These estimated probabilities are applied to network resource allocator **122**, along with the output of demand history database **112** (which may include such information as service priority, grade of service, delay, and the like), decision history database **120**, resource pool **118**, and cost function database **116**.

Network resource allocator **122** then processes this information and applies signals to devices **102**, **104** and **106** indicative of the network resource allocation decisions. Network resource allocator **122** also applies the allocation decisions to decision history database **120**. This historical information may be helpful in ensuring that all devices are given a fair amount of resources in view of the priorities associated with each device.

By using the probabilities of the active and inactive time periods of the traffic patterns for each of respective devices **102**, **104** and **106**, a "look ahead" scheme may be employed to predict the likelihood of each user's activity and use this information to make network resource allocation decisions.

By way of further illustration, if a particular user is a low-priority user, and makes a request to a network for higher-priority service, the use of the techniques described herein permit the network resource manager to predict whether the amount of time a particular user will likely consume high-priority network resources is greater than or less than the time period during which those high-priority network resources are likely to be available. Accordingly, highly efficient utilization of network resources and bandwidth results.

In accordance with one embodiment of the invention, to preserve or enhance a quality of service provided to high-priority users, the method described above may include a preemptive process, which is used in connection with the DAMA communication system described herein. The preemption process is suitably configured to allow a low-priority user service to be preempted by a high-priority user if the high-priority user requests service, and no resources are available.

Although the present invention has been described with reference to the drawing figure, those skilled in the art will appreciate that the scope of the invention is not limited to the specific forms shown in the figure. Various modifications, substitutions, and enhancements may be made to the descriptions set forth herein, without departing from the spirit and scope of the invention which is set forth in the appended claims.

What is claimed is:

1. In a communications network having a plurality of devices competing for network resources, a method for allocating the network resources comprising the steps of:

receiving at a network resource manager, from each of said plurality of devices, a request for network access, a first set of distribution parameters for the distribution of time when the device is active and a second set of distribution parameters for the distribution of the periods of time the device is inactive;

predicting whether sufficient network resources exist to accommodate said request based on the first set of distribution parameters and the second set of distribution parameters for each of said plurality of devices; and

allocating the network resources in accordance with said prediction.

2. The method of claim **1**, further comprising transmitting, from said network resource manager to said plurality of devices, information indicative of the allocation of the network resources.

3. The method of claim **1**, wherein said step of allocating network resources comprises allocating network resources in a cellular telephone network and further wherein said plurality of devices comprise a corresponding plurality of cellular telephones.

4. The method of claim **1**, further comprising providing a preemption process to allow a high-priority device to preempt service from a low-priority device.

5. A network resource manager for allocating network resources comprising:

a demand prediction processor operable to store for each of a plurality of devices coupled to the network resource manager a first set of distribution parameters associated with the distribution of the period of time when the device is active and a second set of distribution parameters associated with the distribution of the periods of time when the device is inactive, the demand prediction processor further operable to calculate, upon receiving a request for network access, an estimated probability of whether each of the plurality of devices will be active or inactive; and

a network allocator coupled to the demand processor, the network allocator operable to receive the estimated probability and to generate network resource allocation decisions based on the estimated probability.

6. The network resource manager of claim **5**, wherein the network resource allocation decisions are sent to each of the plurality of devices.

7. The network resource manager of claim **5** wherein the network resource allocation decisions are stored in a decision history database coupled to the network allocator.

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