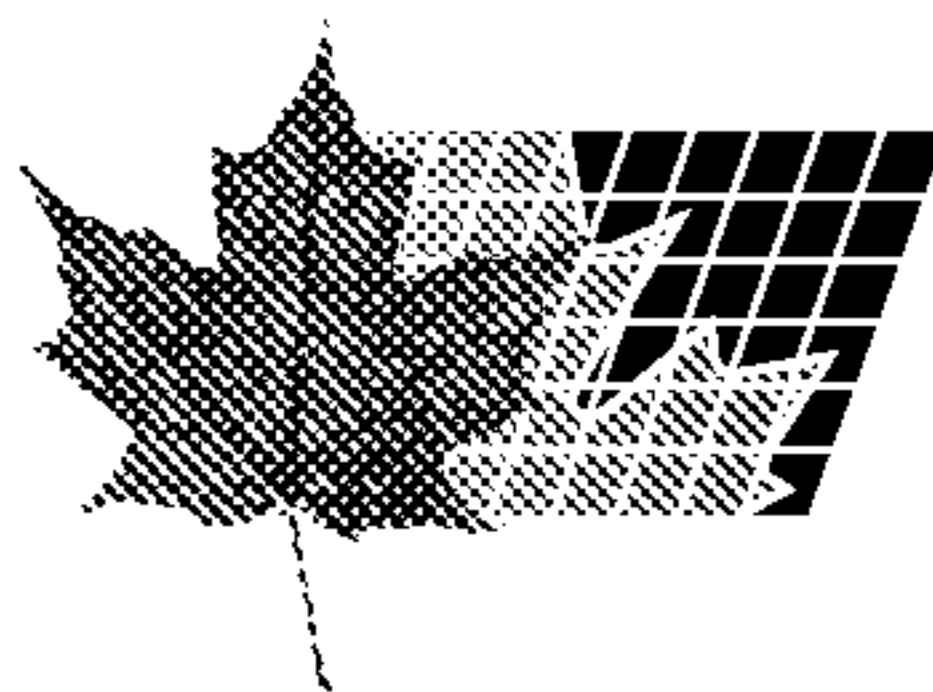




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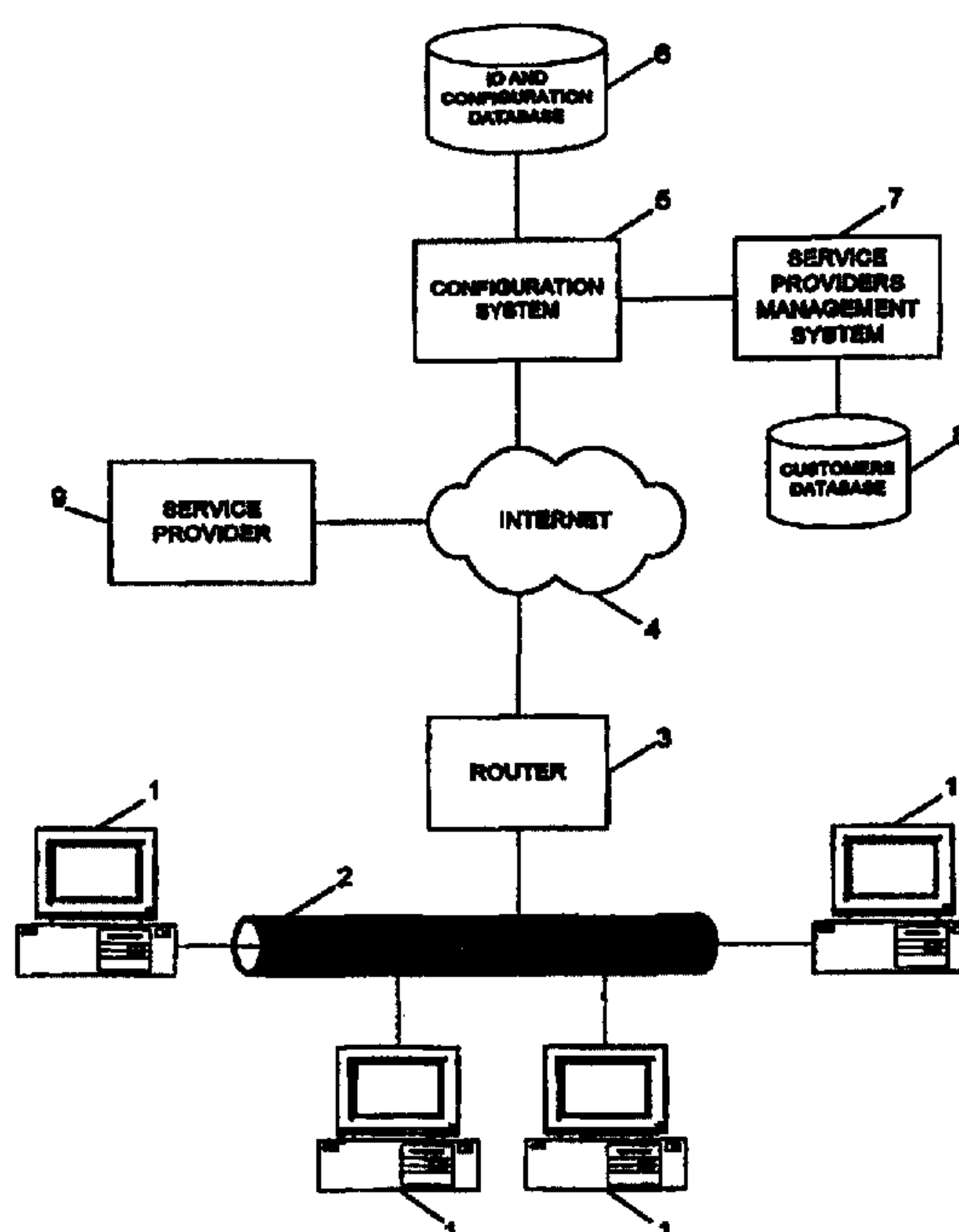
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(54) **APPAREIL ET PROCÉDE DE COMMANDE D'ACCES A UN
SERVICE VIA UN SYSTEME DE COMMUNICATION**

(54) **AN APPARATUS AND METHOD FOR CONTROLLING ACCESS
TO A SERVICE OVER A COMMUNICATIONS SYSTEM**



(57) L'invention concerne un appareil de commande d'accès à un service via un réseau de communication qui comprend une interface de connexion à une ligne de télécommunication du réseau, une mémoire servant à mémoriser un nombre de série unique et des données de configuration, ainsi qu'un processeur servant à commander l'interface pour communiquer avec un système de configuration à distance lorsque l'appareil est d'abord connecté à la ligne de télécommunication et transmet ensuite le numéro de série unique. Les données de configuration en provenance du système de configuration à distance sont stockées dans la mémoire. L'appareil est ensuite réinitialiser pour utiliser les données de configuration en vue de communications futures de manière à accéder à un service via le réseau.

(57) Apparatus for accessing a service over a communication network comprises an interface for connection to a communication line of the network, a memory for storing a unique serial number and configuration data, and a processor for controlling the interface to communicate with a remote configuration system when the apparatus is first connected to the communication line and to then transmit the unique serial number. Configuration data is received from the remote configuration system and stored in the memory. The apparatus is then reinitialised to use the configuration data for future communications to access a service over the network.

