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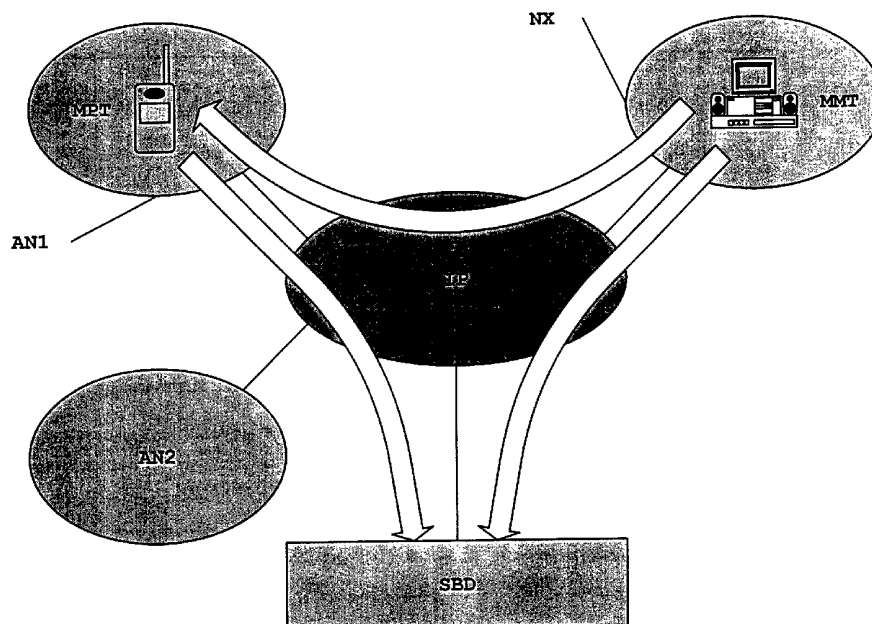
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(54) Title: SERVICE BROKER



(57) Abstract: The present invention provides a method of providing service specific information for the performance of communication between at least two networks (AN1, AN2, NX). This method comprises the steps of attaching a terminal (MPT) by a user to an access network (AN1); submitting information about a current operation environment of said terminal (MPT) to a service broker device (SBD); defining data exchange possibilities of said terminal (MPT) for services by said service broker device (SBD); storing said data exchange possibilities for services as data being related to said user; and providing said data exchange possibilities for services upon a corresponding appropriate request.



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Service Broker

Field of the Invention

5 The present invention relates to a method of providing service specific information for the performance of communication between at least two networks and to a method of defining a service connection between the terminals of users, said service connection being between
10 at least two networks.

Related background Art

Many of the efforts made in recent years in the field of
15 tele- and data communication aim to enable communication between any device which is able to communicate. That is, some kind of compatibility shall be present between communication terminals such as personal computers, mobile phones, image transmitting phones and the like, at
20 least in principle. However, a compatibility between devices can only be present for like or at least similar kinds of data, i.e. for speech data, video data, email and so on, for example. To be precise, a definition for compatibility might only be possible for each kind of
25 data separately.

As a result, the communication possibilities between communication terminals are dependent from the kind of data to be exchanged. Namely, there arises the problem
30 which terminal is able to receive (i.e. to process) which kind of data. In fact, at present communication networks are defined and divided from each other in view of this aspect. However, the communication technology progresses forward to a more indistinct status, enabling to transmit
35 whatever data across the networks.

For such a free exchange of data, the different networks
itself are to be networked. This networking requires a
unique standard for the data exchange which, needless to
5 say, is the internet protocol (IP). This means that the
exchange of data of whatever kind can be easily realized
over the Internet. However, this is only an example, but
an already realized one.

10 Furthermore, while having different networks but a unique
data exchange standard then, when thinking of mobile
communication terminals such as portable computers,
mobile phones, and the like, these devices shall be able
to access to at least most of the networks, regardless of
15 their abilities to process certain kinds of data.

