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Surveillance System via the Internet

Field of Invention

The present invention relates to a surveillance system via the Internet more particularly one that allows the user flexibility to monitor a predetermined area through a computer linked at any point to the Internet.

Background Of The Invention.

- 10 Presently, in order for a user to monitor to on goings in for example a house, office or so on, a computer linked to the Internet with fixed Internet protocol (IP) address method is used.
- 15 According to this system a user will be able to communicate between two computers via the Internet. However, the user has to use a dedicated computer installed with a special program in order to do so.
- 20 Therefore the user does not have the freedom to use any computer in any part of the world which is linked to the Internet to monitor the situation of a predetermined area. Further more, monthly fee is also charged to the subscribers in addition to



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the monthly rental for the fix IP address from the local ISP (Internet Service Provider).

Moreover the above methods or any other communication via the internet does not allow the user to have access to the IP address of the remote computer which the user would like to communicate with.

Normally, conventional DHCP (dynamic host configuration protocol) processes are capable of assigning a temporary IP address. The said IP address is known as Dynamic IP address and will be assigned by the local ISP (Internet Service Provider). Each time the user login to the internet, the IP address will be different from the previous address. It changes accordingly to the computer network address assigned to it.

The user will logon into the network via the PSTN (Public Switch Telecom Network) by calling a predetermined number e.g. 1515 (TMNET). When a PC accesses the Internet for the first time, it does not have an Internet address and seeks one by broadcasting a signal to the ISP. A temporary IP address then will be assigned by the local ISP (eg. Jaring or TMNET, AOL, etc) to register the computer on the Internet upon successful connection. However it is reiterated that the assigned IP

address is only temporary as each time the user login and logout, the IP address assigned to it will be changed .

The object of the present invention is to provide means to
5 detect IP address of a remote PC. It is more specifically directed to locating accurately a computer that is connected to the Internet through dial-up access via a telecommunications network system (e.g.PSTN) with a temporary IP address (i.e. Dynamic IP address - that is controlled by the ISP) which
10 changes each time the user logon to the Internet. This invention allows the user to communication with a remote computer(s) which is already logged on to the Internet.

It is also an object of the invention to provide means to
15 monitor the on goings of a pre determined area via a computer connected to the Internet.

Summary Of The Invention

A surveillance system deployed over a public telecommunications
20 network comprising at least one surveillance device and a surveillance computer. The surveillance computer provided with an interface for linking to said at least one surveillance device; an interface enabling said computer to access a public telecommunications network; and an application executable on

said computer which, upon successful logon to the Internet, is able to gather the dynamically assigned IP address and transmit said IP address together with a code identifying any one of said surveillance computer and surveillance device to a host.

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A remote server connected to the Internet configured to host said IP address and identifying code. The surveillance system further comprising at least one user remote-monitoring computer provided with means to access said remote server via said public
10 telecommunication network, wherein said remote server provides said IP address to said remote-monitoring computer upon matching said identifying code, thus facilitating direct access to said surveillance computer by said remote-monitoring computer.

15 **Brief Description of the Invention.**

Figure 1 illustrates the prior art method of Dynamic IP address by the DHCP server.

Figure 2 shows the prior art method of connection between a surveillance computer and home computer over the Internet using
20 the fixed IP address.

Figure 3 shows the surveillance system of the present invention.

Figure 4 shows a list of dynamically assigned IP address and hosted at present invention's IP Switching (IPS) server.

Figure 5 illustrates the limitation of the fixed IP address configuration of the prior art.

Figure 6 shows the automatic wake up according to the present invention.

5 Figure 7 shows simultaneous access to the surveillance computer by multiple remote computers.

Figure 8 illustrates the means of connecting cameras to view a predetermined surrounding.

10 DETAILED DESCRIPTION OF THE DRAWINGS

Accordingly, temporary IP addresses may be assigned to a user's remote PC by way of connection between a DNS (domain name server) and the DHCP (dynamic host configuration protocol) server. This provides a scheme for mapping the IP address
15 numbers against domain names.

In order have communication between the said computer(s) and the computer located accurately by having the dynamic IP address, verification process will be carried out via the server to make
20 sure authorized personnel only will be allowed to access the computer.

To facilitate a complete understanding of the invention, the description of the preferred embodiment is arranged within the following sections:

1. GLOSSARY OF TERMS AND ACRONYMS
2. OVERVIEW OF SYSTEM COMPONENTS
AND OPERATION
3. CONCLUSION

1. Glossary of Terms and Acronyms

The following terms and acronyms are used throughout the detailed description:

Client-Server. A model of interaction in a distributed system in which a program at one site sends a request to a program at another site and waits for a response. The requesting program is called the "client," and the program which responds to the request is called the "server." In the context of the World Wide Web (discussed below), the client is a "Web browser" (or simply "browser") which runs on a computer of a user; the program which responds to browser requests by serving Web pages is commonly referred to as a "Web server."

