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**Datasheet for the decision
of 6 July 2007**

Case Number: T 0629/05 - 3.5.01

Application Number: 97116587.3

Publication Number: 0853281

IPC: G06F 3/06

Language of the proceedings: EN

Title of invention:

Raid apparatus and access control method therefor

Applicant:

FUJITSU LIMITED

Opponent:

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Headword:

RAID apparatus/FUJITSU

Relevant legal provisions:

EPC Art. 83

Keyword:

"Sufficiency of disclosure - yes"

Decisions cited:

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Catchword:

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Case Number: T 0629/05 - 3.5.01

D E C I S I O N
of the Technical Board of Appeal 3.5.01
of 6 July 2007

Appellant: FUJITSU LIMITED
1-1, Kamikodanaka 4-chome,
Nakahara-ku
Kawasaki-shi
Kanagawa 211-8588 (JP)

Representative: Seeger, Wolfgang
Georg-Hager-Straße 40
D-81369 München (DE)

Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 3 November 2004
refusing European application No. 97116587.3
pursuant to Article 97(1) EPC.

Composition of the Board:

Chairman: S. Steinbrener
Members: W. Chandler
G. Weiss

Summary of Facts and Submissions

- I. This appeal is against the decision of the examining division to refuse the application on the ground that the application as filed did not disclose the invention in a manner sufficiently clear and complete for it to be carried out by a person skilled in the art (Article 83 EPC).
- II. In the grounds of appeal, the appellant contested the division's reasoning.
- III. In the communication accompanying the summons to oral proceedings, the Board summarised the issues to be discussed, in particular that of Article 83 EPC and expressed some doubts about the admissibility under Article 123(2) EPC of the amendment to define a "read-access".
- IV. In the response to the communication, the appellant specified various requests comprising amended versions of the refused request, the originally filed claims and amended versions thereof, and submitted an extract from "The RAIDBook - A Source Book for RAID Technology", published before the priority date of the application as evidence of how RAID Level 1 worked.
- V. At the oral proceedings, the appellant requested that the decision under appeal be set aside and that a patent be granted on the basis of claims 1 to 8, submitted during the oral proceedings. At the end of the oral proceedings, the Chairman announced the decision.

VI. Claim 1 of the main request reads as follows:

"A RAID apparatus comprising
a plurality of mirrored physical disk units (11-0, 11-2;
11-1, 11-3) to which logical volumes (LMO; LM1) are
allocated; and
a disk controller (10) for accessing any physical disk
unit which forms a designated logical volume to thereby
access said designated logical volume,
said disk controller including;
a memory storing the number of operations requested to
each physical disk unit, for each physical disk unit,
and
control means for accessing one of said plurality of
physical disk units which form the designated logical
volume, having a minimum of said number of operations,
characterized in that said memory stores a table
indicating a plurality of physical disk units
corresponding to each of said logical volume and status
information indicating statuses of said physical disk
units; and
said control means refers to said memory with said
designated logical volume, and selects said single
physical disk unit on which said designated logical
volume is allocated, having said minimum number of
operations if said status information indicates that
said single physical disk unit is normal."

Method claim 5 essentially corresponds to apparatus
claim 1.

VII. The appellant argued essentially as follows:

The application focussed on load balancing in a RAID system. The excerpt from the RAID book showed at page 52, last paragraph, that load balancing applied only to read requests or accesses.

Moreover, the application as filed at page 13, line 24 to page 14, line 6 stated that at the end of a write data transfer from the channel adapter, i.e. a write access, data in the main storage was written to the pair of magnetic disk units.

Hence, it was entirely clear to the skilled person that the claimed subject-matter applied to read accesses only.