Anyway, the sake of communication is rather a question of
who communicates with whom and the answer to how the
communication is done should serve this sake. Namely,
20 there is at least one user or subscriber behind each
originated communication as well as behind each
terminated communication. Accordingly, an originated
communication has at least one certain destination which
might rather be a user or subscriber than a device,
25 although this might also be possible.

11
To reach a user/subscriber in the internet, she or he may
have at least one logical address, and the logical
address may correspond to at least one of possible
30 physical addresses. Thus, in order to find out which
physical address is related to which logical address for
a communication originating user/subscriber, there is a
device called Domain Name Server (DNS).

Summary of the Invention

It is an object of the present invention to provide possibilities for enabling communication between
5 communication terminals between at least two networks.

According to the present invention, one example for a solution thereof is a method of providing service specific information for the performance of communication
10 between at least two networks. This method comprises the steps of attaching a terminal by a user to an access network; submitting information about a current operation environment of said terminal to a service broker device; defining data exchange possibilities of said terminal for
15 services by said service broker device; storing said data exchange possibilities for services as data being related to said user; and providing said data exchange possibilities for services upon a corresponding appropriate request.

20

Stated in other words, with a device being adapted to perform the steps of receiving information about a current operation environment of a terminal being attached by a user to an access network; defining data
25 exchange possibilities of said terminal for services; storing said data exchange possibilities for services as data being related to said user; and providing said data exchange possibilities for services upon a corresponding appropriate request; as another example for a solution to
30 the above given object, the above described method can effectively be performed.

Accordingly, such a service broker device is able to provide for example information about the user,
35 properties of the network the user is located in, and the

device the user is using. This information is available for networks and other users.

According to the present invention, another example for a solution of the above given object is a method of defining a service connection between the terminals of users, wherein said service connection is to be present between at least two networks. This method comprises the steps of requesting to a service broker device by calling user of said at least two networks, before a call is established, which services for data exchange with a call terminated terminal of a user to be called are possible; and providing respective information by said service broker device by a method according to a method as described above, for example.

Consequently, correct communication methods can be used and people can be addressed across several networks. Thus, a method is provided to find out how to reach the counterpart(s) correctly at any given time, when only the logical identification of the counterpart is given. In addition, the communication devices do not have to be similar anymore in order to be able to communicate with each other, and it is not necessary to know the exact address of the counterpart and the network the counterpart is located. Also, for users having only one logical address, this is an important improvement.

Brief Description of the Drawings

30

Preferred embodiments of the present invention are described herein below in detail by way of example with reference to the accompanying drawings, in which



Fig. 1 shows an example of a functionality of a service broker device on network level in accordance with the present invention;

5 Fig. 2 illustrates examples for the operation of the related devices in accordance with the present invention; and

Fig. 3 illustrates a layered approach by the example of
10 the internet protocol (IP) stack in accordance with the present invention.

Description of the preferred Embodiments

15 From the following description of the preferred embodiments, the above mentioned and further solutions of the object underlying the present invention will become apparent in connection with their features and advantages.

20

Referring to Fig. 1, there is shown an example of a functionality of a service broker device on network level in accordance with the present invention. Specifically, there are access networks AN1, AN2 which are connected to
25 another network and via this other network, for example and preferably the Internet IP. A portable, i.e. mobile, communication terminal MPT may be attached to these access networks, while another communication terminal of any kind is present in a network NX. The network NX may
30 be also of any kind, but connected to the "connecting network", herein, to the Internet. The communication terminal MMT may be of any kind, as mentioned, and accordingly be able to use any amount of specific data.

However, as an embodiment presently considered to be of relevance, the specific data shall be related to specific services, since presently data exchange is mostly performed with corresponding specific services. For the sake of explanation, the communication terminal MMT may be a multimedia terminal, thus to assume this communication terminal MMT is able to deal with any kind of communication service.