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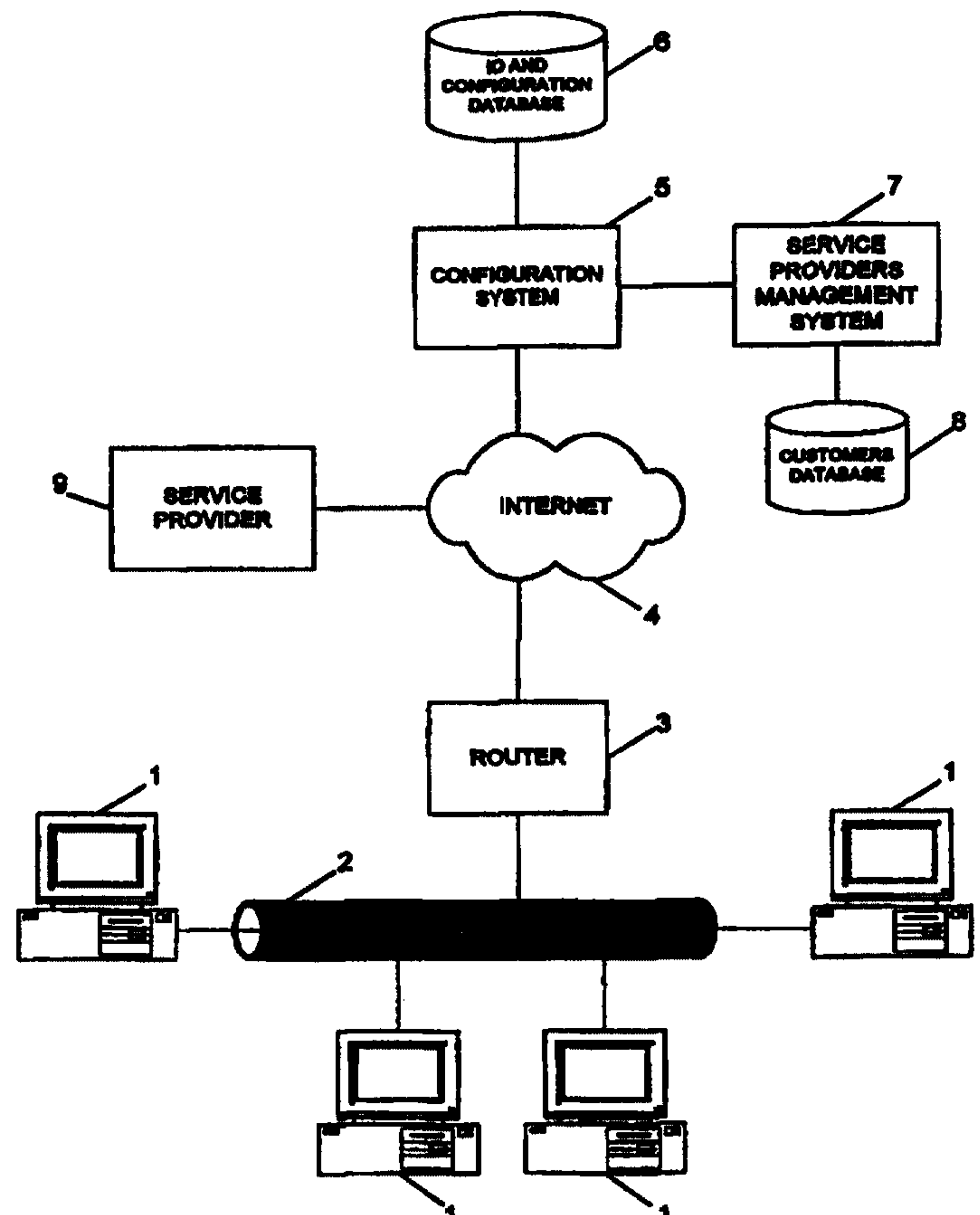
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(54) Title: AN APPARATUS AND METHOD FOR CONTROLLING ACCESS TO A SERVICE OVER A COMMUNICATIONS SYSTEM

(57) Abstract

Apparatus for accessing a service over a communication network comprises an interface for connection to a communication line of the network, a memory for storing a unique serial number and configuration data, and a processor for controlling the interface to communicate with a remote configuration system when the apparatus is first connected to the communication line and to then transmit the unique serial number. Configuration data is received from the remote configuration system and stored in the memory. The apparatus is then reinitialised to use the configuration data for future communications to access a service over the network.



**AN APPARATUS AND METHOD FOR CONTROLLING ACCESS TO A
SERVICE OVER A COMMUNICATIONS SYSTEM**

The present invention generally relates to a method and
5 apparatus for controlling access to a service over a
communication system.

With the ever-increasing use of networks of computers
there is an increasing need to simplify the setting up
10 of a network and to more efficiently monitor the
operation of the network.

One method by which computers can be networked over large
distances is by using the telecommunications network.
15 The prime example of this is the internet. The
interconnections into the internet can either be via
conventional analogue lines, via the integrated services
digital network (ISDN) or via a permanent connection such
as a leased line. An alternative network comprises the
20 frame relay network that allows for high data transfers
and requires a permanent connection.

A problem with interfacing to a communications network
in order to access a service is that the interface
25 apparatus must be configured for communication.
Conventionally this is carried out manually requiring a
user to either follow a series of steps, and/or to have

some knowledge of networking.

When a service is provided over a network, the service provider will collect and process statistics on events surrounding the usage of the service by each user. This requires the service provider to gather and process a large amount of data and if a user wishes to obtain any of the statistics related to access to the service by the user, the user must request this information from the service provider whereupon the service provider can transmit the information to the user.

It is an object of one aspect of the present invention to overcome the problem of configuring apparatus for accessing a service by providing an apparatus which can automatically configure itself and can be automatically and remotely configured.

Thus in accordance with the first aspect the present invention is concerned with communication apparatus for interfacing to a communication network in order to access a service wherein unique identification information which is stored in a memory is transmitted over the network to a remote configuration system the first time the apparatus is connected to the network. The remote configuration system determines appropriate configuration data which is transmitted back to the apparatus and stored for future use. The configuration data will be

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used by the apparatus in order to configure the apparatus for accessing the service. The remote configuration system automatically determines subsequent configuration data which it transmits to the communication apparatus.

5 This is stored for future use by the communication apparatus.

Thus this aspect of the present invention removes the need for a user to have any knowledge of networking or

10 to have to undergo any steps in configuring the apparatus to access a service. At the time of purchase, the user will subscribe to a service whereupon a third party responsible for configuring the apparatus remotely is given information on the user, the unique identifying

15 information for the apparatus, and possibly the level and/or type of service required by the user. The third party can comprise the service provider or any third party delegated by a service provider to provide the configuration service. Using the information on the

20 level and/or type of service required for the user, and the unique identifying information, configuration data can thus be generated at a remote configuration system ready to be downloaded to the apparatus when it is first connected. The apparatus will be pre-configured with

25 data which instructs the apparatus to automatically connect to the remote configuration system when it is first connected in order to obtain the configuration data. In a telecommunications network for example the initially set configuration data can cause the apparatus

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to dial a telephone number which connects automatically to the remote configuration system. In a fixed network the configuration data could simply instruct the apparatus to make a connection to a particular address
5 in the network.

The apparatus can be incorporated within a computer system to control the communications between the computer system and the service. Alternatively, the apparatus can
10 comprise an interface between a computer system and a communications network. The computer system can comprise a single computer or a network of computers for example networked by a local area network.

15 The interconnection between the apparatus and the service can be made via any form of network. In one embodiment a communication connection made to the apparatus comprises at least one ISDN line. In such an arrangement a D channel can be used for permanent connection between
20 the apparatus and the network whilst the B channels can be used as necessary for communications. In this way the D channel can allow for permanent monitoring of the apparatus by a remote system such as the service provider or some form of management system. The subsequent
25 configuration data can be sent using the D channel at any time without the user having to make a connection using the B channels.

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It is an object of another aspect of the present invention to reduce the processing of communication information by the service provider and to reduce the flow of communication control data over the network.

In accordance with this aspect, the present invention is concerned with apparatus for communicating with a remote system over a network to access a service wherein information on the usage made of the service by the computer system is gathered, processed, locally stored, and then transmitted to a remote management system.

In one embodiment the remote management system comprises the service provider and thus by locally processing the information and only transmitting the processed information, not only is the processing requirements of the service provider reduced, but also the amount of information which must be transmitted is reduced. Further, since the processed information is locally stored, it is readily accessible by users of the apparatus.

