

Internal distribution code:

- (A) Publication in OJ
(B) To Chairmen and Members
(C) To Chairmen
(D) No distribution

**Datasheet for the decision
of 20 February 2009**

Case Number: T 1048/06 - 3.5.01
Application Number: 02024812.6
Publication Number: 1313016
IPC: G06F 11/14, G06F 11/20
Language of the proceedings: EN

Title of invention:
Dynamic internconnection of storage devices

Applicant:
EMC CORPORATION

Opponent:
-

Headword:
Interconnecting storage devices/EMC CORPORATION

Relevant legal provisions:
EPC Art. 123(2)

Relevant legal provisions (EPC 1973):
EPC Art. 84, 111(1)

Keyword:
"Clarity - claim 1 after amendment (yes)"
"Decision - remittal for further prosecution (yes)"

Decisions cited:
-

Catchword:
-



Case Number: T 1048/06 - 3.5.01

D E C I S I O N
of the Technical Board of Appeal 3.5.01
of 20 February 2009

Appellant: EMC CORPORATION
35 Parkwood Drive
Hopkinton, MA 01748-9103 (US)

Representative: Freischem, Stephan
Patentanwälte Freischem
An Gross St. Martin 2
D-50667 Köln (DE)

Decision under appeal: Decision of the Examining Division of the
European Patent Office posted 24 November 2005
refusing European application No. 02024812.6
pursuant to Article 97(1) EPC 1973.

Composition of the Board:

Chairman: S. Steinbrener
Members: W. Chandler
P. Schmitz

Summary of Facts and Submissions

I. This appeal is against the decision of the examining division to refuse the European patent application No. 02024812.6 on the grounds that claim 1 of the main and auxiliary request was not clear (Article 84 EPC 1973). The following documents were mentioned in the examining proceedings:

D1: US-B1-6 209 002

D2: EP-A-1 039 387

D3: EP-A-1 111 509

II. In the statement setting out the grounds of appeal, the appellant requested that the decision be set aside and that a patent be granted on the basis of a main request, corresponding to the refused auxiliary request, or an auxiliary request in the form of a slightly amended claim 1. The appellant also made an auxiliary request for oral proceedings.

III. In the communication accompanying the summons to oral proceedings, the Board summarised the issues to be discussed and tended to agree with the examining division that the claims were unclear. Moreover, since D1, D2 and D3 appeared to disclose the then claimed concepts, the Board also considered that the subject-matter of the claims lacked inventive step. In a response, the appellant further amended claim 1 of the auxiliary request.

IV. At the oral proceedings before the Board, the appellant requested that the decision under appeal be set aside

and that a patent be granted on the basis of claims 1 to 26 submitted during the oral proceedings.

V. Claim 1 reads as follows:

"A method of dynamically creating a communication path between a first (24) and second (26) storage device of a remote data facility during operation of said facility, comprising:

- creating a connection between a source volume (33a-c) on the first storage device (24) accessible by a host and a destination volume (34a-c) on the second storage device (26) for transmitting data between said volumes;
- copying valid data from one of the volumes to the other volume;

characterised in that it further comprises:

- initially indicating that the source volume (33a-c) is not ready for transmission of data on the communication path;
- indicating that portions of either the destination volume (34a-c) or the source volume (33a-c) do not contain valid copies of initial data and indicating that the data from the volume containing the initial data must be copied to the other volume that does not contain the initial data;
- indicating that the source volume (33a-c) is ready for transmission of data on the communication path;
- initiating a background copy operation to copy data from the volume containing the initial data to the other one of said volumes;
- allowing said host to perform an I/O operation on a particular portion of the source volume prior to completion of said background copy operation; said I/O operation including:

- determining if the destination volume contains the initial data;
- if the destination volume contains the initial data determining if the particular portion of the source volume contains invalid data;
- if the particular portion is indicated as containing invalid data, copying data corresponding to the particular portion from the destination volume (34a-c) to the source volume (33a-c) prior to completing the I/O operation."

VI. The appellant argued essentially as follows:

The amended claim overcame the grounds for refusal.

D1, from the same applicant as the present application, disclosed providing mirrored volumes on a remote site accessible over a communications link. It did not disclose restoring invalid data on the source volume prior to completion of a background copy operation.

D2 only disclosed the standard method for synchronising the data on drives, namely performing an initial copy operation from a primary drive to a second drive.

Although D2 stated that the primary drive continued to be accessible during the initial copy, it also did not consider the situation where the host accessed invalid data on the primary drive.

Reasons for the Decision

1. The appeal complies with the requirements referred to in Rule 65(1) EPC 1973 and is therefore admissible.

Application

2. The application relates to communicating and copying data between a local and a remote storage device with a view to securing it against a crash or other disaster (paragraph [0003] of the application as published).
3. In Figure 1, when the host 22 (e.g. computer) writes data to the local storage device 24, the data is written or copied to a mirror on the remote storage device 26 via a communication path 29 (Remote Data Facility - RDF - link, paragraphs [0003] and [0028]). If either storage device is damaged the data can be reconstructed from the other device using a background copy operation. This process may take a long time over a remote link.
4. The invention overcomes this by allowing the host to access the local device during the background copy operation and if the required data is only available on the remote device, copying that part of the data to the local device using the remote link.

