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

(19) World Intellectual Property
Organization
International Bureau

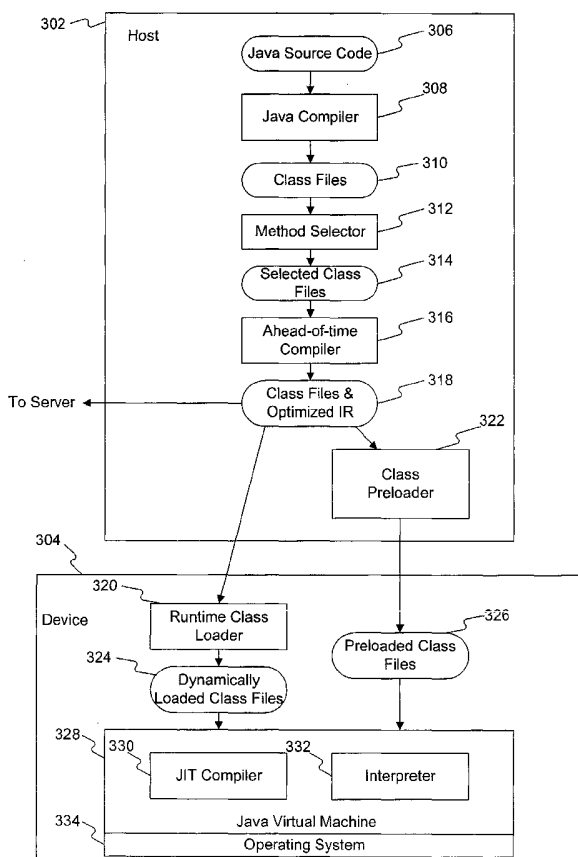(43) International Publication Date
17 April 2003 (17.04.2003)

PCT

(10) International Publication Number
WO 2003/032155 A3

(54) Title: PLATFORM-INDEPENDENT SELECTIVE AHEAD-OF-TIME COMPILATION

(57) Abstract: Methods and systems for platform-inde-
pendent selective ahead-of-time compilation are herein
described. A method selector comprising a profiling tool
and heuristic selects a subset of methods for ahead-of-time
compilation. The profiling tool ranks a set of methods
according to predetermined criteria, and the heuristic
identifies the subset of methods from the set of methods.
An ahead-of-time compiler comprises a first unit and a
second unit. The first unit converts, for each selected
method, bytecodes corresponding to the selected method
to a platform-independent intermediate representation. The
second unit optimizes the platform-independent intermediate
representation of each selected method, wherein each
optimized intermediate representation is stored with a
corresponding selected method. A virtual machine on a
device converts an optimized intermediate representation
associated with a selected method loaded onto the device to
platform-dependent machine code.

WO 2003/032155 A3

INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7   G06F9/45

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 7   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, PAJ, INSPEC, COMPENDEX

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	EP 0 943 990 A (TEXAS INSTRUMENTS INC) 22 September 1999 (1999-09-22) page 3, line 19 - line 23 page 6, line 10 - line 12 page 6, line 15 - line 17 figure 1	1-66
Y	KASTNER W ET AL: "A new approach for Java in embedded networks" FACTORY COMMUNICATION SYSTEMS, 2000. PROCEEDINGS. 2000 IEEE INTERNATIONAL WORKSHOP ON PORTO, PORTUGAL 6-8 SEPT. 2000, PISCATAWAY, NJ, USA,IEEE, US, 6 September 2000 (2000-09-06), pages 19-26, XP010521791 ISBN: 0-7803-6500-3 page 24, right-hand column, line 21 -page 25, left-hand column, line 41	1-66

-/--

| 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
11 March 2004	31/03/2004

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	del Chiaro, S

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

page 1 of 2

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication,where appropriate, of the relevant passages	Relevant to claim No.
A	HSIEH C-H A ET AL: "Java bytecode to native code translation: the Caffeine prototype and preliminary results" PROCEEDINGS OF THE 29TH. ANNUAL IEEE/ACM INTERNATIONAL SYMPOSIUM ON MICROARCHITECTURE. MICRO-29. PARIS, DEC. 2 - 4, 1996, PROCEEDINGS OF THE ANNUAL IEEE/ACM INTERNATIONAL SYMPOSIUM ON MICROARCHITECTURE. (MICRO), LOS ALAMITOS, IEEE COMP. SOC. PRESS, U, vol. SYMP. 29, 2 December 1996 (1996-12-02), pages 90-97, XP010206088 ISBN: 0-8186-7641-8 page 91, right-hand column, line 18 - line 60 figure 1	1,2,16, 30-32, 34,45, 49,50, 59,65,66
A	ARNOLD M., HIND M., RYDER B.G.: "An Empirical Study of Selective Optimization" PROCEEDINGS OF THE INTERNATIONAL WORKSHOP OB LANGUAGES AND COMPILER FOR PARALLEL COMPUTING LCPC, 'Online! August 2000 (2000-08), XP002273265 Retrieved from the Internet: <URL:http://www.prolangs.rutgers.edu/refs/ docs/lcpc00.ps> 'retrieved on 2004-03-11! page 1, line 7 - line 9 page 6, line 42 - line 44	1,2,16, 30-32, 34,45, 49,50, 59,65,66

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

Patent document cited in search report		Publication date	Patent family member(s)		Publication date
EP 0943990	A	22-09-1999	EP	0943990 A2	22-09-1999
			JP	11296380 A	29-10-1999
			US	6412107 B1	25-06-2002