Decreasing Call Blocking Rate and Dropping rate by Implementing Resource Planning Model Through Auxiliary Station in Search Mode

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Abstract—**Cellular network faces the problem of call blocking due to the non availability of free channels in the base station. This problem is reduced to some extent by using auxiliary stations, but there is still a problem of call blocking. This call blocking problem can further be reduced by implementing Resource Planning Model with the Auxiliary station which in future will reduce call dropping probability and provide optimal utilization of radio frequencies.**

Keywords-Cellular network, Base station, Resource Planning model.

I. INTRODUCTION

A cell in the cellular network is served by the station known as base station. Each cell used different set of frequencies with its neighboring cells to avoid channel interference. Two cells cannot use the same channel at the same time if the distance between them is less than the minimum channel reuse distance (Dmin) [1]. Frequency Reuse is used because we have limited frequency spectrum, which can be used for communication purpose. So frequency channels have to be reused to cover the large geographical area [2].Each call made by mobile host firstly get connected to the base station and base station provides a channel for continuing the call. If base station has no free channels than all originating calls from that cell as well as the handoff calls get blocked. Handoff calls are the call which originates from foreign cell and due to the movement of the mobile host, it crosses the coverage range of its home cell. In [3] the call blocking rate is reduced by using auxiliary stations, when all the channels of the base station is busy, the incoming and handoff calls are handled by the auxiliary stations till the availability of the free channels at the base station. But when all the channels of the base station and auxiliary stations both are busy then again call blocking will increases.

This can be more improved by implementing the Resource planning model with auxiliary stations. When all the channels of auxiliary stations are busy then Resource Planning model sends a request for free channels availability to their neighboring cells. All neighbor cells send their free channels to the base station and active calls from the auxiliary station connected to the free channels.

RESOURCE PLANNING MODEL

Planning of resources before using them is resource planning. In cellular system the method of knowing the status of the channels before assigning them task is known as resource planning model [4]. Each cell has their primary channels and secondary channels. The channel of its own cell is known as the primary channel and borrowing channels from neighbor cells is known as secondary channels. When any mobile host request for channel and own cell channel (Primary channel) is available, then that mobile host is connected to that free channel and if channel is not available with in the cell then, auxiliary station request for free channels availability from its neighbor cell.

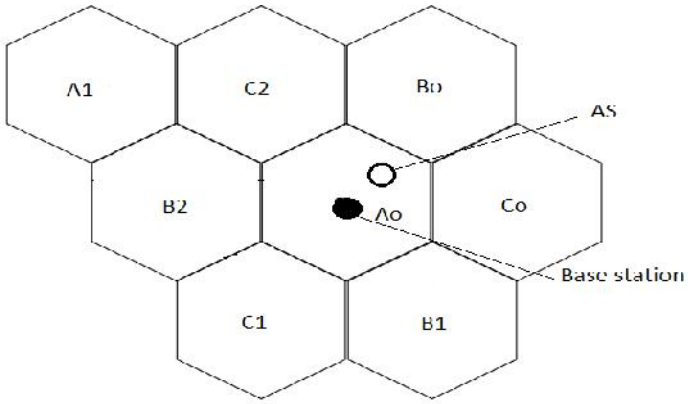
II. RELATED WORK

In [2] an auxiliary station is placed in the cell. When all the channels of the base stations are busy then incoming call s get connected with the auxiliary station for some fixed time and in between this auxiliary station checks the base station for the free channel availability, if free channel is available then the call disconnected from the auxiliary station and get connected with the base station. In this way call blocking and dropping rate get reduced

to some extend but again the same problem arises when all the channels of base station and auxiliary station are busy. So this can be improved by using the resource planning model with the auxiliary stations.
Resource Planning Model sends request for free channel availability to its neighbor cells. And all neighbor cells send their free channel to auxiliary station. Among the channels a common channel is selected which is free in all the cells to avoid interference and on going call at the auxiliary station get connected to that free channel. In this way channels at the auxiliary station becomes free and can handle more calls and our call blocking and dropping rate get reduced to much more extend.

III. PROPPSED SCHEME

A.Resource planning model is used with the auxiliary stations to borrow the free channel from their neighbouring cells.In the figure below suppose cells Ao,Bo,Co are allocated with the following set of channels.



