

gateway is selected in step 106, the currently serving satellite adds its own ID to the connection request and forwards or routes in step 108 the revised connection request to the home gateway. If the currently serving satellite is directly coupled to the home gateway, the satellite routes the information down to the home gateway. Otherwise, the connection request has to be routed through the network of satellites. As described above, the satellites are interconnected to each other by cross-links. A table or other data structure resides in each satellite so that the connection request can be routed from the currently serving satellite through other intermediary satellites if needed, and finally to the satellite that is directly servicing the home gateway.

According to FIG. 3, after the home gateway receives the connection request in step 108, the home gateway selects in step 110 a serving gateway from a list of gateways that are capable of servicing the connection request. The gateway selected to be the serving gateway may be the home gateway or may be another gateway. If the gateway selected to be the serving gateway is not the home gateway, it is referred to as a visited gateway. In the preferred embodiment, the selection made by the home gateway is based on a few factors: where the subscriber unit is located (as contained in the connection request), whether the serving gateway is capable of handling the connection request, and whether the call is to be intercepted. There may be other factors known to those of ordinary skill in the art that may be incorporated into selecting the serving gateway.

Each gateway monitors its congestion level to determine whether it is capable of handling the connection request. The gateway status information, which includes the congestion level, is transmitted periodically or upon transitions to the satellites and other gateways in the system. Some gateways may be down or overloaded. Each gateway monitors its congestion level by determining if it wants more or less connection requests. If a gateway exceeds its maximum congestion level, it signals to the satellites and the other gateways that it will be unable to service any more connection requests. Each satellite and gateway receiving this message updates its gateway status information to indicate that the gateway is a poor choice. Conversely, when gateway determines that it can handle more calls, the gateway signals to the satellites and other gateways that it can handle more connection requests. Upon receipt of this message, each satellite and gateway updates its gateway status information to make the gateway more of a preferred choice.

Each home gateway also stores information about whether a particular subscriber unit's call is to be intercepted, and which gateway is to perform the intercept function. If the subscriber unit is to be intercepted, the home gateway assigns a serving gateway that is capable of intercepting the call. In some systems, a subscriber unit may only be intercepted at the home gateway. In such a case, it is important that the home gateway selects itself to service the call. In other systems, a subscriber unit's call may be intercepted at any gateway. In such a situation, any of the visited gateways can be selected to intercept the call.

Once the home gateway selects a visited gateway in step 110 in FIG. 3, the home gateway forwards or routes in step 112 the gateway assignment to the visited gateway. In an alternative embodiment, the home gateway before step 112 may first determine if it selected itself to be the serving gateway. If the home gateway selected itself, method 100 skips steps 112 and 114 and sets up the call between the subscriber unit and satellite (as performed in step 116 and further discussed below). Once the visited gateway receives the gateway assignment in step 112, the visited gateway

decides in step 114 whether to accept or reject the connection request. If the visited gateway decides not to accept the call for a reason associated with this gateway (i.e., a reason that would not preclude another gateway from servicing the call), the visited gateway selects in step 118 an alternate visited gateway from an ordered list of preferred alternate visited gateways. This list includes all other possible gateways that can service the call. Once the alternate visited gateway is selected in step 118, the connection request is forwarded to the alternate visited gateway in step 120.

The alternate visited gateway decides in step 122 if it wants to accept or reject the connection request. If the alternate visited gateway accepts the connection request, the alternate visited gateway sets up the call in step 116. Otherwise, the alternative request is rejected and the call is dropped in step 124. Step 124 may include the step of sending a reject message to the subscriber unit that indicates that the connection request is being rejected. In an alternative embodiment, method 100 determines whether the connection request has been forwarded a predetermined number of times. If the connection request was forwarded less than the predetermined number of times, method 100 repeats steps 118, 120 and 122 until it either sets up the call in step 116 or exceeds the predetermined number of times of forwarding the call and eventually rejects the call in step 124.

Call setup as performed in step 116 requires that the visited gateway signal the currently serving satellite with synchronization information so that the subscriber unit and the currently serving satellite can communicate with each other. Call setup procedures are well known to those of ordinary skill in the art. Once the call is setup in step 116 or rejected in step 124, method 100 ends.

It will be appreciated by those skilled in the art that the present invention includes a method where a home gateway selects a serving gateway based on the location of the subscriber unit, whether the call is to be intercepted and whether the serving gateway is capable of servicing the connection request. Thus, it is an advantage of the present invention to assign a specific subscriber unit to a serving gateway for the purpose of intercepting the subscriber traffic. Another advantage of the present invention is that a call is not dropped because the visited gateway initially assigned by the home gateway is unable to service the connection request. Yet another advantage of the present invention is that connection requests are routed around disabled or congested gateways. An additional advantage of the present invention is that connection requests that would have been dropped due to gateway congestion or failure are now served by an alternate gateway. Another advantage is that a subscriber unit can be served by any one of a number of alternate gateways.

Accordingly, it is intended by the appended claims to cover all modifications of the invention which fall within the true spirit and scope of the invention.

What is claimed is:

1. A method for assigning a subscriber unit to a visited gateway, the method comprising the steps of:

- a) receiving a connection request;
- b) forwarding the connection request to a home gateway and selecting an alternate home gateway if the home gateway is incapable of servicing the connection request;
- c) selecting the visited gateway from a list of gateways to service the connection request;
- d) forwarding the connection request to the visited gateway; and