10 According to the present invention, the user of the terminal MPT would attach the terminal MPT to the access network AN1, for example. Then, an update procedure is started with which the user submits to a service broker device SBD that she/he is currently in the access network
15 AN1, using a certain terminal MPT, and (maybe accordingly) is able to use a certain amount of services. The data submitted by this update procedure shall not be limited to that but rather have the extent necessary to define a communication in question. If a part of this
20 data changes, for example the access network is changed to network AN2 or the used terminal is changed, a further update procedure is executed.

Hence, at any time, the service broker device SBD is
25 aware of data which is necessary to define a (service) communication with the user of the terminal MPT. Defining a (service) communication means here that the service broker device is able to provide information which services can currently be used by the user of terminal
30 MPT, i.e. which kind of data can be processed/displayed by the current terminal of that user.

To be precise, due to certain limited capabilities either of the terminal MPT or of the network AN1, some of the
35 services offered (by an arbitrary functionality) may not

work. Hence, the offering of these services or their use could be limited. This, however, is apparent to the service broker device.

- 5 Now, two examples are given which emphasize the solved problem.

Example 1: Network based service limitation

- 10 First a terminal of a user is connected to a fixed LAN (data rate: 100 Mbit/s), and all services are offered. Then, the user takes the terminal out of this fixed connection and walks around the office building (while being connected via Wireless LAN; data rate: 10 Mbit/s).
- 15 The offered services are limited to a certain extent (not more than one simultaneous multimedia connection or a multimedia connection with a lower frame rate or a lower image quality). After that the user moves outside the building and changes to a 3G network (data rate: 1
- 20 Mbit/s). Therein, services are limited even more. Then the user moves to a rural region, where only a 2G network is in place. Thus, no multimedia connection is available. The point is that the terminal is the same, but the limitation results from the network.

25

Example 2: Terminal based service limitation

- A user has two terminals, one multimedia terminal and one 2G terminal. Thus, a caller can check which one is "on",
- 30 and if only the 2G terminal is on, then the caller knows that he has to make an ordinary speech connection and does not "bother" the user with a multimedia call. In contrast thereto, if the multimedia terminal is "on", then the caller can choose which type of connection he
- 35 wishes to establish.

With reference to fig. 1 means this that when the user of the terminal MMT wants to establish a call to the user of the terminal MPT, she/he would first make an inquiry to
5 the service broker device SBD to achieve information where the user of the terminal MPT is (this might also be relevant to know which costs are caused by a call) and what kind of services she/he can currently use (e.g. mail, telephony, multimedia messaging and so on).

10

From the services being available to both terminals MPT and MMT, the user of the terminal MMT can now select one or more service. The corresponding call is of high precision and data is exchanged with high security.

15

In Fig. 2, corresponding steps of methods are set in relation to the service broker device SBD. That is, in a step S20, the user of the terminal MPT attaches the terminal MPT to the access network AN1. Next, the current
20 operation environment COE of the terminal MPT is submitted to the service broker device SBD in a step S21. The expression current operation environment is to be understood as comprising all information relevant to define a call with the user of the terminal MPT. That is,
25 according to the aforesaid there is particularly information included about service limitations arising from either a network currently accessed to or currently used terminal. Then, an according service definition for the terminal MPT is generated by the service broker
30 device in a step S22. Subsequently, step S23 corresponds to storing of these service definitions, i.e. the data exchange possibilities for services. These service definitions are stored as data being related to the user of the terminal MPT. The last step of this method
35 depicted in Fig. 2 provides that a request is made to the

service broker device in a step S24, upon which the service broker device is able to provide the data exchange possibilities of the terminal MPT to the requesting party.

5

However, from the viewpoint of communication technology, the steps S24 of requesting to the service broker device SBD from a call originating terminal which data exchange services are possible and S25 of providing the respective
10 information by the service broker device SBD constitute a separate method which is related to the establishing of a call between, for example, the terminals MPT and MMT.