Reasons for the Decision

1. The application relates to a RAID (Redundant Array of Inexpensive Disks) system. It is common ground (see e.g. appellant's extract from the RAID book) that the RAID Level 1, or disk mirroring (now expressly referred to in the claims), protects against disk failure by replicating all data stored on the virtual disk (logical volume) on at least two physical disks. Whatever is written to the first disk is simultaneously copied onto the other(s). If one drive should fail, the other(s) will still have the data.
2. The invention improves the load balancing in a RAID system by ensuring that when the computer requests access to data on a logical volume (Figure 6, step S5),

- the corresponding physical disk is selected that has the fewest number of operations pending (Figure 7). This balances the load between the disks and improves the access speed (original page 21, lines 7 to 19).
3. It is common ground that this load balancing procedure should only apply to read accesses or else the invention will not work (see decision, points 3, and 3.2). However, the examining division stated that the explanation of the load balancing procedure in the application did not distinguish at all between read and write accesses, but merely referred to access operations (e.g. in step S5 of Figure 6, which initiated the load balancing shown in Figure 7). Thus, the balancing would have also been applied to the write processes resulting in write accesses to individual disks. This was contrary to the idea of RAID 1 since the mirrored disks would not have contained the same data. As a result, the behaviour of the system would have been erratic so that it could not have been used for any practical purpose at all. Consequently, the examining division decided that the invention was not sufficiently disclosed (Article 83 EPC).
 4. However, the Board cannot agree with the logic of this argument. The examining division appear to have applied a standard of disclosure required by amendments under Article 123(2) EPC, namely that of being directly and unambiguously derivable. However, in the case of sufficiency, the question is rather whether the disclosure is "sufficiently clear and complete for it to be carried out by a person skilled in the art", as Article 83 EPC puts it. For the purposes of Article 83 EPC, the skilled person may use common general

knowledge to supplement the information contained in the application, and may even recognise and rectify errors in the description on the basis of such knowledge (see decisions cited in "Case Law of the Boards of Appeal of the European Patent Office", 5th edition 2006, European Patent Office 2006, section II.A.2). The criterion is rather that it must be possible to reproduce the invention on the basis of the original application documents without any inventive effort and undue burden. In the present case, if, as the examining division acknowledged, it was "obviously" a central requirement in a RAID 1 system that write operations must be performed on all mirrored disks, the Board judges that the skilled person would have immediately recognised that the load balancing cannot be meant to apply to the write access.

5. Moreover, the Board considers that this interpretation is in line with the original disclosure. In particular, the passage at page 13, line 24 to page 14, line 6 cited by the appellant states that at the end of a write data transfer from the channel adapter, i.e. a write access, data in the main storage is written to the pair of magnetic disk units. This is the step "Write Back" at the bottom right of Figure 6 in connection with step S8 and it is the only place that a write is explicitly mentioned. Thus, it would not appear to make sense to have an additional write operation in connection with the device access request from the channel adapter at step S5.
6. Accordingly, the Board judges that the application does disclose the invention in a manner sufficiently clear

and complete for it to be carried out by a person skilled in the art (Article 83 EPC).

7. The Board considers that claims 1 and 5, by mentioning only "accessing" of the physical disks, are also not objectionable under this ground.
8. The appellant has amended claims 1 and 5, not only to contain the feature of accessing the physical disk with the least load, but also to define that this is done only if the disk is operating normally. The Board is satisfied that these amendments are clear and supported by the original application, in particular Figure 7 and the associated text (Articles 84 and 123(2) EPC).
9. However, the Board notes that the examining division has never commented on the novelty and inventive step of any of the subject-matter in the present application. The Board considers that such a full examination in the light of the available prior art, including the RAID book cited by the appellant in these proceedings, is more appropriately done by the examining division. The Board accordingly remits the case to the examining division (Article 111(1) EPC). The dependent claims and the description must be brought into conformity with any allowable independent claims.

Order

For these reasons it is decided that:

1. The decision under appeal is set aside.
2. The case is remitted to the department of first instance for further prosecution.

The Registrar:

The Chairman:

T. Buschek

S. Steinbrener