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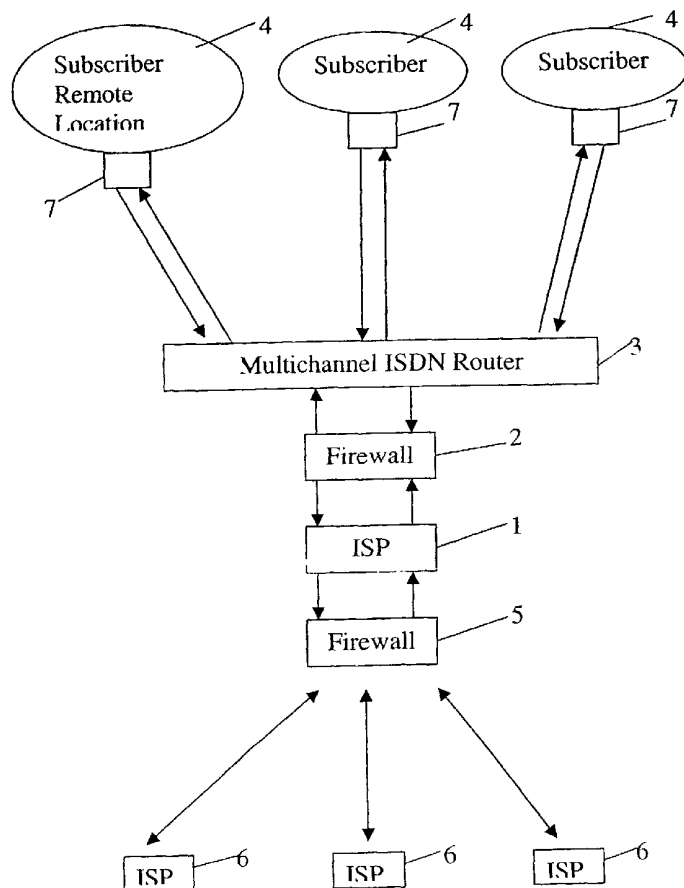
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(54) Title: AN ELECTRONIC MAIL SYSTEM



(57) Abstract: An electronic mail system for processing electronic mail between users across a computer network using a target mail server which receives, stores and downloads mail messages to a target subscriber system. The server operates to automatically initiate a communication link in real time with the target subscriber to deliver each message as soon as it is received rather than storing the messages and awaiting a download request from the target subscriber. In another electronic mail system, the target mail server interrogates the target subscriber system to determine if a mail receiving function is active. In case of inactivity, the mail receiving function is initialised.



WO 02/07397 A1



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AN ELECTRONIC MAIL SYSTEM

The present invention relates to an electronic mail (email) system and more particularly to a method of operating such a system to convey mail between users across the Internet.

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Every email account has an associated mail server in which mail posted to that account is received and stored. This mail server may be a dedicated device or be a virtual device hosted by an Internet Service Provider (ISP). Irrespective of the type of mail server being used it is necessary for the intended mail recipient to establish contact with the mail server to retrieve mail.

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The most common method, by which mail is retrieved, requires a user to periodically establish a communication link with the mail server and request delivery of any stored mail. While this ensures cost effective delivery of mail messages the ad hoc user intervention prevents real time mail delivery. Indeed, in certain circumstances, it is possible for a message to remain stored for several days before retrieval which is obviously unacceptable.

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To overcome this, systems have been developed to automatically initiate contact with the mail server at predefined intervals and retrieve any stored mail before terminating the connection. While this prevents long term non detection of mail, the communication interval means that the system does not operate in real time. It is possible to reduce this interval to achieve near real time operation but only with a corresponding increase in operating costs.

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Larger organisations would generally have dedicated mail servers which are connected to the internet by dedicated 'leased lines'. The mailservers and other computers on the organisations' internal networks are protected from unauthorised users on the internet by 'firewalls'. The cost of leased lines and firewalls are often prohibitive for small and medium sized companies.

