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D E C I S I O N
of 22 May 2001

Case Number: T 0637/98 - 3.5.1

Application Number: 91301225.8

Publication Number: 0443782

IPC: H04L 12/56

Language of the proceedings: EN

Title of invention:
Apparatus and method for time multiplexing a resource among a plurality of entities

Applicant:
AT&T Corp.

Opponent:
-

Headword:
-

Relevant legal provisions:
EPC Art. 54

Keyword:
"Novelty (no)"

Decisions cited:
-

Catchword:
-

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Case Number: T 0637/98 - 3.5.1

D E C I S I O N
of the Technical Board of Appeal 3.5.1
of 22 May 2001

Appellant: AT&T Corp.
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Decision under appeal: **Decision of the Examining Division of the European Patent Office posted 12 February 1998 refusing European patent application No. 91 301 225.8 pursuant to Article 97(1) EPC.**

Composition of the Board:

Chairman: S. V. Steinbrener
Members: R. S. Wibergh
S. C. Perryman

Summary of Facts and Submissions

I. This appeal is against the decision of the Examining Division to refuse European patent application No. 91 301 225.8.

II. The Examining Division held in particular that the subject-matter of claims 1 and 9 in the then valid version was obvious having regard to the document

D1: R. Pickholz (ed.), "Local Area & Multiple Access Networks", Computer Science Press Inc., Rockville (US) 1986, pages 137-154.

III. Together with the grounds of appeal dated 10 June 1998, the appellant filed two new sets of claims according to a main request and an auxiliary request.

Claim 9 of the **main request** read as follows (omitting the reference signs):

A method of making a time-multiplexed resource available to one or more entities, the method comprising the steps of:
- establishing a set of the intervals of time;
- associating pieces of work belonging to the entity with the apparatus;
- changeably associating a subset of the set of intervals of time with the entity; and
the method being characterized by the step of
- repeatedly providing the associated pieces of work to the resource for the set of intervals of time, the number of intervals of time provided for the associated pieces of work in a given one of the repeated set of intervals of time being equal to the current number of

the associated pieces of work if that number is less than the number of intervals of time in the subset associated with the entity and otherwise the number of intervals of time in the subset associated with the entity while making the resource available at a changeable guaranteed average rate.

Claim 1 was a corresponding apparatus claim.

IV. According to the **auxiliary request**, claims 9 and 1 were additionally limited by the feature that the resource is made available at a changeable guaranteed average rate "so that a maximum delay and the guaranteed average rate can be varied for different classes of entities".

V. The appellant argued *inter alia* that D1 lacked means for changeably associating a subset of the set of intervals of time with the entity. Only the present invention allowed, for example, "one class of video, entity one, to be allocated three local intervals on a first server and a second class video, entity two, to be allocated one local interval on a first server, and for these allocations to be readily changed". In D1, all video entities were treated the same.

VI. In a communication from the Board dated 23 March 2000, the rapporteur expressed the preliminary opinion that the method according to claim 9 of the main request was not new with respect to D1. It was pointed out that the expression "entity" in the claim was a general concept not limited to virtual circuits, as the appellant seemed to suggest. Furthermore, the additional feature of the auxiliary request was considered also to be known from D1.

VII. With letter dated 13 September 2000, the appellant submitted that the Board had misread or misunderstood D1. In particular, he maintained that the claimed "set of intervals" could not be equated with the sub-cycles mentioned in D1. A minor amendment was made to one of the dependent claims.

VIII. The appellant requests that the decision under appeal be set aside and that a patent be granted on the basis of the claims of either the main request or the auxiliary request.

Reasons for the Decision

The main request

1. The claimed invention relates to a "method of making a time-multiplexed resource available to one or more entities" (claim 9) and a corresponding apparatus (claim 1). Examples of such methods involve processes run on a single computer, or virtual circuits sharing a single transmission line (see column 1, lines 47 to 55 of the published application). In one known method (see Figure 1 and the associated text of the published application) a round-robin server is employed to provide use of the resource to the entities such that each entity is cyclically provided with a fixed amount of time. In this way a minimum level of service is guaranteed, but the average data rate is fixed and cannot be increased for high-priority data, such as real-time video. The invention as claimed overcomes this problem by introducing variable subsets of data. Data requiring a high average data rate are associated with large subsets. Thus, if data are transmitted in

time slots, high priority data have access to a larger number of slots per time unit.