What is of high significance for the establishing of such
15 a call is that this method of defining a service connection between the terminals MPT and MMT of the respective users comprising these two steps S24 and S25 can and preferably shall be executed before this call is established, thereby providing the advantage that a
20 suitable communication extent in view of the possible data exchange is selected.

Even more, the present invention also includes the possibility that the user of the terminal MMT executes
25 the steps S24 and S25 from a terminal which is different from the terminal MMT.

From Fig. 2 and the above given description, also the principle of the construction of the service broker
30 device SBD is apparent.

Accordingly, the service broker device SBD may comprise means being adapted to receive information about a current operation environment of a terminal attaching to
35 an access network; means being adapted to define data

exchange possibilities of said terminal for services;
means being adapted to store said data exchange
possibilities for services as data being related to a
user of said terminal; and means for providing said data
5 exchange possibilities for services upon a corresponding
appropriate request.

What follows next is what is presently considered to be
the best mode of carrying out the present invention.

10

Referring now to Fig. 3, there is shown the internet
protocol stack, which most likely becomes the dominant
communication protocol. Thus, it is conceivable that the
internet protocol (IP) runs over any transport media such
15 as asynchronous transfer mode (ATM), time division
multiplex (TDM), fiber and the like, and, in turn, that
every media stream such as speech, video, or other kinds
of data runs over the internet protocol.

20 Specifically, an application (see Fig. 3 top) is needed
to allow the user to update hers/his user related
information into the service broker device SBD when
she/he attaches a terminal to some access network AN1,
AN2. This application can be built on top of the
25 transport control protocol (TCP) layer of the internet
protocol stack. For example, this application might just
access the predefined data structure of the service
broker device SBD.

30 In addition, a kind of mechanism is necessary to provide
the above mentioned inquiries to the service broker
device. Here, an example may be to just inquire the
device preferences, i.e. the above mentioned current
operation environment COE, that the user is currently
35 using, which can be based in TCP/IP protocol suite while

the data representation of the service broker device SBD can be based e.g. in the format of extended markup language (XML format).

- 5 Further, the functionality according to the service broker device SBD can be attached to the domain name server (DNS) which provides logical address resolution for the user identity in the Internet (e.g. juhapekka.niemi@nokia.com or juhapekka.niemi.nokia.com).
- 10 The data model of an address according to the domain name server, i.e. the mapping from logical to physical which is already implemented into the domain name server, needs to be complemented with the device capabilities data and other relevant information needed such as time-of-day,
- 15 routing data and so on according to the above.

- As is described above, the present invention provides a method of providing service specific information for the performance of communication between at least two
- 20 networks AN1, AN2, NX, said method comprising the steps of attaching S20 a terminal MPT by a user to an access network AN1; submitting S21 information about a current operation environment COE of said terminal MPT to a service broker device SBD; defining S22 data exchange
- 25 possibilities of said terminal MPT for services by said service broker device SBD; storing S23 said data exchange possibilities for services as data being related to said user; and providing S25 said data exchange possibilities for services upon a corresponding appropriate request
- 30 S24.

It should be understood that the above description and accompanying drawings are only intended to illustrate the present invention by way of example only. The preferred

embodiments of the present invention may thus vary within the scope of the attached claims.

Claims

1. A method of providing service specific information for the performance of communication between at least two
5 networks (AN1, AN2, NX), said method comprising the steps of

attaching (S20) a terminal (MPT) by a user to an access network (AN1);

submitting (S21) information about a current
10 operation environment (COE) of said terminal (MPT) to a service broker device (SBD);

defining (S22) data exchange possibilities of said terminal (MPT) for services by said service broker device (SBD);

15 storing (S23) said data exchange possibilities for services as data being related to said user; and

providing (S25) said data exchange possibilities for services upon a corresponding appropriate request (S24).