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In the absence of a dedicated leased line, these smaller organisations and individuals periodically establish a communications link to the mail server and request the delivery of any stored mail. While this ensures cost effective delivery of mail messages the ad hoc user

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intervention prevents real time mail delivery. Indeed, in certain circumstances, it is possible for a message to remain stored for several days before retrieval which is obviously unacceptable.

- 5 When a user or organisation, without a firewall, connects to the mail server, particularly when hosted by an ISP, for the duration of that communication, their computer network is on the public network with no security protection. This can afford an unscrupulous user with access to the system and to the data contained thereon. Timed interval connections, which are not protected are particularly susceptible to unauthorised intrusion as the hacker can prevent
10 termination of the connection and obtain continued access.

The present invention is directed towards overcoming the aforementioned problems.

- According to the invention there is provided a system to convey email between users across the
15 Internet comprising a target mail server which receives an email, stores the email and downloads the email to a target subscriber, characterised in that on receiving an email the mail server carries out the following steps:-

- opening a communication link with the target subscriber;
20
downloading the email to the target subscriber; and
terminating the communication.

- 25 Advantageously, the entire system is thus protected from hackers by a firewall system which allows in from the internet only SMTP traffic (mail) destined for users of the system (target subscribers)

The advantage of this is that the target subscriber in effect gets all the benefits of an open leased line and firewall without the associated cost premium.

Preferably, the mail server opens communication with the target subscriber, the system performs the preparatory steps of: -

- 5 extracting a target subscriber identifier from the received email;
- retrieving and interrogating a contact database using the extracted target subscriber identifier to obtain a contact parameter file; and
- 10 using the contact parameter file to establish communication.

Ideally, the contact database incorporates encryption means.

In a particularly preferred arrangement, the system incorporates graphic processing means.

- 15 Ideally, the mail server is configured to process messages in excess of one hundred and sixty characters.

Ideally, the mail server is also configured to process complex or encoded messages.

- 20 According to one aspect of the invention the mail server incorporates an application Program Interface and associated applet for automatically performing the steps of: -

- interrogating a user system to determine if a mail receiving function is active; and
- 25 in response to a mail receiving function inactive signal, means for initialising a mail receiving function prior to downloading the received email.

Preferably, the mail receiving function incorporates alert means for temporarily suspending processing at the user system and alerting a user to the received email.

It is envisaged that if on contacting the target subscriber, the mail server cannot open communication, the mail server stores the email in a priority contact database and after a pre-set time interval has elapsed, again contacts the target subscriber and continues to do so until the email is downloaded. It is highly unlikely that contact would not be obtained, but in this unlikely event then contact will be made as quickly as possible.

Indeed, it is envisaged that on downloading the email to the target subscriber, the mail server carries out the following steps:-

- 10 the mail server opens communication with a sending subscriber mail server;
- the mail server transmits a confirmation message reporting delivery of email to the sending subscriber mail server; and
- 15 the mail server terminates the communication.

In this latter method, if on contacting the sending subscriber mail server, the mail server cannot open communication, the mail server stores the confirmation message in a priority confirmation database, and after a pre-set time interval again contacts the sending subscriber and continues to do so until the confirmation message is sent.

When the target subscriber, which is contacted directly by the mail server is a subset of all the subscribers connected to the mail server, the mail server reserves portion of the bandwidth allocated from the communications network for those target subscribers to provide priority of access to the mail server.

When the target subscriber which is contacted directly by the mail server is a subset of all the subscribers connected to the mail server, the mail server stores the originating address of such target subscribers as priority addresses and then on receipt of a message having a destination or originating address which is a priority address, the email is queued for onward processing ahead

of all emails other than those already received emails with priority addresses.

Further the invention provides an internet service system comprising a mail server including:-

5 a server;

a communications system;

a plurality of subscribers connectable to the server by a communications system;

10

a processor forming part of the server and programmed to recognise the address of at least some of the subscribers as priority target subscribers; and

15

on receiving a message for the target subscriber, the processor contacts the target subscriber and opens communication with the target subscriber before downloading the email.