The information which can be gathered can comprise for example the number of bytes transmitted and received, the number of frames transmitted and/or received, the number of errors, and the number of calls made over a telecommunications line.

In one embodiment the apparatus includes a clock such that the information can be gathered with respect to time and the processing can be carried out periodically to generate summary information which summarises the information on the communications made.

To allow a user local access to the processed information, a user interface is provided which can take any convenient form such as a serial interface, or more conveniently the apparatus can operate a computer program to provide the user interface which can comprise a Graphical User Interface (GUI) such as a web page. In such an arrangement a machine independent program e.g. a Java applet can be run in order to obtain the processed information and arrange it for output to the user in a graphical user interface form such a web page.

Configuration data initially set in the apparatus, or configuration data obtained remotely in accordance with the first aspect of the present invention can determine the processing carried out on the gathered information.

Embodiments of the present invention will now be described with reference to the accompanying drawings in which:

Figure 1 is a schematic drawing of a generalised system in accordance with an embodiment of the present invention;

Figure 2 is a schematic drawing of an arrangement using the frame relay network in accordance with an embodiment of the present invention;

Figure 3 is a schematic drawing of an arrangement using the internet in accordance with an embodiment of the present invention;

Figure 4 is a functional diagram of the apparatus in accordance with an embodiment of the present invention;

Figure 5 is a schematic drawing of the apparatus in accordance with an embodiment of the present invention; and

Figure 6 is a flow diagram illustrating the steps involved in configuring the apparatus in accordance with an embodiment of the present invention.

Referring now to Figure 1, this diagram illustrates a generalised system in accordance with an embodiment of the present invention wherein a computer system 100 is connected via an interface 200 to a network 300 in order to access a service 400. A management system 500 is

provided connected to the network 300 in order to control access to the service and to provide configuration data for the interface 200 as required.

- 5 Although the computer system 100 and interface 200 are shown in Figure 1 separately, the interface 200 can be combined within the computer system 100.

10 Figure 2 illustrates schematically a more specific embodiment of the present invention which utilises the frame relay network. In this embodiment computers 10 are networked over a local area network (LAN) (11) which is provided with an interface 12 which is connected to an ISDN network 13 via a basic rate ISDN (BRI) line. The
15 ISDN network 13 is connected to the frame relay network via a primary rate ISDN (PRI) line. A remote computer system 16 is connected to the frame relay network 14 using the frame relay (FR) line and a configuration centre 15 is provided also connected to the frame relay
20 network 14 for providing configuration data to the interface 12.

In this embodiment when the interface 12 is initially installed it is configured to dial into the frame relay
25 network 14 via the ISDN network 13 in order to obtain configuration data from the configuration centre 15. The automatic configuration capability in this arrangement

removes the necessity for the user of interface 12 to have any knowledge or understanding of the network to which the interface 12 is being connected. The interface 12 is initially configured (factory set) to connect to the configuration centre 15 which will have been provided with information on the service required by the user of the interface 12 and the unique serial number of the interface 12 e.g. at the point of purchase. In this way once the interface 12 has connected to the configuration centre 15, it will transmit its unique serial number whereupon the configuration centre 15 will determine e.g. look up the required configuration data for transmission back to the interface 12. Once the interface 12 has received the new configuration data, this can be used for all future communications in order to connect to the remote computer system 16. The re-configuring of the interface 12 can take place by a re-initialisation of the interface 12, by a reloading of the controlling software and configuration data, or simply by re-reading the configuration data.

Figure 3 illustrates an alternative embodiment of the present invention wherein computers 1 are connected over a local area network which in this embodiment comprises an ethernet 2. A router 3 is connected to the ethernet 2 to interface the ethernet 2 to the internet 4. A service provider 9 is connected to the router 3 via the

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internet 4 and a configuration system 5 is also connected to the internet 4 and accessible to the router 3. The configuration system 5 is provided with a database 6 of configuration data for each router serial number. Also
5 Figure 3 illustrates the presence of a service provider's management system 7 and a customer's database 8.

The operation of this system will now be described with reference to the flow diagram of Figure 6. When the
10 router 3 is purchased or soon thereafter and before first connection to access the service, the user registers with the service provider. The registration takes the form of providing the service provider with the serial number of the router, details of the user, and possibly
15 information which identifies the level or type of service required from the provider. Of course, where the provider only provides one level of service i.e. a simple connection, there is no need for this information since it is assumed that if the user is registering connection
20 is required. Such information provided to the service provider is typically held in a customer database 8. The service provider's management system 7 will contain the customer details not just for the purposes of configuration, but also for general management purposes
25 such as billing. The information can then be passed from the service provider's management system 7 into the configuration system 5 which can comprise a separate

computer. Alternatively, the functions of the configuration system 5 and the service provider's management system 7 could be combined. With the information on the level and/or type of service required and the serial number of the router, the configuration system can then determine suitable configuration data and install this in the database 6. Of course, as new routers are purchased for use in accessing the service, this process of determining suitable configuration data will be repeated to build up the database 6.

When the router is connected to the internet via for example an ISDN line, the router automatically dials the configuration system and when the connection is made it transmits its unique serial number. The serial number can be encoded for security purposes before being transmitted. When the configuration system receives the serial number, if it is encoded it is decoded and it then goes through a verification process to determine whether it is a valid serial number. If validation is successful the configuration system refers to the database 6 to look up the appropriate configuration data which is then transmitted to the router 3 for storage in the local memory. The transmitted configuration data can be suitably encoded before transmission for security purposes. The connection by the router to the configuration system 5 can then be terminated and the

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router can then configure itself in accordance with the newly downloaded configuration data. This can be achieved by a re-initialisation of the router, a reloading of the control software and configuration data, 5 or simply by re-reading the configuration data. Once this has been carried out, the router is now configured for future access to the service provided by the service provider 9 i.e. the configuration data has set up the router to dial the correct telephone number to be 10 connected to the service provider, it has loaded a user name and password into the router for transmission to the service provider, and it has set up other connection parameters required for communication between the router and the service provider.

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Since in Figure 3 the router 3 comprises a LAN access router, users of the computers 1 looking to access the services of the service provider 9 will be able to do so seamlessly via the router 3. None of the users of the 20 computers or the network manager of the local network need carry out any steps in configuring the LAN access router initially. Also, it is possible for the configuration system 5 to amend or update the configuration data in the router 3 remotely without the 25 need for the local users or local network manager to do anything. One reason for updating the configuration data may be that the connection parameters have changed e.g.

the telephone number for the service provider is changed or the data rate. In such circumstances the configuration system 5 may automatically download new configuration data to the router 3 for subsequent use.

5 Alternatively, where a service provider 3 provides different levels of service or possibly even a different service provider is required by the user of the router 3, the user will have contacted the service provider requesting a new or updated level of service. This will

10 of course result in new or updated configuration data in the database 6 which will be automatically downloaded to the router 3. It may also be possible for the user of the router 3 i.e. the local network management to make an online request for updated configuration data.

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In this embodiment the connection between the network 4 and the router 3 can be via any form of convenient communication line e.g. a conventional analogue line, an ISDN line, or a permanent communication line. If the

20 communication line is analogue, of course the router will include a modem. Where an ISDN line is available, this will provide a high data rate without the cost of a permanent line. Also, since an ISDN line includes a data (D) channel which can be permanently open for

25 communications of data, the configuration system 5 can use the D channel for downloading configuration data to the router 3.

The configuration system 5 can comprise a workstation running a configuration setup application. The database 6 can be provided within the workstation using any suitable database software such as Microsoft's SQL
5 database software. In order to provide a convenient interface to the user the server can run Microsoft's Internet InfoServer to provide a web interface. The workstation will also operate as a file transfer protocol (FTP) server for the transfer of the configuration data
10 to the router 3.