20 2. A method of defining a service connection between the terminals (MPT, MMT) of users, said service connection being between at least two networks (AN1, AN2, NX), said method comprising the steps of

requesting (S24) to a service broker device (SBD) by
25 a calling user of said at least two networks, before a call is established, which services for data exchange with a call terminated terminal (MPT) of a user to be called are possible; and

providing (S25) respective information by said
30 service broker device (SBD) by a method according to claim 1.

3. A method according to claim 2, wherein said calling user makes said requesting (S24) with a terminal which is

different from that (**MMT**) with which data exchange possibilities are to be defined (**S22**).

4. A method according to any one of the preceding claims,
5 wherein said current operation environment (**COE**) is limited by said terminal (**MPT**) which current operation environment (**COE**) is to be submitted.

5. A method according to any one of the preceding claims,
10 wherein said current operation environment (**COE**) is limited by said access network (**AN1**) to which said terminal (**MPT**) is attached which current operation environment (**COE**) is to be submitted.

15 6. A method according to any one of the preceding claims, wherein the Internet Protocol (**IP**) is used for interaction with said service broker device (**SBD**).

7. A device comprising
20 means being adapted to receive information about a current operation environment (**COE**) of a terminal (**MPT**) attaching to an access network (**AN1, AN2**);
means being adapted to define data exchange possibilities of said terminal (**MPT**) for services;
25 means being adapted to store said data exchange possibilities for services as data being related to a user of said terminal (**MPT**); and
means for providing said data exchange possibilities for services upon a corresponding appropriate request.

30

8. A device according to claim 7, wherein said device (**SBD**) further comprises the functionality of the domain name server of the Internet.

9. A device according to claim 7 or 8, wherein said device (**SBD**) is adapted to use the Internet Protocol (**IP**) for interactions.

