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**Datasheet for the decision  
of 29 July 2014**

**Case Number:** T 2072/09 - 3.5.06

**Application Number:** 00946726.7

**Publication Number:** 1257915

**IPC:** G06F9/445

**Language of the proceedings:** EN

**Title of invention:**

METHOD AND APPARATUS FOR UPGRADING FIRMWARE IN AN EMBEDDED SYSTEM

**Applicant:**

Axis AB

**Headword:**

Firmware upgrade/AXIS

**Relevant legal provisions:**

EPC 1973 Art. 56  
EPC Art. 84, 123(2)  
EPC R. 42(1)(b), 42(1)(c), 46(2)(i)

**Keyword:**

Inventive step - (yes)

**Decisions cited:**

**Catchword:**



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Case Number: T 2072/09 - 3.5.06

**D E C I S I O N**  
**of Technical Board of Appeal 3.5.06**  
**of 29 July 2014**

**Appellant:** Axis AB  
(Applicant) Endalavägen 14  
223 69 Lund (SE)

**Representative:** Ahlberg, Lena Camilla  
Awapatent AB  
Box 1066  
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**Decision under appeal:** **Decision of the Examining Division of the  
European Patent Office posted on 19 May 2009  
refusing European patent application No.  
00946726.7 pursuant to Article 97(2) EPC.**

**Composition of the Board:**

**Chairman:** D. Rees  
**Members:** G. Zucka  
M.-B. Tardo-Dino

## Summary of Facts and Submissions

I. The appeal is against the decision by the examining division, with reasons dispatched on 19 May 2009, to refuse European patent application 00 946 726.7, on the basis that the subject-matter of all the claims was not inventive, Article 56 EPC 1973. The following documents were cited in the appealed decision:

D1 = US 5 812 857 A

D2 = Osadzinski A., "The Network File System (NFS)",  
Computer Standards & Interfaces 8 (1988/89) No. 1,  
Amsterdam, The Netherlands, XP 000051969

D3 = WO 96/32679 A

D4 = US 5 887 164 A

II. A notice of appeal was received on 16 July 2009, the appeal fee being paid on the same day. A statement of the grounds of the appeal was received on 29 September 2009.

III. The appellant requested that the decision under appeal be set aside and a patent granted on the basis of the claims labelled "Main request" or "Auxiliary request" filed with the grounds of appeal. The further text on file is:

Description pages 1 to 10 as filed

Drawing sheets 1 to 4 as filed

The appellant made a conditional request for oral proceedings.

IV. The independent claim 1 of the main request reads as follows:

A method for upgrading firmware of an embedded system (110) over a network connection, comprising the steps of:

sharing a virtual file system (122) of the embedded system (110) with a client computer (10) via the network connection in such a way that the virtual file system (122) can be utilised by the operating system of the client computer (10) as if it was part of the file system of the client computer (10),

receiving (406) data of a firmware upgrade file in a directory for upgrading (126) at the virtual file system (122) of the embedded system (110) via the network connection, said directory for upgrading (126) being associated with a data channel (128) being a control means,

performing control operations by means of the data channel (128) on the data of the firmware upgrade file received in the directory for upgrading (126),

storing (406) the data of the firmware upgrade file in a volatile memory (150) of the embedded system (110) connected to the virtual file system (122), and writing (424) the firmware upgrade file from the volatile memory (150) to a persistent memory (160) of the embedded system (110).

The independent claim 14 of the main request reads as follows:

An embedded system (110) comprising:  
a volatile memory (150),  
a persistent memory (160),  
a protocol stack (180) for communication over a network (30),

means for upgrading firmware received over a network (30), and  
means for writing the firmware upgrade file from the volatile memory to the persistent memory, said embedded system is characterised by:  
a virtual file system (122) being shareable with an operating system of a client computer (10) via the network (30) and being connected to the volatile memory (150),  
a directory for upgrading being included in said virtual file system, and  
a data channel associated with said directory for upgrading, the data channel being a control means arranged to handle data of a firmware upgrade file sent to the directory for upgrading, and arranged to perform control operations on the data of the firmware upgrade file received.

## **Reasons for the Decision**

### *1. The admissibility of the appeal*

In view of the facts set out at points I and II above, the appeal is admissible, since it complies with the EPC formal admissibility requirements.

### *2. Inventive step; Article 56 EPC 1973*

2.1 The board considers that D3 represents the closest prior art. As pointed out in the reasons for the

appealed decision, section 11.1, and as implicitly agreed by the appellant, D3 discloses a method for upgrading firmware of an embedded system over a network connection (see D3, page 1, lines 5 to 6), comprising the steps of:

receiving data of a firmware upgrade file ("patch file") via the network connection (figure 1: communication network 12),  
storing the data of the firmware upgrade file in a volatile memory of the embedded system (page 14, lines 1 to 2 and page 23, lines 26 to 28), and writing the firmware upgrade file from the volatile memory to a persistent memory of the embedded system (page 14, lines 3 to 5 and page 22, lines 24 to 28).