Although in Figure 3 the configuration system 5 is illustrated as being directly connected to the internet 4, the workstation may be connected to a LAN which has
15 a router connected thereto. Any method of connecting the configuration system 5 to the internet can be used which allows for the router 3 to connect directly into it to obtain configuration data. Thus, although the configuration system 5 is most likely to be operated by
20 the service provider, it need not be and can be operated by a third party.

In the configuration system, in order to form the configuration data there are three levels of
25 configurations to be considered and these are (1) configuration parameters for the hardware of the router, (2) configuration parameters specific to the provider's

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service and (3) parameters specific to the requirements of the user. In the specific embodiment the Microsoft Internet Information server acts as interface between the operator of the system and the Microsoft SQL database to
5 allow for the parameters to be entered into the database to form the configuration data.

Although Figure 3 illustrates that the router 3 has only one communication line to the internet, it may have a
10 number of communication lines for simultaneous communication to a number of service providers and possibly to a number of configuration systems. Thus, the router 3 will be capable of storing within its memory a configuration file for each communication line which
15 communicates to a service provider. Further, the router may not be limited to a single service provider and thus more than one set of configuration data may be provided (or a set of configuration data with options for different service providers) can be stored within its
20 memory and the router may enable a user to select the service provider to be accessed.

Although Figure 3 illustrates the router as interfacing a local area network to the internet, the router 3 may
25 in fact comprise a simple interface between a single computer system and the internet.

In a conventional network arrangement when a service provider provides a service over the internet to a user, it gathers statistics (i.e. information on events caused by access made by the user) and processes this raw statistical data into more useful summary data. This conventional method of gathering statistical information requires the service provider to continuously retrieve data from the user which stores the raw gathered statistics locally. If a user required summary information it was necessary previously to request this information from the service provider who would then download it to the user. In this embodiment the limitations of the prior art are overcome by providing for local processing of the gathered statistics so that this information can be made available locally and can be periodically uploaded to the service provider. Thus, the amount of information which needs to be passed up to the service provider is reduced, the processing load of the service provider is reduced, and processed statistics are readily available to the user.

In an embodiment of the present invention a manager of the router 3 such as a local area network manager is provided with a user interface which can comprise a web server allowing any one of the computers 1 to enter a URL to access a web page which will display the processed statistics. The processed statistics available to the

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user can be processed in accordance with machine independent code which conveniently comprises a Java applet. In addition to this method of interfacing using the local area network 2, the router 3 can be provided
5 with a serial interface to allow local management e.g. the entry of configuration data or to obtain statistics.

In the router a log file is formed in memory which records each communication event and parameters of each
10 event. These parameters can be accessed locally via the user interface and are processed to form summary information which is also available locally via the user interface. The processed statistics will periodically be transmitted to the service provider. The statistics
15 can comprise the number of bytes transmitted and received, the number of frames transmitted and received, the number of errors, and the number of calls made. The configuration file which is remotely downloaded and includes parameters specific to the service provider,
20 will determine how often the raw statistical data is captured, what raw statistical data should be captured, and how many samples are to be kept. The number of variables and number of samples to be kept are limited by the memory capacity of the router 3 and this will be
25 taken into consideration by the configuration system during the formation of the configuration data since it will have all the information necessary to form the

appropriate configuration data.

The statistical processing is carried out by capturing events and synchronising these events with the operation
5 of a real time clock. This generates a table of raw statistical data. When the table of raw statistical data is full, the data is processed in accordance with the configuration data to form summary data in a summary table. It is this summary data in the summary table
10 which can be viewed by the user interface and the type of user interface can be determined by the configuration data.

Referring now to Figure 4, there is illustrated a
15 functional diagram of the router 3. A LAN port 30 interfaces the router 3 to the LAN. A router 32 is provided for communications which are to be routed to/from the LAN from/to the service provider and an ISDN port 35 is provided for interface to the
20 telecommunications network. A factory configuration 33 is initially set within the router which initiates an auto-configuration process 34 which causes the router to dial the remote configuration system and transmit its unique serial number. Configuration data 37 is thus
25 received a process 36 for configuring the router configures it for future communications. For all future communications a log function 40 logs communication

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events to form log data 38. This forms part of the raw statistical data 43 which is processed by a statistics processing procedure 42 to generate processed statistics 41. A user interface 31 provides access for a user to
5 the raw statistical data, the log data, and the processed statistics. The type of user interface is initially dependent upon the factory configuration and subsequently to the downloaded configuration data. The processed statistics 41 is not only available to the user interface
10 31, it is also available via the ISDN port 35 to the service provider.

Figure 5 illustrates schematically the structure of the router 3 in accordance with an embodiment of the present
15 invention. A LAN interface is provided for connection to a LAN. The interface provides a network manager with access to the raw and processed statistical data and also allows for users to access the service provided by the service provider. A serial interface 26 is also provided
20 for management and allows a manager to access not only the raw and processed statistical data but also the configuration data.

A real time clock 20 is provided for timing the recordal
25 of events to form the statistical data for processing by the central processing unit 21. A dynamic random access memory 22 is also provided to act as the working memory.

Flash memory is provided for storing the programs for carrying out the configuration of the router, for carrying out the statistical processing, for routing the communications and for providing the user interface.

5 Also the configuration data is stored in the flash memory 23. This can comprise the initial factory configuration data and one or more sets of subsequently downloaded configuration data. Also, the serial number is stored in the flash memory 23. A battery-backed static RAM 24

10 is also provided for storing the statistical data such as the event log and the call log. An ISDN interface 29 is provided for interfacing to a basic rate ISDN (BRI) line and two plain old telephone service (POTS) interfaces 27a, 27b provide two analogue telephone lines

15 (one for each of the two B channels of the BRI line) for use by telephones 28a and 28b.

Although the present invention has been described hereinabove with reference to specific embodiments, the

20 present invention is not limited to such embodiments and variations will be apparent to a skilled person in the art. For example, although the interface to a computer system has been described with reference to a LAN interface, any interface can be used e.g. a serial

25 interface such as an RS232 interface or a USB (universal serial bus). Further, more than one interface can be provided both to the computer system and to communication

lines. The communication lines can be any form of network communication lines such as a permanent leased line, an ISDN line, or a simple analogue line. Also, different services may be available for users on
5 different communication lines provided for by different communication data for those lines.

CLAIMS:

1. A method of remotely configuring communication apparatus for communication over a network to access a service, the method comprising the steps of:
- 5 connecting said communication apparatus to said network;
- said communication apparatus automatically communicating with a remote configuration system over
- 10 said network using initial configuration data;
- said communication apparatus transmitting unique identification information to said configuration system;
- at said configuration system determining configuration data for said communication apparatus;
- 15 transmitting said configuration data to said communication apparatus;
- storing said configuration data received from said configuration data in storage means in said communication apparatus;
- 20 controlling subsequent communications by said communication apparatus over said network using the stored configuration data;
- transmitting subsequent configuration data to said communication apparatus automatically from said
- 25 configuration system;
- storing said subsequent configuration data in said storage means; and

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controlling subsequent communications by said communication apparatus over said network in accordance with the stored subsequent configuration data.

5 2. A method according to claim 1, including the steps
of a user of said communication apparatus generating a
request for further subsequent configuration data, and
transmitting said request to said configuration system
to initiate the transmission of subsequent configuration
10 data.

3. A method according to claim 1 or claim 2, wherein
said configuration data is transmitted over said network
using a permanently open control channel associated with
15 a plurality of data/voice channels.

4. A method according to any one of claims 1 to 3,
including the steps at said communication apparatus, of:
gathering information on the use of said service;
20 processing said information to generate summary
information; and
periodically transmitting said summary information
to a provider of said service.

25 5. A method according to claim 4, wherein said
information is gathered in real time using a real time
clock.

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6. A method according to claim 4 or claim 5, including the step of supplying said information and/or said summary information to a user.