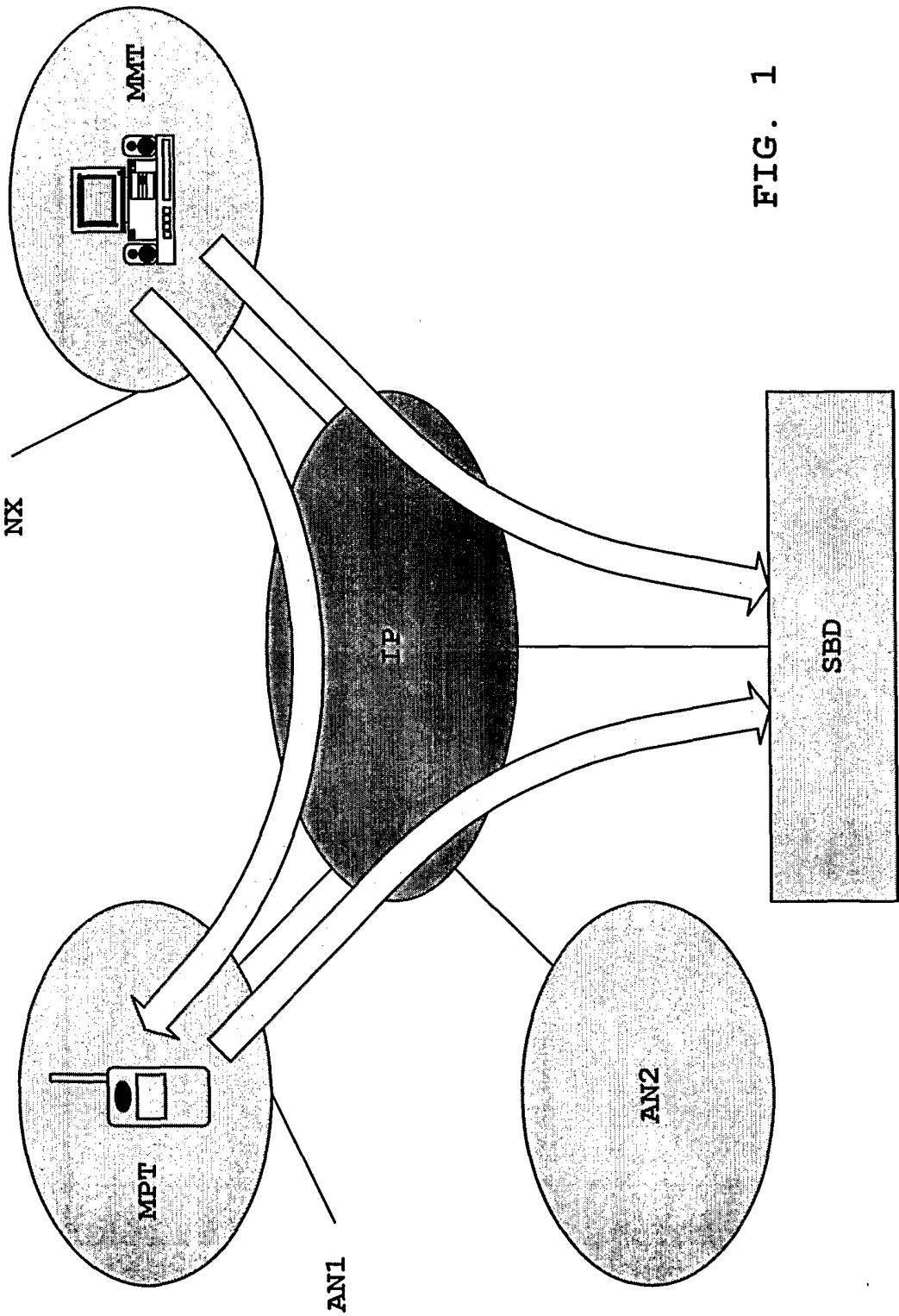
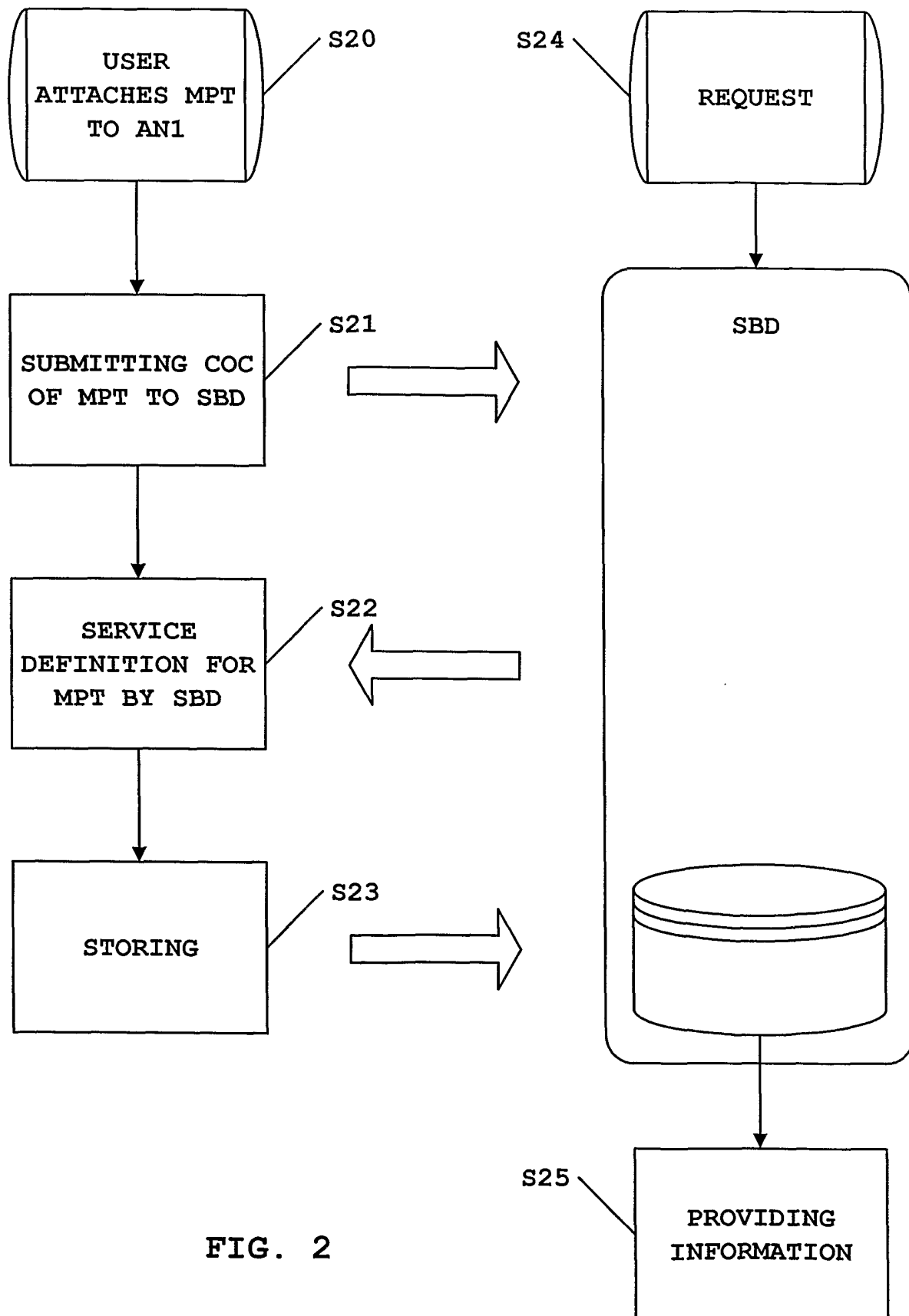