Channel borrowing using Resource Planning Model

Ao= 1-10
Bo= 11-20
Co= 21-30

When cell Ao sends a request for free channel allocation to its neighbor cell, all neighbor cells send their free channels to Ao. Suppose received channels by Ao are as

Bo= 11, 12, 13	Co= 21, 24, 27
B1= 12, 14	C1= 23, 24, 28
B2= 12, 15	C2= 21, 24, 29

So in cells Bo, B1, B2 channel no.12 is common and in cells Co, C1, C2 channel no. 24 is common. These two channel are assigned to the calls which are handled by the auxiliary Station, and now two channels are free at the auxiliary station to handled the incoming calls. This reduces the call blocking probability.

1. Mobile station request for channel to the base station.
2. if (channel!=0)
3. Connect to the base station
   Else
   Connect to the Auxiliary Station
4. AS check for free channel at base station at fixed time interval
   If (channel!=0)
   Disconnect call from AS and connect to base station
   Else
   AS sends request for free channel availability to its neighbor cells
   AS gets all free neighbor channels
5. Select common channel among all and disconnect ongoing call from AS and connect it to that free channel
6. New incoming calls handled by AS
7. End.

IV. RESULT

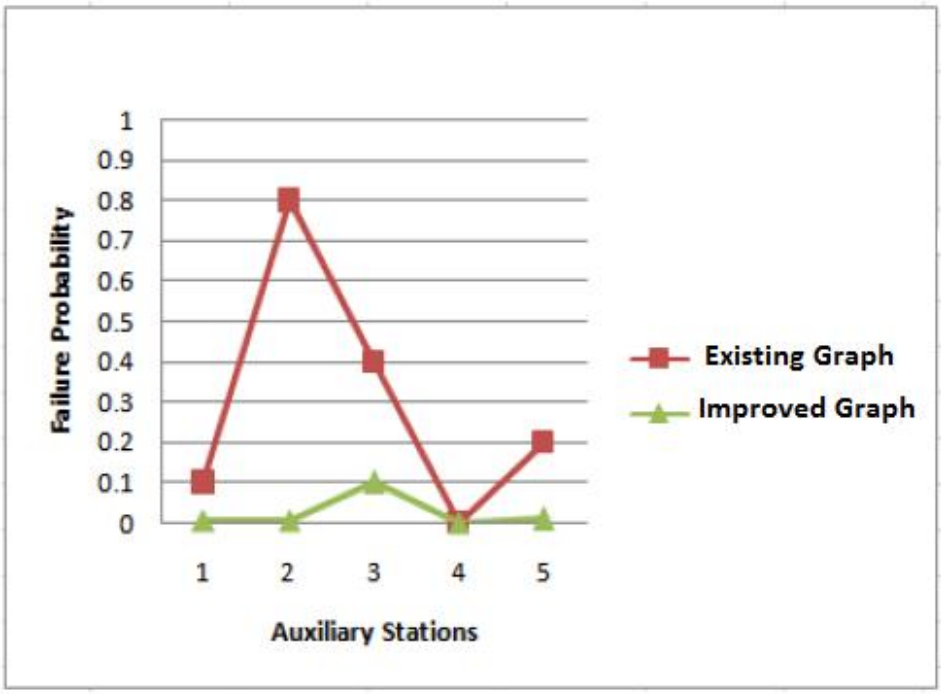


Fig 3 Failure Probability of Existing Graph and Improved Graph

The above graph shows the reducing rate of call blocking and dropping. Red line graph shows the existing blocking rate and green line shows the new improved rate of call blocking, which shows as the number of auxiliary station increases the blocking rate is decreasing continuously.

V. CONCLUSION

The above proposed scheme will decrease the call blocking and call dropping rate. In this way base station can handle more number of Mobile Hosts and our quality of providing services get increased. This scheme will make optimal utilization of our radio frequencies, which are in a limited amount that can be used for communication purpose. When base station is busy call get connected at the auxiliary station and through resource planning model free channels of neighboring cells can be used to connect the calls handled by auxiliary station and in this way the quality of service get increased. The purpose of this improved version of auxiliary station is to provide better utilization of bandwidth.

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