Clarity

5. The examining division refused the application ostensibly because of the clarity of the term "connection" to the volumes on the storage devices (point 1.1 of the decision) and the relationship between the initial and valid data on the volumes (point 1.2 of the decision). The Board agreed with this and further considered that the root of the problems lay in the clarity and support of the various names of

the storage locations (first and second "storage devices" used in both the claims and the description, first and second "sites" in the description, "R1" and "R2" volumes in the description, "source" and "destination" volumes in the claim) and the possible permutations of the positions of the data ("invalid tracks", "initial data") stored thereon.

6. In the light of the appellant's explanations and amendments to the claims, the Board understands the relevant terms in the application as follows:
- The host accesses a source volume on the first (local) storage device. A destination volume is on the second storage device at the remote facility.
- A "connection" ("RDF connection", "RDF mapping") is between a source volume and a destination volume, as specified by configuration data (paragraph [0036]).
- The "initial data" is data on the volume that is to be copied over the communication path if there is no valid data on the "connected" volume. This is indicated by setting the "invalid tracks" (Figure 2 and paragraph [0043]). The initial data can be on either volume (device) as described at paragraph [0043], for example after a device failure. For a newly created volume pair, the initial data would normally be on the local volume, but it might be on the remote volume if another host at the remote site had written data to it (paragraph [0047]).

7. The preamble of claim 1 now reads:

A method of dynamically creating a communication path between a first (24) and second (26) storage

device of a remote data facility during operation of said facility, comprising:

- creating a connection between a source volume (33a-c) on the first storage device (24) accessible by a host and a destination volume (34a-c) on the second storage device (26) for transmitting data between said volumes;
- copying valid data from one of the volumes to the other volume;

In the Board's view, these features now correctly reflect the above interpretation of a connection between two volumes. They thus overcome the examining division's objection at point 1.1 of the decision.

8. Claim 1 continues:

- characterised in that it further comprises:

- initially indicating that the source volume (33a-c) is not ready for transmission of data on the communication path;

- indicating that portions of either the destination volume (34a-c) or the source volume (33a-c) do not contain valid copies of initial data and indicating that the data from the volume containing the initial data must be copied to the other volume that does not contain the initial data;

- indicating that the source volume (33a-c) is ready for transmission of data on the communication path;

- initiating a background copy operation to copy data from the volume containing the initial data to the other one of said volumes;

The first and third of these steps are concerned with indicating that the source volume is not ready to transmit data on the communication path until the invalid data has been indicated. These features were in original claim 1 and the third step is disclosed in step 78 of Figure 2 and at paragraph [0043]. They were not in dispute in the present appeal.

Again, in the Board's view the second and fourth of these steps now correctly reflect the above-described relationship between the valid data and the initial data and their significance to the overall object of the method, namely that the portions of the volume that do not have valid data are marked to be updated from the other volume in the background copy operation. They thus overcome the examining division's objection at point 1.2 of the decision.

9. The remainder of claim 1 now contains a further aspect:

allowing said host to perform an I/O operation on a particular portion of the source volume prior to completion of said background copy operation;
said I/O operation including:

determining if the destination volume contains the initial data;

if the destination volume contains the initial data
determining if the particular portion of the source volume contains invalid data;

if the particular portion is indicated as containing invalid data, copying data corresponding to the particular portion from the destination volume (34a-c)

- to the source volume (33a-c) prior to completing the I/O operation.
10. The first step of allowing the host to perform an I/O operation on a particular portion of the source volume prior to completion of the background copy operation was already present in the refused claims. However, the appellant explained that the amended claim now contained further steps that enabled this to be done if the destination volume had the initial data (second step) and it had not yet been copied to the source volume (third step). In this case, the required data is copied (using RDF) from the destination volume to the source volume prior to completing the I/O operation (fourth step). This feature corresponds to the operation shown in Figure 3 and described at paragraph [0050]. Although the wording of the fourth step is somewhat different from that in the description, which states that the "R2 volume is used for the read or write operation using RDF", it is the same as original claim 25. In any case, the Board understands the feature in the context of the claim to mean that if the newly created volume is the (local) source volume and the host accesses a part of it that does not yet have a copy of the initial data, the data is immediately obtained from the remote device over the communication path (using RDF).
 11. Thus the Board considers claim 1 to fulfil the requirements of Articles 84 and 123(2) EPC 1973.
 12. The examining division and the Board have considered some aspects of the present invention in isolation and in the light of the prior art. In particular, the prior

art discloses the ideas of using a remote host (D1), accessing data during an initial copy (e.g. D2, paragraph [0015] and D3), and indicating that portions of volumes contain valid/invalid data, e.g. by "invalid track" bits (e.g. D2, column 6, lines 28 to 39). However, the patentability of the combination of features of amended claim 1, including the newly added aspect of the I/O operation including copying missing data from a remote device during a background copy operation has not yet been considered. Accordingly, the Board holds that the subject-matter now claimed has changed to such an extent that it needs further examination, possibly in the light of more relevant prior art. Under these circumstances, and given that, in any case, the dependent claims and the description may need to be amended, the Board considers that this work is more appropriately carried out by the first instance. The Board therefore remits the case for further prosecution (Article 111(1) EPC 1973).

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:

S. Sánchez Chiquero

S. Steinbrener