FIG. 1

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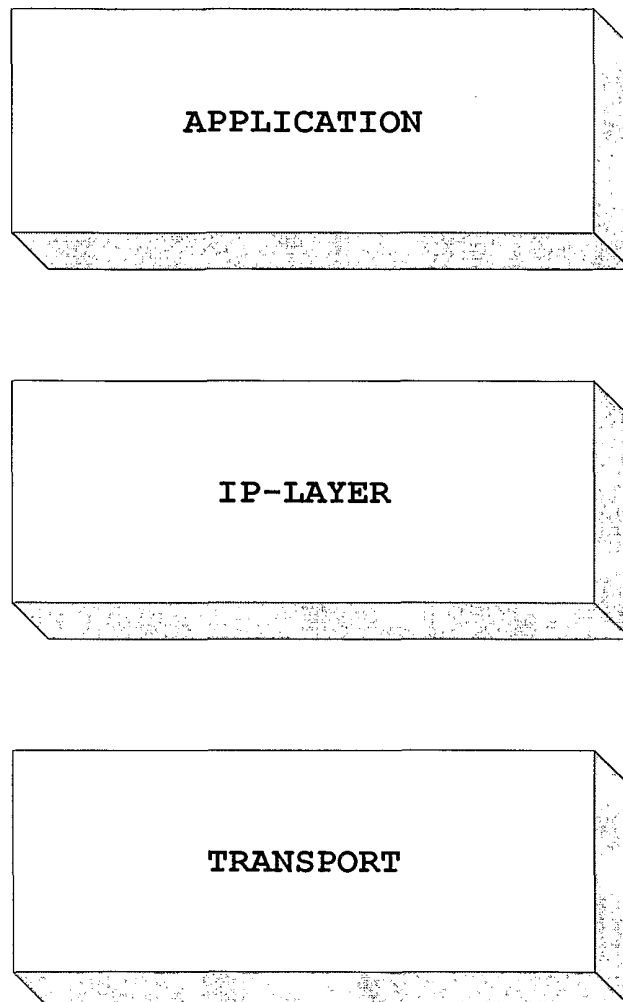


FIG. 3



INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04L29/06 H04L29/12 H04L12/28

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)

IPC 7 H04L H04Q

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, PAJ, INSPEC, COMPENDEX, IBM-TDB

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

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INTERNATIONAL SEARCH REPORT

In International Application No

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