5 7. Communication apparatus for use in the method of claim 1 for interfacing a computer system to a communication network to access a service, the apparatus comprising:

10 first I/O means for connection to said computer system;

second I/O means for connection to the communication network;

15 storage means for storing unique identification information and configuration data for configuring the operation of the apparatus to access said service over said communication network;

20 processing means for controlling said second I/O means the first time said second I/O means is connected to said communication network to connect to a remote configuration system and to transmit said unique identification information in said storage means to the configuration system;

25 wherein said processing means is operable to control said second I/O means to initially receive configuration data from said configuration system, to store said initially received configuration data in said storage means, and to control access to said service by said

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computer system in accordance with said initially received configuration data; and

wherein said processing means is operable to control said second I/O means to receive subsequent configuration data automatically generated by said configuration system, to store said subsequent configuration data in said storage means, and to control subsequent access to said service by said computer system in accordance with said subsequent configuration data.

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8. Communication apparatus according to claim 7, wherein said first I/O means comprises a local area network port for connection to a local area network.

15 9. Communication apparatus according to claim 7 or claim 8, wherein said second I/O means comprises an ISDN port for connection to one or more ISDN lines in said communications network.

20 10. Communication apparatus according to claim 9, wherein said second I/O means is adapted for connection to an ISDN line having a data channel (D) and a plurality of bearer channels (B).

25 11. Communication apparatus according to claim 9 or claim 10, including at least one plain old telephone

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service (POTS) interface for connecting a telephone to the or each ISDN line.

12. Communication apparatus according to any one of
5 claims 7 to 11, including user interface means for
allowing a user to generate a request for further
subsequent configuration data, said processing means
being responsive to said request to control said second
I/O means to transmit said request to said configuration
10 system to cause further subsequent configuration data to
be transmitted to said apparatus.

13. Communication apparatus according to any one of
claims 7 to 12, wherein said second I/O port means
15 comprises an ISDN interface for connection to one or more
ISDN lines of an ISDN network having one or more data
channels permanently connecting said ISDN interface to
the ISDN network, and for receiving said subsequent
configuration data using said data channel.

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14. Communication apparatus according to claim 13,
wherein said ISDN interface is adapted to receive said
subsequent configuration data using one or more
communication channels of the or each ISDN line.

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15. Communication apparatus according to claim 7 or claim 8, wherein said second I/O means is adapted for connection to a dedicated data communication line.

5 16. Communication apparatus according to any one of claims 7 to 15, wherein said processing means is operable to gather information on the use of said service by said computer system, to process said information to generate summary information, and to control said second I/O means
10 to periodically transmit said summary information to a provider of said service.

17. Communication apparatus according to claim 16, including real time clock means, wherein said processing
15 means is operable to use said real time clock means to gather real time information on the use of said service by said computer system.

18. Communication apparatus according to claim 16 or
20 claim 17, including user interface means to allow a user of said communication apparatus access to said information.

19. Communication apparatus according to claim 18,
25 wherein said user interface means comprises a further I/O means.

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25. Communication apparatus according to claim 7 or claim 8, wherein said second I/O means includes a modem for connection to an analogue telephone line.

- 5 26. Communication apparatus for use in the method of claim 1 for communicating with a remote system over a network to access a service, the apparatus comprising:

I/O means for connection to the network;

10 storage means for storing unique identification information and configuration data for the operation of the communication apparatus to access said service;

processing means for controlling said I/O means the first time said I/O means is connected to said network to connect to a remote configuration system and to
15 transmit said unique identification information thereto;

wherein said processing means is operable to control said I/O means to initially receive configuration data from said configuration system, to store said initially received configuration data in said storage means, and
20 to control access to said service in accordance with said initially received configuration data; and

wherein said processing means is operable to control said I/O means to receive subsequent configuration data automatically generated by said configuration system, to
25 store said subsequent configuration data in said storage

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means, and to control subsequent access to said service in accordance with said subsequent configuration data.

27. Communication apparatus according to claim 26,
5 including user interface means for allowing a user to generate a request for further subsequent configuration data, said processing means being responsive to said request to control said I/O means to transmit said request to said configuration system to cause further
10 subsequent configuration data to be transmitted to said apparatus.

28. Communication apparatus according to claim 26, wherein said I/O port means comprises an ISDN interface
15 for connection to one or more ISDN lines of an ISDN network having one or more data channels permanently connecting said ISDN interface to the ISDN network, and for receiving said subsequent configuration data using said data channel.

20

29. Communication apparatus according to claim 28, wherein said ISDN interface is adapted to receive said subsequent configuration data using one or more communication channels of the or each ISDN line.

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30. Communication apparatus according to any one of claims 26 to 29, wherein said processing means is operable to gather information on the use of said service by said computer system, to process said information to
5 generate summary information, and to control said I/O means to periodically transmit said summary information to a provider of said service.

31. Communication apparatus according to claim 30,
10 including real time clock means, wherein said processing means is operable to use said real time clock means to gather real time information on the use of said service.

32. Communication apparatus according to claim 30 or
15 claim 31, including user interface means to allow a user of said apparatus access to said information.

33. Apparatus according to claim 32, wherein said user interface means comprises a computer program running on
20 said processing means to allow access to said summary information.

34. Apparatus according to claim 33, wherein said processing means is operable to gather and process said
25 information using machine independent instructions for output to said user.

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35. Apparatus according to any one of claims 26 to 34, including encoding means for encoding said unique identification information before transmission by said I/O means.

5

36. Apparatus according to any one of claims 26 to 35, including decoding means for decoding configurating received in encoded form by said I/O means.

10 37. A configuration system for use in the method of claim 1 and for connection to said communication apparatus according to any one of claims 7 to 36 via a communication network, said configuration system comprising:

15 I/O means for connection to said communication network, and for receiving said unique identification information from said communication apparatus; and

configuration processing means responsive to said unique identification information to determine initial
20 configuration data for said communication apparatus;

wherein said I/O means is adapted to transmit said determined configuration data to said communication apparatus over said communications network; and

25 wherein said configuration processing means is operative to automatically determine updated configuration data and to cause said I/O means to

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transmit said updated configuration data to said communication apparatus.

38. A configuration system according to claim 37,
5 wherein said configuration processing means is operative to determine said configuration data using said unique identification information, information on the user or users of said communication apparatus, and information on the level of service required by the user or users.

10

39. A configuration system according to claim 38, including obtaining means for obtaining said information on the user or users, and said information on the level of service required by the user or users.

15

40. A configuration system according to claim 39, wherein said obtaining means is adapted to obtain said information on the user or users, said information on the level of service required by the user or users, and
20 expected unique identification information prior to receipt of said unique identification information by said I/O means, and said configuration processing means is operative to determine said configuration data before receipt of said unique identification information using
25 the information obtained by said obtaining means, to compare the received unique identification information

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with said expected unique identification, and to cause said I/O means to transmit the configuration data if there is a match in the comparison.

5 41. A configuration system according to claim 40, including means for storing a plurality of sets of said configuration data for a corresponding plurality of said expected unique identification information for a corresponding plurality of said communication
10 apparatuses, wherein said configuration system can connect to a plurality of said communication apparatuses.

42. A configuration system according to any one of claims 37 to 41, wherein said configuration processing
15 means is responsive to a request for configuration data received by said I/O means from said communication apparatus to determine configuration data and control said I/O means to transmit said determined configuration data.

20

43. A configuration system according to any one of claims 37 to 42, including decoding means for decoding encoded unique identification information received from said apparatus.

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44. A configuration system according to any one of claims 41 to 43, including encoding means for encoding said configuration data for transmission to said apparatus.

5

45. Apparatus for interfacing a computer system to a communication line to access a service, the apparatus comprising:

first I/O means for connection to said computer
10 system;

second I/O means for connection to said
communication line;

processing means for gathering information on the
use made of said service by said computer system, for
15 processing said information to generate processed
information, and for controlling said second I/O means
to transmit said processed information to a remote
management system; and

storage means for storing said information and/or
20 said processed information.