Internet. A collection of interconnected (public and/or private) networks that are linked together by a set of standard protocols

(such as TCP/IP and HTTP) to form a global, distributed network. (While this term is intended to refer to what is now commonly known as the Internet, it is also intended to encompass variations which may be made in the future, including changes and additions to existing standard protocols.)

World Wide Web ("Web"). Used herein to refer generally to both (i) a distributed collection of interlinked, user-viewable hypertext documents (commonly referred to as Web documents or Web pages) that are accessible via the Internet, and (ii) the client and server software components which provide user access to such documents using standardized Internet protocols. Currently, the primary standard protocol for allowing applications to locate and acquire Web documents is HTTP, and the Web pages are encoded using HTML. However, the terms "Web" and "World Wide Web" are intended to encompass future markup languages and transport protocols which may be used in place of (or in addition to) HTML and HTTP.

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Web Site. A computer system that serves informational content over a network using the standard protocols of the World Wide Web. Typically, a Web site corresponds to a particular Internet domain name, such as "amazon.com," and includes the content

associated with a particular organization. As used herein, the term is generally intended to encompass both (i) the hardware/software server components that serve the informational content over the network, and (ii) the "back end" hardware/software components, including any non-standard or specialized components, that interact with the server components to perform services for Web site users.

HTML (HyperText Markup Language). A standard coding convention and set of codes for attaching presentation and linking attributes to informational content within documents. (HTML 2.0 is currently the primary standard used for generating Web documents.) During a document authoring stage, the HTML codes (referred to as "tags") are embedded within the informational content of the document. When the Web document (or HTML document) is subsequently transferred from a Web server to a browser, the codes are interpreted by the browser and used to parse and display the document. Additionally in specifying how the Web browser is to display the document, HTML tags can be used to create links to other Web documents (commonly referred to as "hyperlinks"). For more information on HTML, see Ian S.Graham, The HTML Source Book, John Wiley and Sons, Inc., 1995 (ISBN 0471-11894-4).

HTTP (HyperText Transport Protocol). The standard World Wide Web client-server protocol used for the exchange of information (such as HTML documents, and client requests for such documents) between a browser and a Web server. HTTP includes a number of different types of messages which can be sent from the client to the server to request different types of server actions. For example, a "GET" message, which has the format GET , causes the server to return the document or file located at the specified URL.

URL (Uniform Resource Locator). A unique address which fully specifies the location of a file or other resource on the Internet. The general format of a URL is protocol://machine address:port/path/filename. The port specification is optional, and if none is entered by the user, the browser defaults to the standard port for whatever service is specified as the protocol. For example, if HTTP is specified as the protocol, the browser will use the HTTP default port of 80.

2. Overview of System Components and Operation

Figures 1-8 illustrate the general architecture of the system that operates in accordance with the present invention. The system relates to a surveillance system via a public telecommunication network which is the Internet more

particularly one that allows the user flexibility to monitor a predetermined area through a computer linked at any point to the Internet. The system includes at least one home computer with each computer equipped with an application executable device
5 such as a modem, said modem connected to the internet.

The present invention allow a user who has access to a computer that is linked to the Internet to get the dynamically assigned IP address of the computer the user would like to view.

10 According to the flow diagram the typical manner to access the IP address according to the preferred embodiment is as follows;
The user or client intending to view the surveillance device installed in for example the user's house that is linked to the surveillance computer in the said house would firstly access a
15 particular predetermined website which will be the official website for this particular system. Once in the website the user would have to key in a valid username and password. This is if the user has already registered before, if not the user will have to register online first. The essential information that is
20 required during registration would be as follows:

- a) Name
- b) Preferred User Name & Password :
- c) Address
- d) Contact number

e) Dial-out number :

f) Country

g) product to purchase .

The above are only preferred information needed. Some
5 information maybe deleted or more maybe added which will depend
on the server operator.

The above information is mainly used as identifying code for
identifying the client when the client accesses the web page in
10 order to prevent anyone from viewing the surveillance device. It
is to be reiterated here that the above are preferred and not
essential information.

However, the dial- out number is required to allow the modem
15 bank server to autowake the desired surveillance computer and
connecting it to the thus allowing the client to view through
the surveillance device connected to the said surveillance
computer.

20 Once the correct username & password are given, then the
required "dial-up phone number" is essential to enable the
dialer server (modem bank) to initiate a call to the
surveillance computer where preferably a surveillance device
such as camera is connected to view the predetermined

surroundings. The above preferred information are store in the "server" database and it is to be noted that it will only allow authorized user with the correct username and password to be able to access into the database and the system will initiate a
5 signal dialing to the given "dial-up phone number" by the modem bank so that when the surveillance computer receives the ringing signal from the modem it will automatically wake up. It will then connect to the internet, and also send a signal back to the server together with its location and the assigned Dynamic IP
10 address given by the ISP. Hence, the server is able to host the surveillance computer name and its temporary assigned IP address for that duration of login.

