

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
15 November 2001 (15.11.2001)

PCT

(10) International Publication Number
WO 01/86906 A2

(51) International Patent Classification⁷: H04L 29/06,
12/46

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(21) International Application Number: PCT/CA01/00675

(22) International Filing Date: 14 May 2001 (14.05.2001)

(25) Filing Language: English

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(26) Publication Language: English

(30) Priority Data:
2,308,261 12 May 2000 (12.05.2000) CA

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

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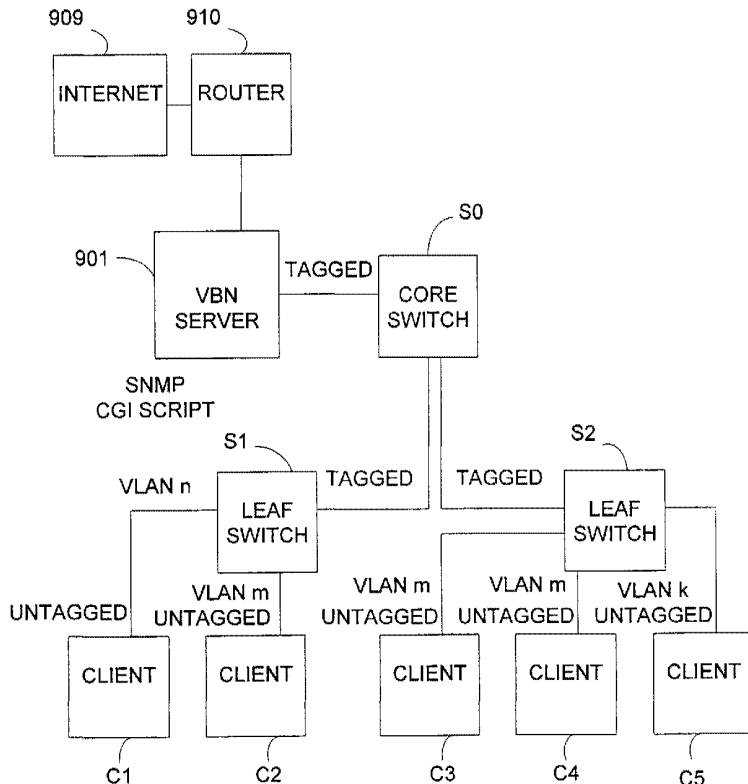
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(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian

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[Continued on next page]

(54) Title: SERVER AND METHOD FOR PROVIDING SPECIFIC NETWORK SERVICES



(57) Abstract: A server and method is provided to provide a specific service to network users. The server and method automatically provide user-to-server security using VLANs. The server manages VLAN based on the request from a user for creating/deleting/joining/leaving VLANs. The server allows user to control groupings and overcomes the VLAN limit with the filtering policies on the switching infrastructure. In the second aspect of invention, the server and method provide a specific address based on requests from users. The server dynamically handles the management and facilitation of the requests. The server offers users reassignment of IP addresses from a first set of characteristics to a second set of characteristics with minimal user intervention. This allows users the ability to run a broader range of protocols. In the third aspect of invention, the server and method is provided to provide a routable IP address to a remote computer. The server allows pools of routable addresses to be maintained on one or more remote servers. The server can solve the shortage of the routable IP addresses.

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patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

Published:

- *without international search report and to be republished upon receipt of that report*

Server and Method For Providing Specific Network Services

Field of the Invention

This invention relates to an Internet access server such as described in U.S. Application Serial No. 09/742,006, filed December 22,2000, the contents of which are
5 incorporated herein by reference. The preferred embodiment of the Internet access server described in U.S. Application Serial No. 09/742,006, will be referred herein as the SolutionIP server.

Background of the Invention

10 Local Area Networks(LANs) are data communication networks that span a physically limited area. LANs allow users to have shared access to many common resources, such as files, printers, or other communication devices. The concept of shared access to resources is central to the LAN philosophy.

15 Security, on the other hand, in traditional LANs is a major problem. For instance, in broadcast networks, everyone can see every packet on the network. Therefore, without the use of Virtual Local Area Networks (VLANs), it is possible for users on the system to see network traffic from or destined for other users. This presents a security
20 problem for the system and its users.

A VLAN is a logical subgroup within a Local Area Network that offers an effective solution to the LANs problems. The major features of VLANs are flexible network segmentation and enhanced network security.

25 However, when VLANs are used for security and group collaboration, generally they have to be manually configured ahead of time, on switching hardware. Furthermore, there is a finite number of VLANs that the switching hierarchy can support and this physical limitation on the number of VLANs supported may be an issue.

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In addition, some network protocols require fully routable Internet Protocol(IP) addresses to function (e.g. tunnelling protocols including Virtual Private Networks (VPNs)). Typically a user requesting a dynamic IP address can be given either a routable or non-routable IP address depending upon the configuration of the Dynamic Host Configuration Protocol (DHCP) server on that network.

Since in a traditional network, dynamic switching from non-routable to routable IP address is not handled by the server, users are left to their own devices if they require a routable IP address, but were served a non-routable IP address.

Summary of the Invention

It is an object of the present invention to overcome one or more of the problems cited above. A first aspect of the present invention is directed to a server and method for interpreting and processing VLAN tags coupled with server communication with the switching infrastructure for VLAN management.

A method according to the present invention for automatically providing enhanced and secure access to a group of users initiated by a non-technically trained user on a computer network without the intervention of information systems personnel includes the steps of receiving a request from the a user to establish the group of users; configuring a network infrastructure to support the group; providing a group identifier; allowing users to join the group according to the group identifier; further configuring the network infrastructure to support the joining users; and dissolving the group based on predetermined rules.

A server according to the present invention provides enhanced and secure access to a group of users initiated by a non-technically trained user on a computer network without the intervention of information systems personnel and includes a registration module to receive a request including a group identifier from the user; a registration driver to register the user to access the group of users, assign the group of users and maintain registration information and state information of a network infrastructure

associated with the group of users; a module to assign VLAN tags based on registration status; and a packet driver module to insert/remove VLAN tags from packets based on registration status.

5 According to the aforementioned invention, user-to-server security is automatically provided using VLANs whose management is automated by the server. The server facilitates user initiated group collaboration by placing users requesting the service in the same VLAN. Additionally, VLAN limits can be overcome through creative use of the filtering policies on the switching infrastructure.

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User-to-server security can be further provided by placing each individual user into a separate VLAN. The server's automation and management of VLAN creation/deletion facilitates this process, which allows a user to control groupings of users into common VLANs (i.e. group collaboration). Further, the filtering policies implemented on the switches allow users to utilize a broad range of VLANs.

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Another aspect of the present invention is directed to a server and method for dynamically providing an address according to users' requests.

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A method according to the present invention for dynamically managing pools of IP addresses on a computer network with different characteristics and moving a user from pool to pool as required includes the steps of maintaining a registry of user records and associated sets of characteristics; further maintaining a registry of IP address pools with associated sets of characteristics; receiving a request from a user to switch from a first set of characteristics to a second set of characteristics; modifying the user record in the registry so that the set of characteristics associated with the user matches the second set of characteristics; and assigning an IP address to the user from the IP address pool associated with the second set of characteristics.

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A server according to the present invention dynamically manages pools of IP addresses on a computer network with different characteristics and moves a user from pool to

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