46. Apparatus according to claim 45, including clock
means, said processing means being responsive to said
clock means to gather said information with respect to
25 time, to process said information periodically, and to
cause said second I/O means to transmit said processed

information periodically to said remote management system.

47. Apparatus according to claim 45 or claim 46,
5 including user interface means to allow a user of said apparatus access to said information and/or said processed information in said storage means.

48. Apparatus according to claim 47, wherein said user
10 interface means comprises a further I/O means.

49. Apparatus according to claim 47, wherein said user interface means comprises a computer program running on said processing means to allow a user of said computer
15 system access to said information and/or said processed information via said first I/O means.

50. Apparatus according to claim 49, wherein said user interface means comprises said processor means operating
20 as a Web server.

51. Apparatus according to claim 50, wherein said processing means is operable to gather and process said information for output to said user using machine
25 independent instructions.

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52. Apparatus according to any one of claims 45 to 50, wherein said second I/O means is adapted to receive configuration data from said management system, and said processing means is operative to process said information
5 in accordance with said configuration data.

53. Apparatus for communicating with a remote system over a network to access a service, the apparatus comprising:

10 I/O means for connection to the network;
processing means for gathering information on the use made of said service by said apparatus, for processing said information to generate processed information, and for controlling said I/O means to
15 transmit said processed information to a remote management system; and
storage means for storing said information and/or said processed information.

20 54. Apparatus according to claim 53, including clock means, said processing means being responsive to said clock means to gather said information with respect to time, to process said information periodically, and to cause said I/O means to transmit said processed
25 information periodically to said remote management system.

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55. Apparatus according to claim 53 or claim 54, including user interface means to allow a user of said apparatus access to said information and/or said processed information in said storage means.

5

56. Apparatus according to claim 55, wherein said user interface means comprises a computer program running on said processing means to allow a user access to said information and/or said processed information.

10

57. Apparatus according to claim 56, wherein said processing means is operable to gather and process said information for output to said user using machine independent instructions.

15

58. Apparatus according to any one of claims 53 to 57, wherein said I/O means is adapted to receive configuration data from said management system, and said processing means is operative to process said information in accordance with said configuration data.

20

59. A method of monitoring communications between a communication apparatus and a remote system over a network to access a service, the method comprising the steps at said communication apparatus, of:

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gathering information on the use of said service by
said communication apparatus;

processing said information to generate processed
information; and

5 transmitting said processed information to a remote
management system.

60. A method according to claim 59, wherein said
information is gathered with respect to time, processed
10 periodically, and periodically transmitted to said remote
management system.

61. A method according to claim 59 or claim 60,
including the step of supplying said information and/or
15 said processed information to a user.

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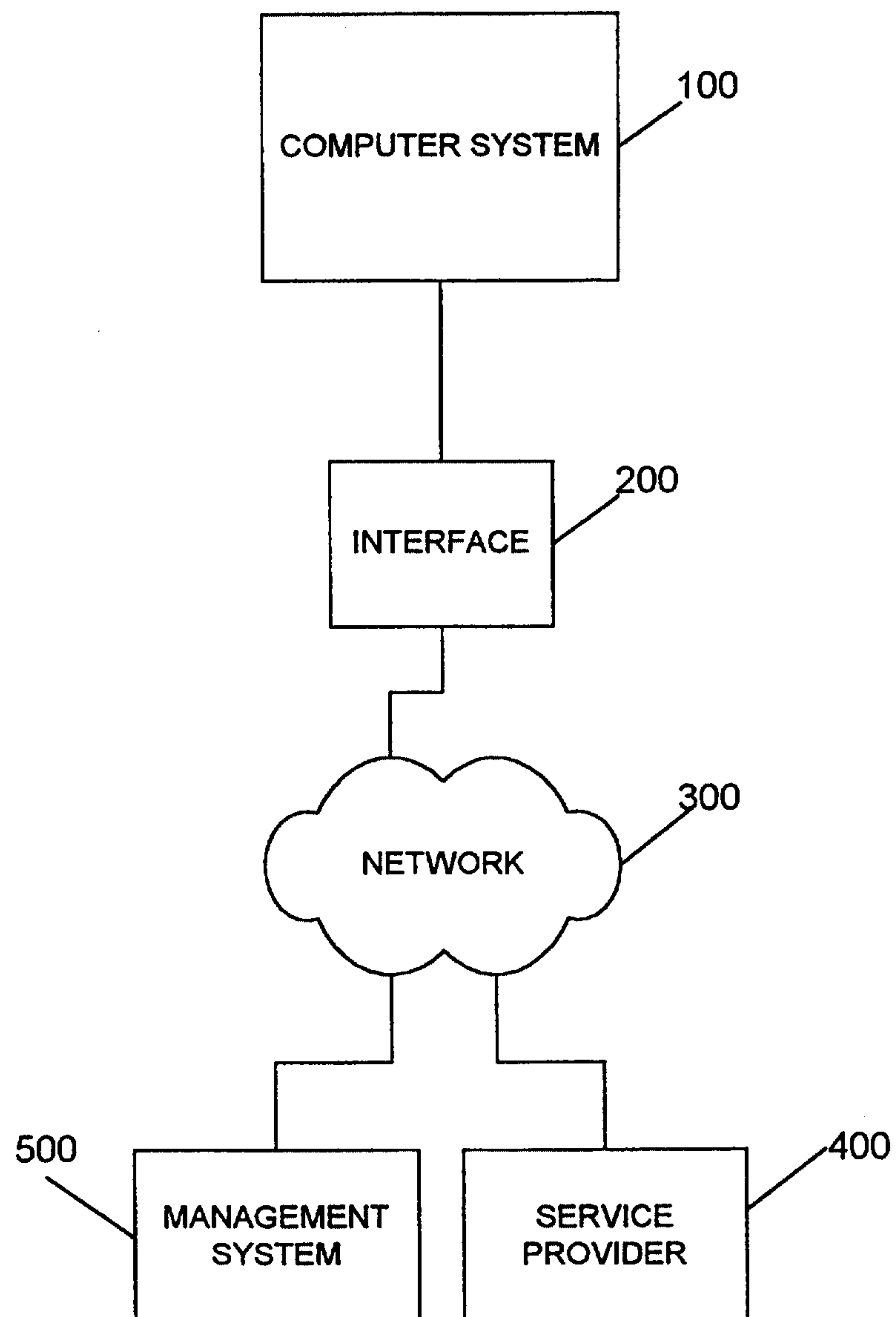