2.2 As acknowledged in the appealed decision, Reasons 11.2, D3 does not disclose a virtual file system. In fact, the board considers that, whilst it is true that the patch information in D3 is stored in a file (which is called "patch file" throughout D3), D3 does not disclose any kind of file system. The single patch file could very well exist independently of a file system. Therefore, even if the skilled person wanted to solve the problem mentioned in Reasons 11.3 of the appealed decision, *i.e.* to facilitate data transfer, the absence of a file system in the mobile device of D3 would not allow him or her to solve the problem in a straightforward manner by having the client computer use the file system of the mobile device as if it was part of its own file system.

2.3 It may be true, as was part of the argument in the appealed decision, Reasons 11.4, that the combined disclosure of documents D3 and D4 contains all the features of claim 1. However, given that, as pointed

out above, D3 does not use or at least does not disclose the use of a file system, there is no apparent incentive for the skilled person to apply the concept of a shared file system disclosed in D4 to the method of D3. Furthermore, in D4 it is the embedded system (target computer) which uses an image of a disk drive stored on the host computer as if it were a disk drive on the target computer (see D4, figure 1 and corresponding part of the description). In the present claim 1, apart from the fact that no disk image but a virtual file system is used, the situation is reversed, i.e. it is the client computer which uses the virtual file system of the embedded system as if it were part of its own file system.

2.4 It is further argued in the appealed decision, Reasons 11.4, penultimate sentence, that document D2 demonstrates that shared file systems were well known since the 1980's as a standard way of transferring data between computers. The board acknowledges that this may well be the case. However, it would remain necessary to demonstrate that the skilled not only *could* but *would* apply such a technique in the context of D3. No such demonstration was provided in the appealed decision and the board fails to see a reason why the skilled person would proceed in this manner.

2.5 The appellant alleged (in section 2.3.1.1 of the grounds for the appeal) that further differences exist between the subject-matter of claim 1 and the disclosure of D3. In view of the above, the board does not consider it necessary to analyse all of these alleged differences, except possibly for the feature that relates to the "directory for upgrading".

According to Reasons 11.1 of the appealed decision, the RAM holding the patch information in D3 corresponds to the "directory for upgrading" of the present claim 1. No attempt is however made in the decision to demonstrate this statement. In particular, no attempt is made to demonstrate that D3 discloses a "file directory" in the standard sense of this term.

The board considers that the existence of the "patch file" in D3 does not automatically imply the existence of a directory. In fact, since the patch file is the only file used in the mobile device of D3, there is no need for a directory. Given that a skilled person would naturally try to economise memory in a mobile device, as well as avoid the introduction of features that have no benefit but would only complicate the device and increase the risk of failure, he or she would have no incentive to implement any kind of directory in the device of D3.

*A fortiori*, D3 does not disclose or render obvious the use of a "directory for upgrading".

- 2.6 In view of the above the board considers that the skilled person, starting from the teaching of D3, would not arrive at the subject-matter of claim 1 without demonstrating inventive activity.

The subject-matter of claim 1 and, for similar reasons, claim 14 of the main request is therefore considered inventive; Article 56 EPC 1973.

3. *Other issues*

- 3.1 During the examination procedure the examining division did not raise any objections under other articles of



the EPC which remained relevant to the claims refused, nor are there any apparent to the board for the present claims. It is noted that in claim 14, "is characterised" should be "**being** characterised"; however this does not give rise to an objection under Article 84 EPC since it is an obvious linguistic error, the correction of which is immediately evident, which may be corrected under Rule 139 EPC.

3.2 The description should be adapted to the current claims (Article 84 and Rule 42(1)(c) EPC) and the prior art should be acknowledged (Rule 42(1)(b) EPC).

3.3 The reference signs 130, 131, 132 and 133, mentioned on page 8, lines 6 to 20 of the description, as well as in the claims, do not appear in the figures, contrary to Rule 46(2)(i) EPC.

3.4 The bottom of page 4 of the figures, *i.e.* the bottom of the part of the flow chart that is designated by the reference number 424, is obviously missing. This error can be corrected without infringing Article 123(2) EPC on the basis of page 10, last paragraph of the description.

## **Order**

### **For these reasons it is decided that:**

1. The appealed decision is set aside.
2. The case is remitted to the first instance with the order to grant a patent on the basis of the main request, with description and possibly figures to be amended.

The Registrar:

The Chairman:



B. Atienza Vivancos

D. Rees

Decision electronically authenticated