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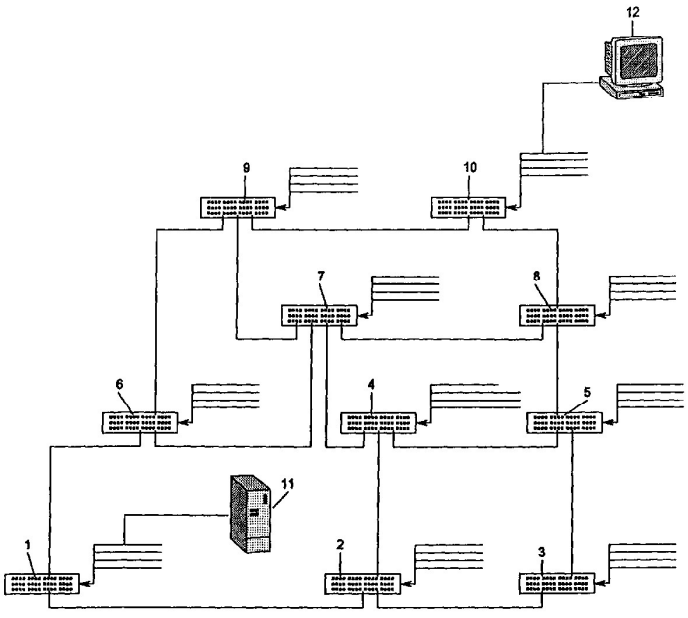
(54) **Title:** METHOD AND APPARATUS FOR IDENTIFYING LOCALE OF INTERNET USERS



(57) **Abstract:** A method for a web-server host H (11) to determine the network address of a router or other network support device (10) most directly connected to a network connected computational device M such as a PC (12). In a preferred embodiment Host (11) is able to determine the geographical location of router (10), and hence the approximate geographical location of PC (12). The host may transmit information geographically relevant to PC (12) such as advertisements for locally available goods and services.

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METHOD AND APPARATUS FOR IDENTIFYING LOCALE OF INTERNET USERS

FIELD OF THE INVENTION

The present invention is concerned a method for determining the network address of a network support device closest to a computer network accessing computational device, such as a personal computer. The invention further relates to a method for determining the approximate geographical locale of an internet accessing computational device, such as a personal computer.

BACKGROUND TO THE INVENTION

At present it is not possible for a web server to non-intrusively determine with any degree of accuracy the geographical location of users accessing it. By "geographical location" is meant the approximate locality, such as town, city, or rural region where the user is located. Consequently it is only possible for the accessed web-site to make geographically specific the information presented to a remote user on the basis of information provided by the user. For example, a user may access a web-page which provides information on entertainment available in all the capital cities of a particular country. However the user must provide information to the web-site as to the city that he/she inhabits, in order to be provided with appropriate information. The web-page can not be programmed to automatically provide information appropriate to the user's location because it is not possible to ascertain the location without the user submitting that information.

Another example where it would be desirable to be able to provide locality customised information is in the realm of internet advertising. At present when a user accesses a web page such as an internet search engine the web page provider inserts advertisements onto the page of search results. Such advertising space is sold to businesses and the revenue provides income for the web-site provider, however because the locality of the user is unknown the web page advertisements are not well targeted to the user.

The vast majority of advertisers are currently being excluded from advertising on the internet as they simply can't afford, or don't want, to target potential customers in far flung geographical locations. For example the local newspaper in Miami does not want to advertise itself to viewers in Colorado. The advertising of local product to local consumers is almost non-existent on the internet when compared with traditional media where in excess of 80% of advertising is in respect of local product offered to the local market. In particular regional businesses, which provide services only in fairly specific geographical regions, are not inclined to purchase advertising space from internet web-page providers. Recently, it has been estimated that 75% of all internet advertising inventory goes unsold, this over-supply has resulted in downward pressure on CPM prices

It is an object of the present invention to provide a method for determining the IP address of the closest internet support device, to an internet accessing machine given the IP address of the machine.

SUMMARY OF THE INVENTION

According to a first aspect of the present invention there is provided a method for determining the network address of a network support device in most direct communication with a computer network accessing computational device, said method including the steps of:

transmitting a burst of messages having a range of time-to-live (TTL) values, each message including a network address of said computational device and having a copy of its initial time-to-live value embedded as a constant value in the message, whereby response messages generated by the network support devices and said computational device in response to said burst of messages incorporate said initial time-to-live values; and

determining said address of th network support device on the basis of the type of response message received and said incorporated initial time-to-live values.

Typically the computer network is the Internet wherein Internet Protocol (IP) addresses are used to identify the network support devices and wherein the network support devices are programmed to respond to the burst of messages with response messages according to the Internet Control Message Protocol (ICMP).

Preferably the step of determining said address includes examining the response messages and extracting from said messages the address of the network support device returning a message of the ICMP_TTL_exceeded type with the highest time-to-live (TTL) value embedded as a constant value of the response messages.

The step of determining said address may include determining said address by recording the lowest TTL value embedded as a constant amongst ICMP_Echo_Reply type messages and then retrieving an originating address of a message having an embedded TTL value of one less than said lowest TTL value.

Where ICMP_machine_unreachable type response messages are received then the step of determining said address may be include determining said address by recording the originating address of an ICMP_machine_unreachable type response message.

According to a further aspect of the present invention there is provided a method for determining the approximate geographical location of a data network accessible computational device located remotely from a host, said method including the steps of:

accessing a database relating network support device identity to geographical location;

determining the identity of a network support device appearing in said table most directly connected to said computational device; and

looking up a geographical location in said database related to said determined network support device.

Preferably the method further includes the step of compiling said database by operating a website requesting remote users of the site to transmit their geographical location and from responses to said request recording provided geographical locations in association with the address of the nearest network support, said address being determined according to the previously described method of the first aspect of the invention.

The method may further include providing data to said computational device relevant to the geographical location of the computational device.

Typically said data includes advertisements in respect of goods and/or services available in the geographical location.

According to another aspect of the invention there is provided a computational device connected to the internet, the computational device including processing means operatively arranged to produce a burst of ICMP data messages having initial time-to-live values stored in a data field of each message, said processing means being further operatively arranged to determine the nearest network device to a given IP address on the basis of ICMP data messages received over the network in response to said burst.

Preferably the computational device is in communication with an electronic storage medium containing a database relating IP addresses of routers to geographical locations.

According to a final aspect of the present invention there is provided a software product stored upon a computer readable medium for execution by a computer, the software product including:

message generation instructions for generating modified ICMP messages, said messages including a constant time-to-live (TTL) value and the IP address of a remote computational device;

message transmission instructions for transmitting said modified ICMP messages to said IP address;

message reading instructions for reading response messages received in response to said modified ICMP messages;

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