Fig 1

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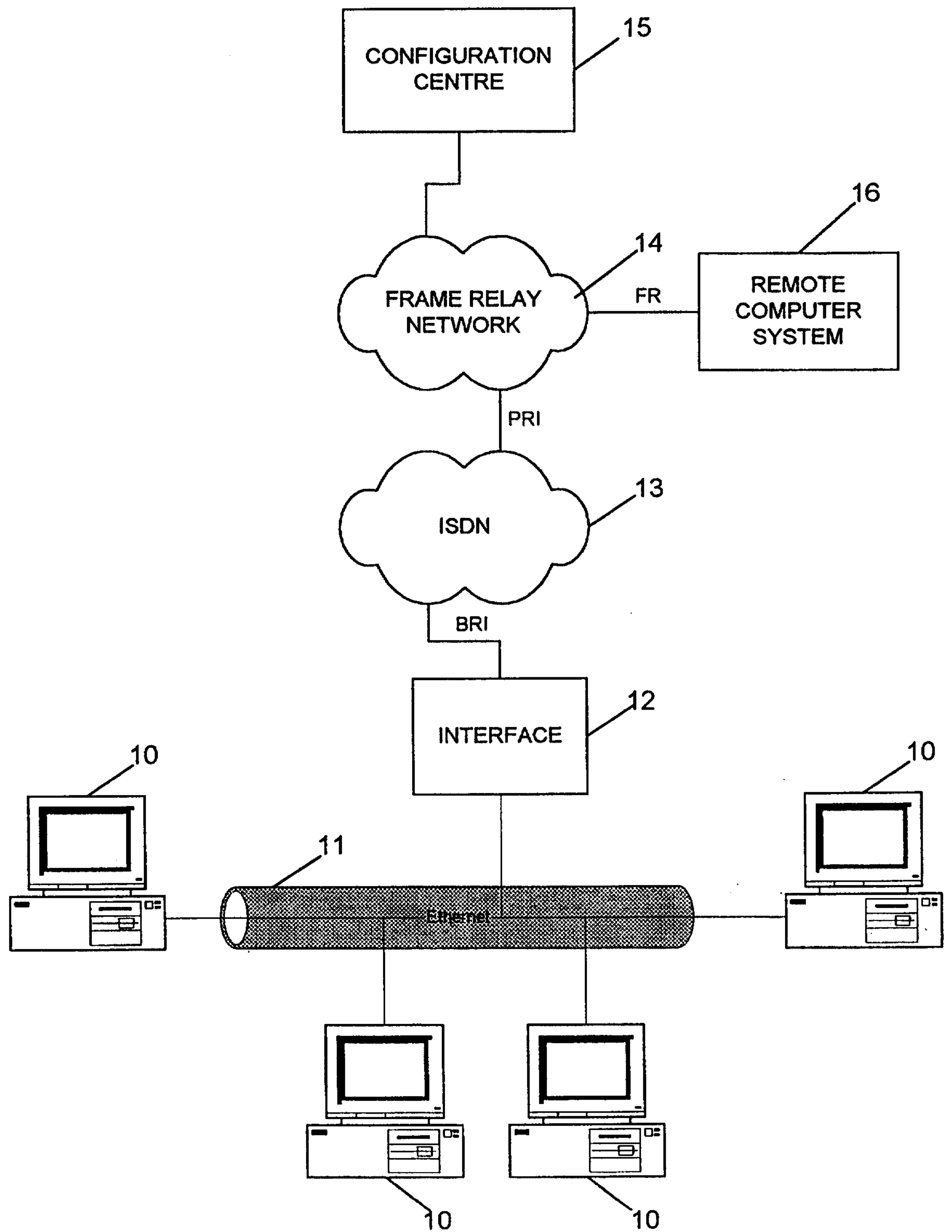


Fig 2

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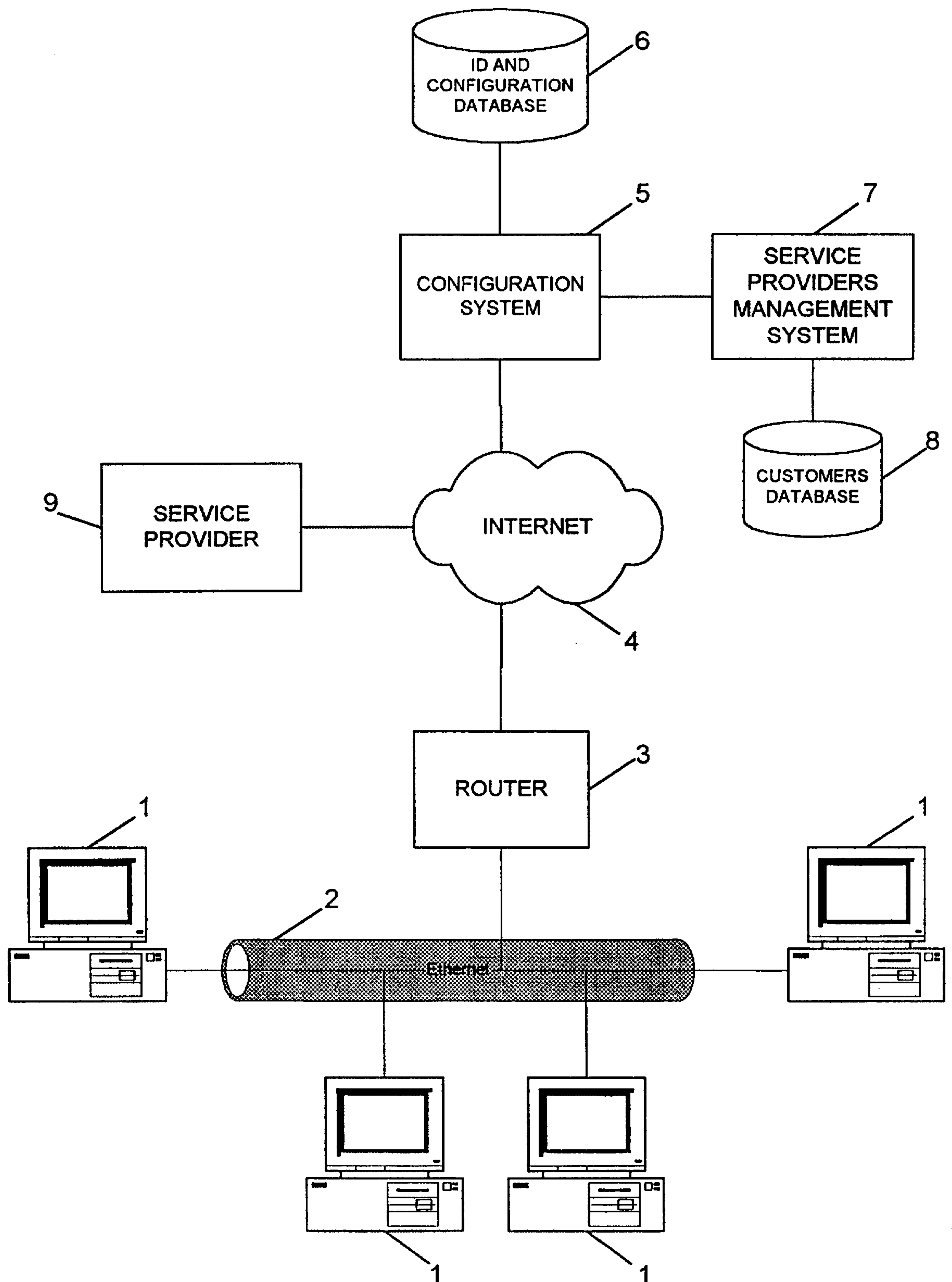