The home computer will receive dialing signal from the modem
15 bank when each time the user login into server, after verification of user name with correct password, then the server will assign (authenticate) the user to the host dynamic IP address where the system will match the surveillance computer to the authorized user in the database server, (provided the
20 surveillance computer is already connected to the Internet). But if the surveillance computer is still not connected to the internet, then the modem bank will dial the surveillance computer modem bank to make the computer automatically connect to the internet where a software adapter will be installed in

the computer. This software adapter will hereinafter be called IP Tracker, that is capable of the following:

- a) Track (receiving) the signal send from the server thru ringing tone via the PSTN line
- 5 b) Automatically, connect the computer to the local ISP (Internet service provider) that is preset by the users. Eg.i) ISP dialup number, ii) user login name iii) password
- c) The tracker will auto dial the computer modem with the preset ISP dialup number (eg. 1515 - TMNET, 1511 - Jaring)
- 10 d) The tracker will then login into the local ISP with the preset login id and password
- e) The tracker will also automatically detect the login IP address provided by the local ISP
- f) The tracker will send the IP address information of the
- 15 surveillance computer back to the server to identify that surveillance computer IP address and User ID to enable the user to locate the the surveillance computer in the Internet.

20 Once, the connection is established between the user and surveillance computer, whereby the communication flow will enable the user to view images captured from the surveillance device connected to the said surveillance computer on the clients computer screen.

The server reads the current IP address of the computer at home. The said IP address which was assigned by the ISP will be sent to the server for hosting by the installed software in the home
5 computer. Once the computer is connect to the internet and while the software is still active, the software will send the dynamic IP address and the computer identity (username) to the server for hosting whereby the user from other place to login into the website, then they able to make connection possible to
10 their home with the correct matching by the system.

Once the IP address is identified then it is sent to the server which in turn sends it to the users computer. And the system will make authentication redirect the user computer to the home
15 computer as the IP address is make known to the user computer to establish the connection.

3. Conclusion

While the invention has been described herein with reference to
20 certain preferred embodiments, these embodiments have been presented by way of example only, and not to limit the scope of the invention.

Accordingly, the scope of the invention should be defined only in accordance with the claims that follow. In the following

claims, reference characters used to designate claim steps are provided for convenience of description only, and are not intended to imply any particular order for performing the steps.

Claims

- 1) A surveillance system deployed over a public telecommunications network, comprising:
- at least one surveillance device;
- 5 a surveillance computer provided with
- an interface for linking to said at least one surveillance device; and
 - an interface enabling said computer to access a public telecommunications network;
- 10 an application executable on said computer which, upon successful logon to the Internet, is able to gather the dynamically assigned IP address and transmit said IP address together with a code identifying any one of said surveillance computer and surveillance device to a host;
- 15 a remote server connected to the Internet configured to host said IP address and identifying code;
- at least one user remote-monitoring computer provided with means to access said remote server via said public telecommunication network;
- 20 wherein said remote server provides said IP address to said remote-monitoring computer upon matching said identifying code, thus facilitating direct access to said surveillance computer by said remote-monitoring computer.

2) A surveillance system according to claim 1, wherein the public telecommunications network is the Internet and the surveillance and user remote-monitoring computers accesses the Internet by dial-up means.

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3) A surveillance system according to claim 1 and 2, wherein said user remote-monitoring computer's access to the remote server is permitted only after security authentication.

10 4) A surveillance system according to claim 1, wherein the remote server hosts the IP addresses and identifying codes received from a plurality of surveillance computers and allows at least a correctly-matched user remote-monitoring computer to access matched surveillance computer by IP address switching
15 means.

5) A surveillance system according to claim 1, wherein the identifying code hosted by the remote server includes a public switched telephone network (PSTN) line number connected to said
20 surveillance computer.

6) A surveillance system according to claim 1, wherein the surveillance computer is in wake-up ready mode, including sleep, suspend, hibernate and like modes whereby a user remote-

monitoring computer may access the remote server and upon being correctly matched to the surveillance computer, initiate from the server an incoming signal via the PSTN line to remotely wake-up said surveillance computer.

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7) A surveillance system according to claim 1, wherein the surveillance computer is in wake-up ready mode, including sleep, suspend, hibernate and like modes whereby a signal from at least one surveillance device connected thereto may trigger its wake-up.

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8) A surveillance system according to claim 6, wherein the awoken surveillance computer automatically connects to the Internet and sends its assigned IP address to be hosted by the remote server, thereby enabling the remote server to facilitate direct connection between said surveillance computer and a user remote-monitoring computer connecting to said remote server.

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9) A method of facilitating direct connection between at least two computers in a surveillance system deployed over the Internet wherein one of the computers is connected to a surveillance device and provided with dial-up access to the Internet, the method comprising the steps of:
sending the dynamically assigned IP address to a remote host;

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accessing said remote host by at least another computer by a user desiring to monitor said surveillance computer;

acquiring the IP address of said surveillance computer from said host; and

5 accessing said surveillance computer using said IP address.

10) A method according to claim 9, wherein a plurality of users simultaneously access said surveillance computer using the same steps.