identify a remote method to invoke on a server using a hash value computed from the method signature sent from the client to the server with the call request. When a client wishes to invoke a remote method located on a server, the client sends a hash value identifying the remote method to the server in the "remote method invocation" (RMI) call. In one implementation, this hash value is created by applying a hash function to the method string name and the parameter type list and possibly the return type. When the server receives the RMI call, the server identifies which method is being called using the received hash value. The server maintains a mapping of hash values to their associated remote methods located on the server and references the correct method using the hash value. Additionally, in one implementation, the server creates the mapping table dynamically when a remote object is created. The server identifies the methods implemented by the object and creates hash values for each method. These hash values are stored in a mapping table which is used to reference the remote methods.

FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	**ES**	Spain	**LS**	Lesotho	**SI**	Slovenia
AM	Armenia	**FI**	Finland	**LT**	Lithuania	**SK**	Slovakia
AT	Austria	**FR**	France	**LU**	Luxembourg	**SN**	Senegal
AU	Australia	**GA**	Gabon	**LV**	Latvia	**SZ**	Swaziland
AZ	Azerbaijan	**GB**	United Kingdom	**MC**	Monaco	**TD**	Chad
BA	Bosnia and Herzegovina	**GE**	Georgia	**MD**	Republic of Moldova	**TG**	Togo
BB	Barbados	**GH**	Ghana	**MG**	Madagascar	**TJ**	Tajikistan
BE	Belgium	**GN**	Guinea	**MK**	The former Yugoslav Republic of Macedonia	**TM**	Turkmenistan
BF	Burkina Faso	**GR**	Greece			**TR**	Turkey
BG	Bulgaria	**HU**	Hungary	**ML**	Mali	**TT**	Trinidad and Tobago
BJ	Benin	**IE**	Ireland	**MN**	Mongolia	**UA**	Ukraine
BR	Brazil	**IL**	Israel	**MR**	Mauritania	**UG**	Uganda
BY	Belarus	**IS**	Iceland	**MW**	Malawi	**US**	United States of America
CA	Canada	**IT**	Italy	**MX**	Mexico	**UZ**	Uzbekistan
CF	Central African Republic	**JP**	Japan	**NE**	Niger	**VN**	Viet Nam
CG	Congo	**KE**	Kenya	**NL**	Netherlands	**YU**	Yugoslavia
CH	Switzerland	**KG**	Kyrgyzstan	**NO**	Norway	**ZW**	Zimbabwe
CI	Côte d'Ivoire	**KP**	Democratic People's Republic of Korea	**NZ**	New Zealand		
CM	Cameroon			**PL**	Poland		
CN	China	**KR**	Republic of Korea	**PT**	Portugal		
CU	Cuba	**KZ**	Kazakstan	**RO**	Romania		
CZ	Czech Republic	**LC**	Saint Lucia	**RU**	Russian Federation		
DE	Germany	**LI**	Liechtenstein	**SD**	Sudan		
DK	Denmark	**LK**	Sri Lanka	**SE**	Sweden		
EE	Estonia	**LR**	Liberia	**SG**	Singapore		

INTERNATIONAL SEARCH REPORT

Interr nal Application No
PCT/US 99/04065

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 G06F9/46 G06F17/30

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 6 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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	US 5 640 564 A (HAMILTON GRAHAM ET AL) 17 June 1997 (1997-06-17) column 2, line 50 - column 3, line 45 column 6, line 18 - column 9, line 14	1-14, 18-23,25 15-17,24
X Y A	EP 0 794 493 A (DIGITAL VISION LAB CORP) 10 September 1997 (1997-09-10) column 10, line 32 - column 14, line 57	1 15-17,24 2-14, 18-23,25
X A	EP 0 803 810 A (SUN MICROSYSTEMS INC) 29 October 1997 (1997-10-29) claims 1-5 column 6, line 7 - line 19	1 2-25

-/--

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in 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.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
20 August 1999	30/08/1999

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Bijn, K

2

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Inter nal Application No
PCT/US 99/04065

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
A	"RETRIEVAL OF QUALIFIED VARIABLES USING EXTENDIBLE HASHING" IBM TECHNICAL DISCLOSURE BULLETIN, vol. 36, no. 12, 1 December 1993 (1993-12-01), pages 301-303, XP000418976 ISSN: 0018-8689 the whole document	15-17,24
X	EP 0 474 340 A (DIGITAL EQUIPMENT CORP) 11 March 1992 (1992-03-11)	1
A	column 3, line 11 - column 4, line 42 column 13, line 32 - column 14, line 50	2-25
A	"OBJECT LOCATION ALGORITHM" IBM TECHNICAL DISCLOSURE BULLETIN, vol. 36, no. 9B, 1 September 1993 (1993-09-01), page 257/258 XP002045269 ISSN: 0018-8689 the whole document	1-25

2

Form PCT/ISA/210 (continuation of second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

Information on patent family members

Interr: ıal Application No
PCT/US 99/04065

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5640564 A	17-06-1997	EP 0684553 A	29-11-1995
		JP 7325790 A	12-12-1995
EP 0794493 A	10-09-1997	JP 9245003 A	19-09-1997
		JP 10124319 A	15-05-1998
		JP 10124423 A	15-05-1998
		JP 10187468 A	21-07-1998
		CA 2199108 A	05-09-1997
		CN 1165343 A	19-11-1997
EP 0803810 A	29-10-1997	US 5815709 A	29-09-1998
		JP 10083299 A	31-03-1998
EP 0474340 A	11-03-1992	AU 639802 B	05-08-1993
		AU 7945491 A	26-03-1992
		CA 2049121 A,C	15-02-1992
		DE 69131245 D	24-06-1999
		JP 2011115 C	02-02-1996
		JP 6075888 A	18-03-1994
		JP 7043686 B	15-05-1995
		US 5341478 A	23-08-1994