2. *The closest prior art*

D1 is concerned with integrated local area network protocols. Such networks carry different classes of traffic, in particular isochronous traffic (voice and video, referred to as V traffic) and non-isochronous traffic (graphics and data, referred to as D traffic) (see page 141, third paragraph). To cope with all the data, the resource has to be shared between the classes of traffic. This is one of the tasks of the protocol. According to D1, proposed protocols are tested by means of a simulator (page 142, paragraph 7.4). One described protocol, referred to as a "two-cycle mechanism" (page 143 onwards; Figure 7.2c), involves the following steps for making a time-multiplexed resource available to two entities:

- establishing a set of slots (ie intervals of time);

- associating a subset ("sub-cycle") of the set of slots with the V packets (or the D packets), the length of the subset being changeable (see page 143);

- repeatedly providing the associated pieces of work (individual packets) to the resource for time corresponding to the set of slots.

Each sub-cycle having a given (but changeable) length corresponding to a certain number of slots, the sub-cycle has room for at most this number of packets. "For

the duration of the sub-cycle" the resource is "allocated for V- type packets" (or "dedicated for D-type packets") (page 143). The Board is of the opinion that this description clearly implies that the number of slots provided for the V packets (or D packets) in a given one of the repeated set of slots is equal to the current number of the associated packets if that number is less than the number of slots in the sub-cycle. Otherwise, the resource is provided with as many packets as there are slots in the sub-cycle, as indicated by the words "allocated" and "dedicated".

By changing the sub-cycle length, the resource can be made available at a desired guaranteed average rate. For example, if the average rate of V packets needs to be increased, the length of the sub-cycle corresponding to the V traffic is increased.

3. *Novelty*

3.1 Comparing the "method of making a time-multiplexed resource available to one or more entities" according to claim 9 with the prior art disclosed in D1, it can be seen that, with suitable identifications, all steps of the invention are known. Thus, the claimed "entity" is identified with the overall V (or D) traffic, the "pieces of work" are the individual V packets (or D packets), the "set of intervals of time" is the main cycle consisting of time slots, and the "subset of the set of intervals of time" is one of the sub-cycles.

There is in claim 9 a reference to "the apparatus", this apparatus apparently being an apparatus for performing the claimed method (cf. claim 1). Also this feature is implicitly disclosed in D1 since the tested

protocol is intended for a network.

3.2 The appellant has argued that the invention is different from D1 in that it allows different video classes, ie different entities, to be allocated different numbers of intervals on a server. The Board, however, while agreeing that D1 does not distinguish between different video classes, finds such a limited interpretation of the feature "entity" for the purpose of a comparison with the prior art inappropriate (see the Board's communication of 23 March 2000, point 4.5 b)). Normally, a general feature, conferring a large scope of protection, must be clearly distinguishable from the prior art if the applicant contends that the feature serves to establish novelty. That the term "entity" should indeed be understood in a wide sense is clear from the description, which mentions not just virtual circuits but also computer processes as examples of "entities".

3.3 Thus, the subject-matter according to claim 9 is not new (Article 54 EPC).

4. *The auxiliary request*

Claim 9 of the auxiliary request specifies that the resource is made available at a changeable guaranteed average rate "so that a maximum delay and the guaranteed average rate can be varied for different classes of entities". This feature is also known from D1 since each sub-cycle as well as the total cycle can be varied in length. It should be clear that these adjustable parameters will determine the average rate as well as the maximum delay for both kinds of traffic. Again, the wording "classes of entities" is so general

that the claim does not exclude what is already known.

Thus the method claimed in accordance with the auxiliary request is not new either.

Order

For these reasons it is decided that:

The appeal is dismissed.

The Registrar: The Chairman:

M. Kiehl S. Steinbrener