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[Continued on next page]

(54) **Title:** METHOD, SYSTEM AND APPARATUS FOR REMOTE SOFTWARE UPGRADE OF AN EMBEDDED DEVICE

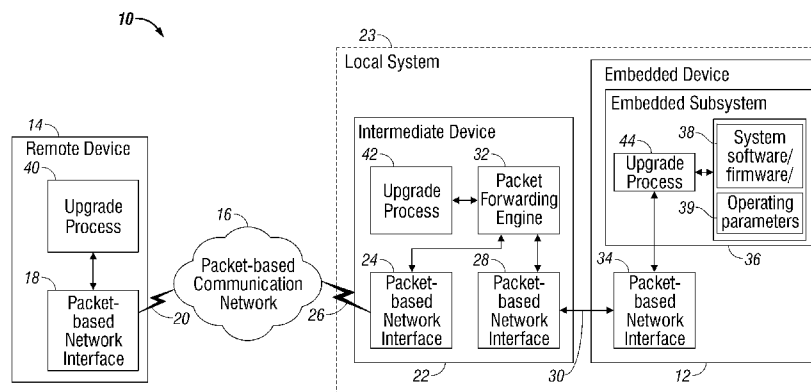


FIG. 1

(57) **Abstract:** A system, method and apparatus for remote software upgrade of an embedded device supporting packet-based communication. A packet-based communication path is provided between a remote device and the embedded device. An intermediate device is placed in the packet-based communication path as a local node directly coupled to the embedded device. The intermediate device includes packet forwarding means for carrying out normal communication between the remote device and the embedded device. The software of the embedded device is upgraded by i) transferring software upgrade data from the remote device to the intermediate device, ii) transferring the software upgrade data from the intermediate device to the embedded device, and iii) carrying out an upgrade process on the embedded device that loads the software upgrade data on the embedded device.

WO 2009/107000 A3



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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER INV. H04L29/08 G06F9/445		
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) H04L 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		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 1 170 660 A (MARCONI COMMERCE SYS INC [US]) 9 January 2002 (2002-01-09) figure 4 paragraph [0001] - paragraph [0002] paragraph [0021] paragraph [0023] paragraph [0028] paragraph [0035] paragraph [0037] paragraph [0040]	1-3,6,7, 11-16, 19, 22-25, 28, 32-37, 40,41, 44-47, 52-54
Y	-/--	4,5,26, 27,48,49
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.		
<input checked="" type="checkbox"/> 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 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. *Z* document member of the same patent family	
Date of the actual completion of the international search <p style="text-align: center; font-weight: bold;">24 June 2009</p>	Date of mailing of the international search report <p style="text-align: center; font-weight: bold;">14/09/2009</p>	
Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer <p style="text-align: center; font-weight: bold;">Suciu, Radu</p>	

INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2009/050077

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	----- US 2008/007120 A1 (WEYL DANIEL [DE] ET AL) 10 January 2008 (2008-01-10) paragraph [0010] paragraph [0017]	1-3,6,7, 11-16, 19, 22-25, 28, 32-37, 40,41, 44-47, 52-54
Y	----- US 2001/049263 A1 (ZHANG XIANG [US]) 6 December 2001 (2001-12-06) paragraph [0014] -----	4,5,26, 27,48,49

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2009/050077

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this international search report covers allsearchable claims.

2. As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.

3. As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

1-7, 11-16, 19, 22-28, 32-37, 40-41, 44-49, 52-54

Remark on Protest

- The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-7, 11-16,19,22-28,32-37,40-41,44-49,52-54

Method, system and apparatus for performing verification of reassembled software data

2. claims: 8-10,17-18,29-31,38-39,50-51

Method, system and apparatus backing up software

3. claims: 20-21,42-43,55

Method, system and apparatus suspending normal communication between a remote device and an embedded device while upgrading the software on the embedded device

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IB2009/050077

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 1170660	A	09-01-2002	NONE
US 2008007120	A1	10-01-2008	CN 101080697 A 28-11-2007 EP 1828890 A1 05-09-2007 WO 2006063602 A1 22-06-2006 JP 2008523744 T 03-07-2008
US 2001049263	A1	06-12-2001	NONE