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A method to determine user location distribution pattern in a Wi-Fi network through SNMP protocol

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In today's connected world, the biggest challenge that a network manager encounters is the allocation of the bandwidth within the network in response to the user requests to increase it in different areas of the network. However, due to the limited bandwidth provided by the service provider, in most of the situations, the network manager would not be in a position to increase the bandwidth as much as the users' request. This is because to increase the bandwidth in a particular area, it requires to decrease the bandwidth in some other area in the network in order to maintain a maximum utilization of the provided bandwidth in the entire network. On the other hand, in every network there is a pattern of user location distribution. As a result, some areas in the network require more bandwidth during a certain period of time due to the more users located in that area during that period of time whilst the other areas may not need that much of bandwidth due to the lesser number of users located. Therefore, if the pattern of user location distribution of a network can be determined, the network manager can dynamically allocate a different amount of bandwidth to the different areas of the network accordingly. In this research, we propose a novel method to determine the user location distribution data in a Wi-Fi network using Simple Network Management Protocol (SNMP protocol) and thereby to identify any pattern of user location distribution against the time. In our method is, first we get the information such as MAC addresses, IP Addresses using SNMP protocol from the routers in the network. From that information, we then get the location distribution of the users based on the router's location. We use that information to do pattern analysis and the location distribution pattern against the time is then determined. Our aim is to provide a more rational approach for network managers to allocate different amounts of bandwidth to different areas in their network while maintaining a maximum utilization of the provided bandwidth in the entire network.

Keywords: Bandwidth allocation, computer network, network management, SNMP protocol, user location distribution, Wi-Fi