Ideally, the communications system includes a multichannel Integrated Services Digital Network (ISDN) router and individual ISDN routers for each subscriber.

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In one embodiment of the invention the server is connected to a priority contact database for emails and the processor is programmed to store those emails which are not downloaded as the processor was unable to open communication with the target subscriber.

25 Ideally the system includes firewall means.

The invention will be more clearly understood from the following description of some embodiments thereof, given by way of example only, with reference to the accompanying drawings in which:-

30

Fig. 1 is an outline of the system according to the invention; and

Figs. 2 and 3 are flowcharts showing operation of one method according to the invention.

5 Referring to the drawings and initially to Fig. 1, there is illustrated an internet service provider (ISP) 1 forming part of an email system and including a server (not shown) and various databases which will be described later. The ISP 1 is also referred to as the target ISP in this specification to distinguish it from the other ISPs. The ISP 1 includes a firewall 2 between it and a multichannel ISDN router 3 which in turn is connected by the communications network to
10 various subscribers 4. The ISP 1 comprises a server and programmable processor, not shown. The ISP 1 also includes a priority contact database again not illustrated, which is connected to the server. The ISP 1 is connected to the Internet which also serves other ISPs 6. Each subscriber 4 is provided with an ISDN router 7 which can make and receive calls on demand of traffic. In use, when the ISP 1 receives an email, it is delivered immediately to the multichannel ISDN router 3
15 where it is immediately dispatched to the appropriate ISDN router 7. The ISDN router 7 will accept a call presuming a connection can be made and then the email is downloaded immediately to the subscriber 4. Thus, the subscriber 4 has all the advantages of a dedicated ISDN leased line. Effectively, the transmission of email does not wait the next call being made and this means that a significant delay which can occur, even if a company is dialling its target ISP on a 10 to 15
20 minute basis, is eliminated. A further problem as will be appreciated with the normal situation, is that calls are made regardless of whether an email is ready to be sent or received.

In one particular embodiment of the invention and as described in Fig. 1, the target ISP 1 receives, through the firewall 5 from another ISP 6, an email for one of its subscribers 4. The
25 ISP immediately delivers, through the firewall 2 and the multichannel ISDN router 3 which is capable of making and accepting connections on demand of traffic, the email to the appropriate ISDN router 7 and hence the subscribers 4.

Similarly with outgoing email the target subscribers 4 email is delivered immediately to the
30 multichannel ISDN router where it is received and immediately transferred to another

subscriber 4, or to an ISP 6. The only delay which the sender will experience in the transmission of emails will be the recipients frequency of access. This can be effectively instant transmission where the receiving party has a leased line or is subscribing to the present invention.

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Referring now to Figs. 2 and 3, one method according to the invention is described. In this method, there is a need as will be appreciated for various databases, etc. However, rather than describe all these separately, it is better to describe them in conjunction with the flowchart. It is presumed that in this particular email system, all the subscribers that the ISP is serving do not subscribe to this additional service. The effect of this will become apparent later. Therefore, those targeted subscribers of the ISP who are connected to this additional service are described as priority target subscribers and those subscribers who do not or are not connected to the service, although they are served by the particular ISP or target ISP are simply subscribers or targeted subscribers.

15

In step 10, another ISP sends an email. In step 11, the target ISP receives the email and in step 12, the target ISP checks a priority database, which priority database has a list of those priority targeted subscribers, i.e. those to whom the method is to be applied and will also have a list of those targeted subscribers who are not subscribers to the system. In the event of the check in step 12 showing that the targeted subscriber is not a priority targeted subscriber, then in step 20 13, the email is stored in conventional fashion and in step 14, it will be downloaded to the targeted subscriber when the targeted subscriber contacts the ISP in conventional fashion and then the session ends in step 15 for that targeted subscriber. If, however, on the other hand, the targeted subscriber is one of the subscribers utilising the service and thus listed in the priority database, in step 25 16 the ISP checks the email to find out whether it is one being sent by the targeted priority subscriber or one being sent to the priority targeted subscriber. If the priority target subscriber is sending the email itself, then in step 17, the ISP attempts to send the email as quickly as possible and if unable to send it, in step 18, retries and continues to retry until the email is sent. When the email has been sent, in step 19, the ISP confirms to the 30 priority target subscriber that the email has been sent. If the ISP is unable to contact the