Fig 3

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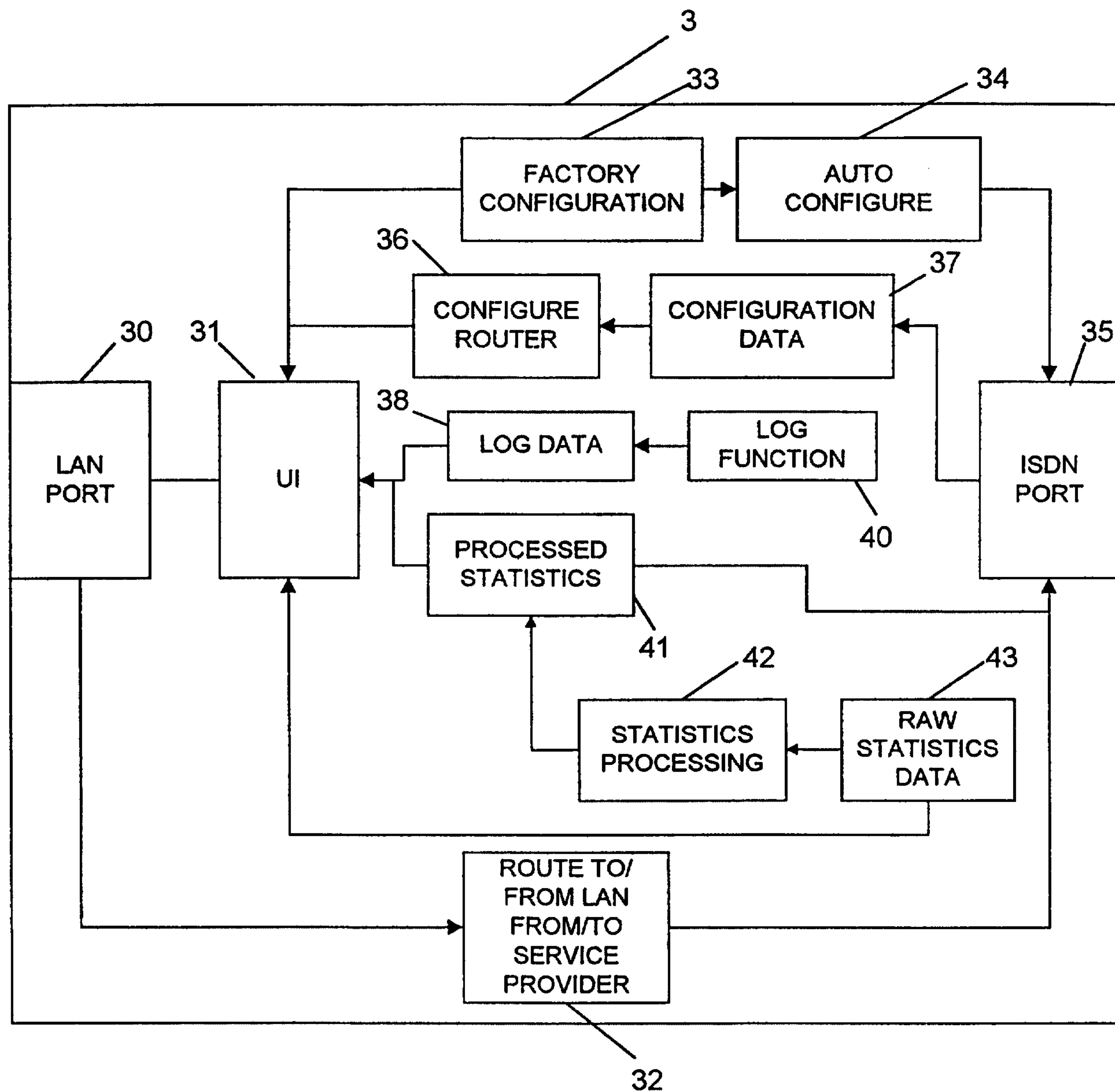


Fig 4

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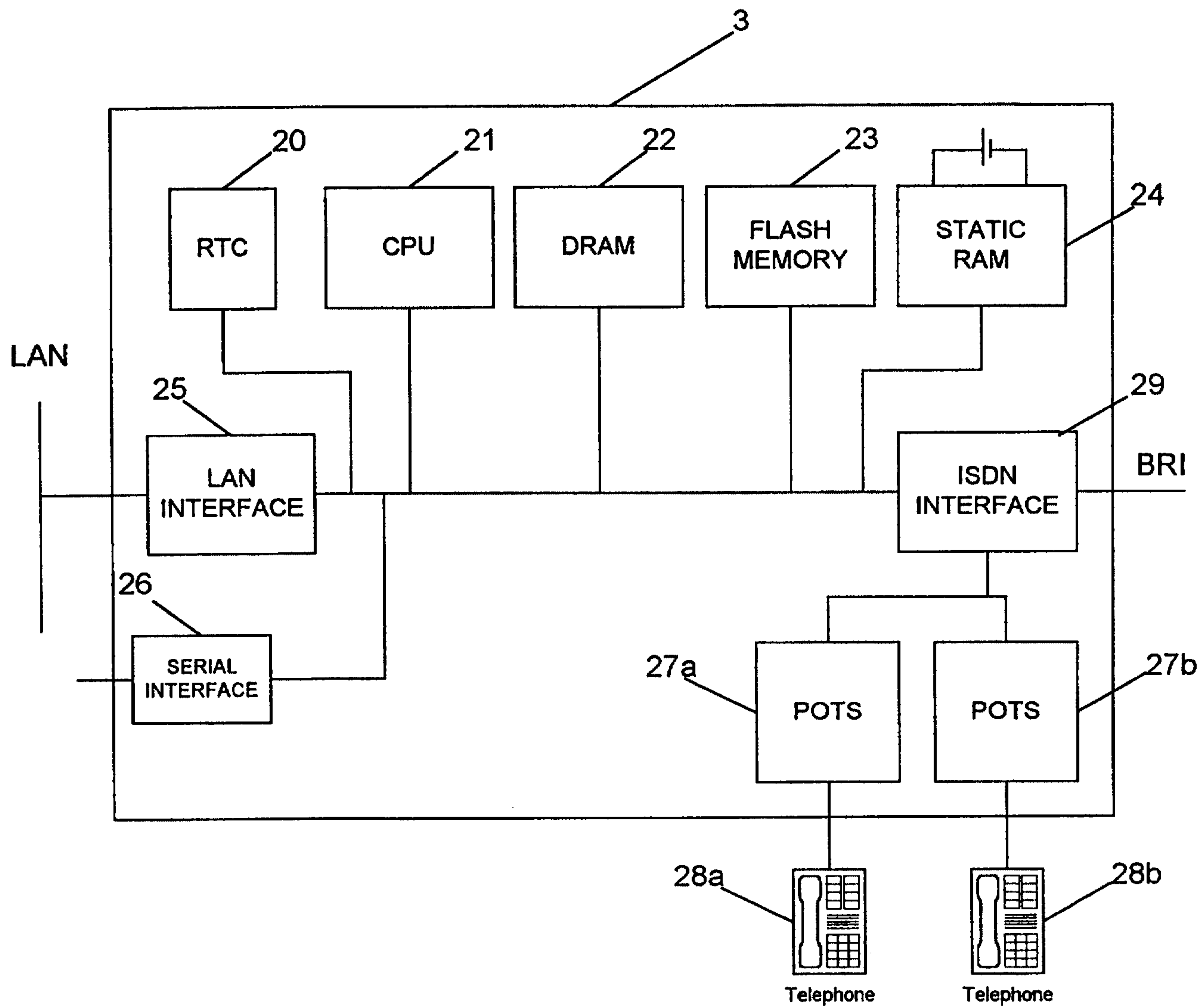


Fig 5

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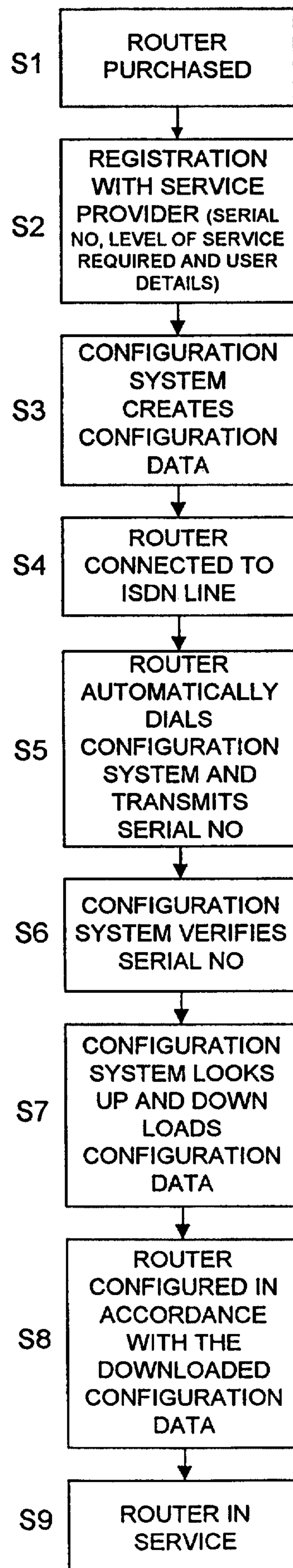


Fig 6