priority target subscriber in step 19, then the confirmation is stored in a confirmation database in step 20 and in step 21, at regular intervals, the ISP continues to try to contact the priority target subscriber to confirm that the email has been sent. When this is done, the session ends in step 22.

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If, however, in step 16, it was apparent that the priority target subscriber is the intended recipient of the email, then in step 23, a firewall is consulted and checked. In step 24 it is accepted or rejected. Presuming the email is not accepted, then in step 25, the email is refused. If the message is accepted immediately, then the system attempts to contact the target in step 26. In step 27, the target ISP opens communications with the priority target subscriber and in step 28, presuming that it is unable to open communications, the message is stored in a priority buffer and periodically, over very short periods of time, in step 29, the ISP retries to open communications with the priority target subscriber. In step 30, the email is downloaded and in step 31, the session ends.

15

The use of the system for sending emails may not be used in all instances. It will be appreciated that in many instances, all the target subscribers connected to an ISP will in fact avail of the service. It is also envisaged that not all of the target subscribers will avail, for example, of the firewall facility. When, for example, the target downloading the email to a target subscriber and both the sending subscriber and the target subscriber are connected to the ISP, then the ISP can additionally add, as explained above, further help in the sense that they can confirm to the sending subscriber that the email has been delivered.

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The advantage to the subscribers in the system including a firewall is considerable. The risk of unauthorised access is greatly reduced without the attendant firewall maintenance costs.

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It is also envisaged that virus checking will be carried out.

It is envisaged that when the target subscriber, which is contacted directly by the ISP, is a subset of all the subscribers connected to the ISP, the ISP will reserve some portion of the

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bandwidth allocated from the communications network to those target subscribers to provide priority of access to the target ISP. In many instances, the servers of ISPs get overloaded at certain periods of time and thus the priority targeted subscribers will be given priority of delivery of emails as well as reception.

5

It will be appreciated that the invention can be relatively easily carried out by having a processor forming part of the server which is programmed to recognise the address of at least some of the subscribers as priority target subscribers and on receiving a message for the priority target subscriber to contact the priority target subscriber and open communications with it.

10

Another great advantage of the present invention is that for the small to medium sized company, all the benefits of a leased line have been achieved without the cost. Also, the advantage, for example, of having a shared firewall, will ensure greater security and less likelihood of breaches. A major management responsibility is removed.

15

In the specification the terms "comprise, comprises, comprised and comprising" or any variation thereof and the terms "include, includes, included and including" or any variation thereof are considered to be totally interchangeable and they should all be afforded the widest possible interpretation.

20

Another embodiment of the invention is now described. To prevent confusion, the mechanism by which mail is sent across the Internet is not described, as this does not form part of the current invention. When a mail server receives an email, the mail is processed by the mail server to extract a target subscriber identifier. This identifier will typically be the email address to which the mail is sent. A check is then performed by retrieving and interrogating a contact database using the extracted identifier. This check is particularly useful where the system is being retrofitted to an existing mail server to add functionality. That is to say that existing users may continue to obtain mail in the conventional way or may be offered the real time, cost effective, secure mail system of the current invention as an option. If the user to whom the mail was

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addressed is a subscriber, a contact parameter file for that user is retrieved and decoded. Decoding or decryption is a necessary security precaution to prevent hackers obtaining the contact details.

- 5 Communication between the mail server and the user is then established and the received mail downloaded before communication is terminated.

The invention the mail server incorporates an Application Program Interface (API) and associated applet for interaction with a user system. The API interacts with the user system when
10 the communication link is established to automatically interrogate the user system to determine is a mail receiving function is active. This may be achieved by memory mapping or simply by interrogation of the task manager. If the interrogation determines that a mail receiving function is not active a mail receiving function inactive signal is generated. This signal is passed to the applet and acts as a trigger to initialise the mail receiving function prior to down loading the
15 received email. The applet may be downloaded during communication or may be provided to the user during installation. It will be understood by those skilled in the art that this functionality may be achieved in a variety of ways without departing from the scope of the invention. For example, a macro may be used instead of an applet.

- 20 Preferably, the mail receiving function incorporates alert means for temporarily suspending processing at the user system and alerting a user to the received email.

It will be understood that the system is configured to allow processing of graphic files and text files in excess of one hundred and sixty characters as well as encoded messages such as Hyper
25 Text Markup Language (HTML), Extensible Markup Language (XML) or Standard Generalised Markup Language (SGML) etc. Complex messages, which may be simply text with HTML, tag inserts or text messages with associated text or graphic files may also be processed.

- It will also be understood that while reference is made extensively throughout the specification to mail servers and to ISP's that the functions of both may be merged. For example, currently available internet service providers incorporate mail servers, it is important for this invention to realise that each mail item, conveyed across the Internet is delivered in real time without the
- 5 requirement for a leased line to the desired addressee. The addressee being one of a very large number of possible addresses and that these addressees can operate from many locations and on a disparate array of mail platforms. It will also be understood that the addressee may be an individual within a company and the mail will be routed accordingly.
- 10 The invention is not limited to the embodiments hereinbefore described but may be varied in both construction and detail within the scope of the appended claims.

Claims

1. An electronic mail system to convey mail between users across a computer network comprising a target mail server for receiving an electronic mail message, storing the message and downloading the email to a target subscriber system, characterised in that on receiving the mail message the target mail server performs the sequential steps of :-
- 5
- automatically initiating a communication link in real time with the target subscriber;
- 10
- transmitting the received electronic mail message to the target subscriber; and
- terminating the communication.
- 15 2. An electronic mail system as claimed in claim 1 in which the mail server initiates communication with the target subscriber by performing the preparatory steps of: -
- extracting a target subscriber identifier from the received mail message;
- 20
- retrieving and interrogating a contact database using the extracted target subscriber identifier to obtain a contact parameter file; and
- using the contact parameter file to establish communication.
- 25 3. An electronic mail system as claimed in claim 2 in which the contact database incorporates encryption means.
4. An electronic mail system as claimed in any preceding claim wherein the system incorporates graphic processing means.

5. An electronic mail system as claimed in any preceding claim in which the mail server is configured to process messages in excess of one hundred and sixty characters.
6. An electronic mail system as claimed in claim 6 or claim 7 the mail server is so configured that on downloading the email to the target subscriber, the mail server performs the steps of :-
- initiating communication with a sending subscriber mail server;
- 10 transmitting a confirmation message reporting delivery of email to the sending subscriber mail server; and
- terminating the communication.
- 15 7. An electronic mail system of the type having a target mail server for receiving an electronic mail message, storing the message and downloading the email to a target subscriber system characterized in that the mail server incorporates an application Program Interface and associated applet for automatically performing the steps of: -
- 20 interrogating the target subscriber system determine is a mail receiving function is active; and
- in response to a mail receiving function inactive signal, activating means for initialising a mail receiving function prior to down loading the received email.
- 25 8. An electronic mail system as claimed in claim 7 in which the mail receiving function incorporates alert means for temporarily suspending processing at the user system and alerting a user to the received email.

9. An electronic mail system as claimed in claim 7 or claim 8 the mail server is so configured that on downloading the email to the target subscriber, the mail server performs the steps of :-
- 5 *initiating communication with a sending subscriber mail server;*
- transmitting a confirmation message reporting delivery of email to the sending subscriber mail server; and*
- 10 *terminating the communication.*
10. An internet service system comprising a mail server including:-
- a server;*
- 15 *a communications system;*
- a plurality of subscribers connectable to the server by a communications system;*
- 20 *a processor forming part of the server and programmed to recognise the address of at least some of the subscribers as priority target subscribers; and*
- on receiving a message for the target subscriber, the processor contacts the target subscriber and opens communication with the target subscriber before*
- 25 *downloading the email.*
11. An internet service system as claimed in claim 10 in which the communications system includes a multichannel Integrated Services Digital Network (ISDN) router and individual ISDN routers for each subscriber.

12. An internet service system as claimed in claim 10 or 11 in which the server is connected to a priority contact database for emails and the processor is programmed to store those emails which are not downloaded as the processor was unable to open communication with the target subscriber.

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13. An internet service system as claimed in any of claims 10 to 12 in which the system includes firewall means.

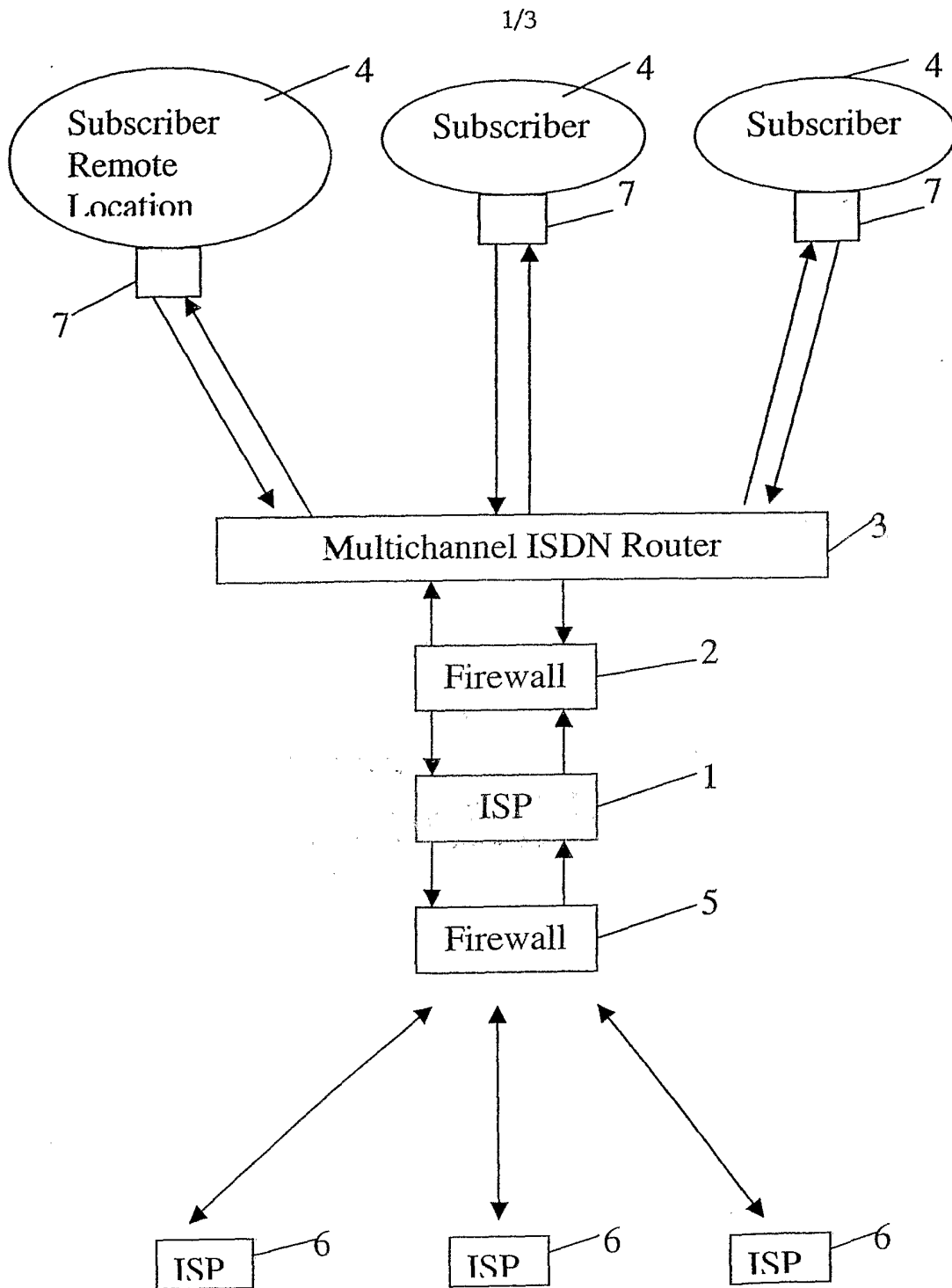


Fig. 1

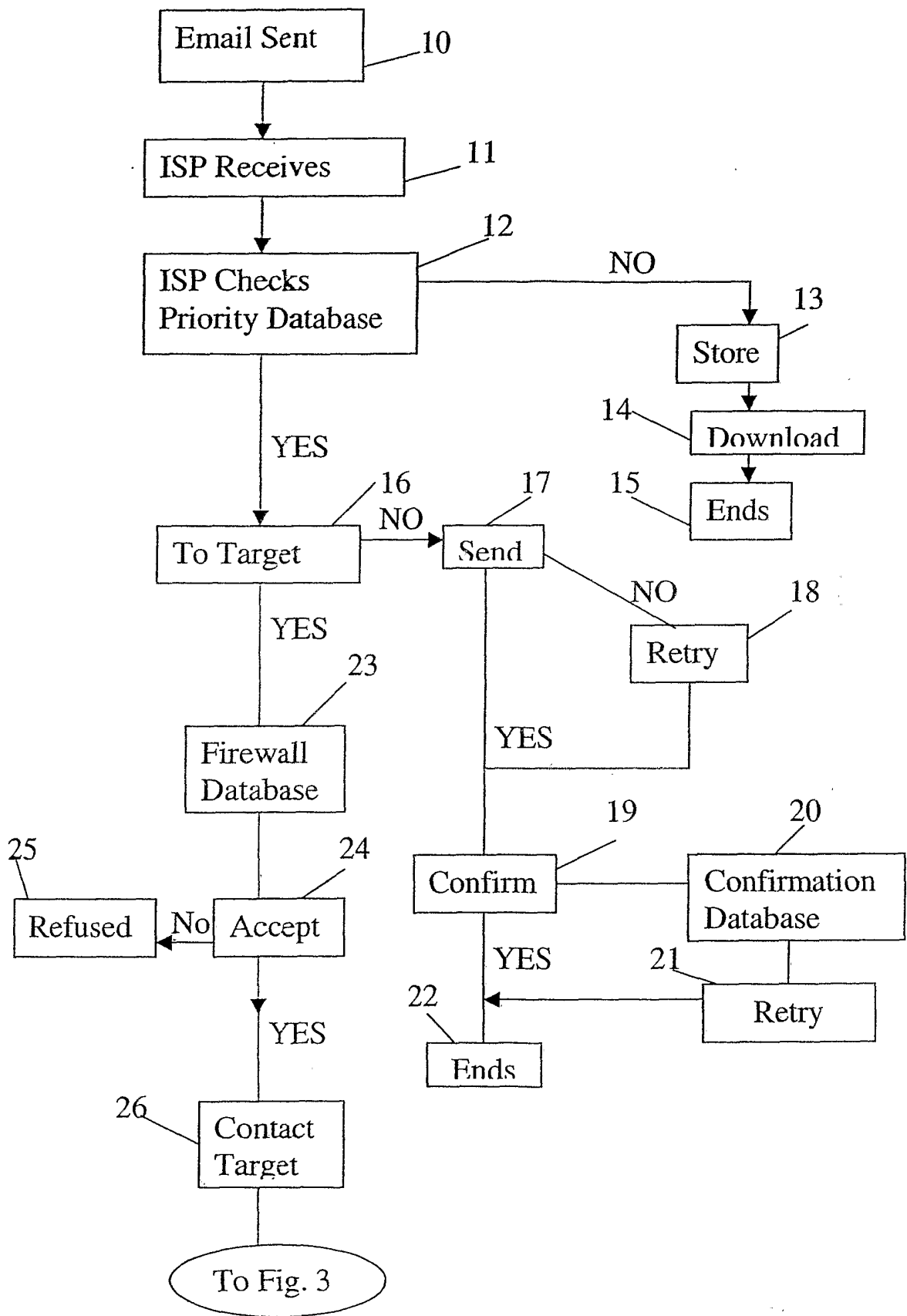


Fig. 2

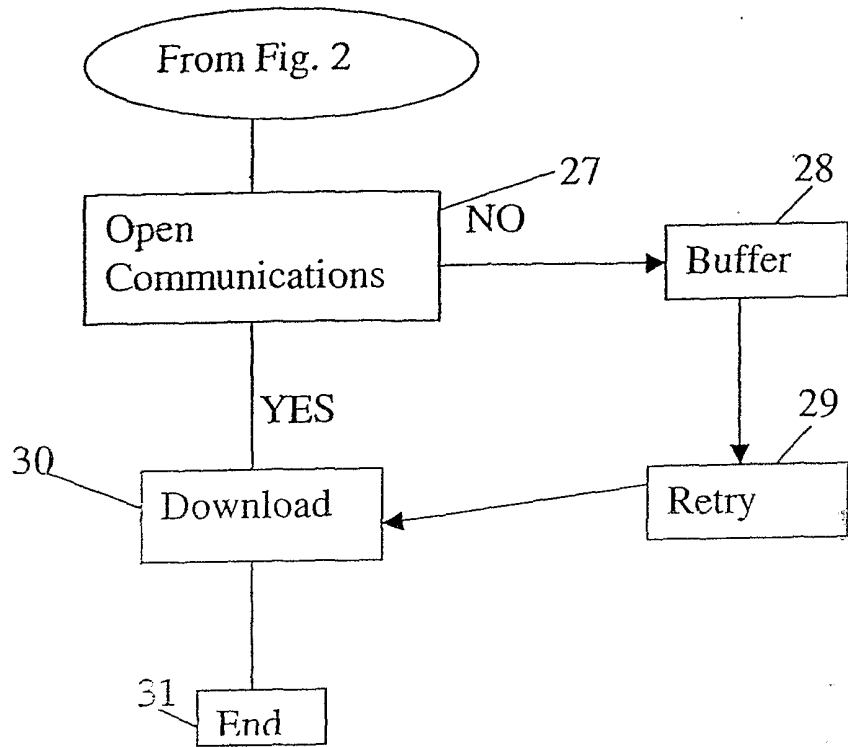


Fig. 3

INTERNATIONAL SEARCH REPORT

International Application No

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A. CLASSIFICATION OF SUBJECT MATTER IPC 7 H04L12/58 H04L12/12		
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		
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		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
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	-/--	
<input checked="" type="checkbox"/>	Further documents are listed in the continuation of box C.	<input checked="" type="checkbox"/>
		Patent family members are listed in annex.
° Special categories of cited documents :		
<p>*A* document defining the general state of the art which is not considered to be of particular relevance</p> <p>*E* earlier document but published on or after the international filing date</p> <p>*L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>*O* document referring to an oral disclosure, use, exhibition or other means</p> <p>*P* document published prior to the international filing date but later than the priority date claimed</p> <p>*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>* & * document member of the same patent family</p>		
Date of the actual completion of the international search		Date of mailing of the international search report
10 September 2001		18/09/2001
Name and mailing address of the ISA European Patent Office, P.B. 5616 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016		Authorized officer Köppl, M

INTERNATIONAL SEARCH REPORT

International Application No

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