ENTS 656 PROJECT REPORT

-Submitted by Lalitha Sahitya Maruvada

UID:114885432

Q1) what is the ratio of the number of dropped calls to the number of completed calls? What is the main reason for call failure? Are blocks for channel capacity?

The dropped calls count is twice the completed calls. The reason for call failure is allowing a lot of users to attempt the call, which might even get dropped due to low RSL, this in turn is also reducing the call quality of the ongoing calls(decreasing the SINR), thereby increasing the dropped calls. Hence the total failed calls(blocked+dropped) are increasing.

Simulation Results:

Ratio of dropped calls to completed calls 2.074391498114501
number of call attempts not counting retries:11556
total number of attempts including retries is 19747
number of users retrying 2
number of dropped calls: 5935
number of blocked calls due to signal strength :2730
number of blocked calls due to channel capacity: 0
number of successfully completed calls:2862
number of calls in progress in any given time: 27
number of failed calls: 8665
current cell radius is: 9.592021407606971
****

Q2: Change the values of C d and C i to 20 and 15 respectively. What happens to your statistics? What is the ratio of dropped calls to completed calls now? How has the number of blocked calls changed? What is the effect on the cell radius?

The admission control is reducing the number of dropped calls, by blocking the entry of a lot of users into the cell at the edge of the cell. The ratio of dropped calls to completed calls is now 0.02. From the statistics we can clearly observe that there is a drastic increase in the blocked call count and a tremendous decrease in the dropped call count. By implementing admission control, the call quality increases by blocking users who would decrease the SINR of the ongoing calls. Since the total number of users using the cell is reduced due to call blocking, the call completed would also be reduced when compared to situation without using admission control. The cell radius has slightly reduced.

Simulation Results:
Ratio of dropped calls to completed calls 0.028549962434259956
number of call attempts not counting retries:11475
total number of attempts including retries is 41791
number of users retrying 3
number of dropped calls: 38
number of blocked calls due to signal strength :10105
number of blocked calls due to channel capacity: 0
number of successfully completed calls:1312
number of calls in progress in any given time: 17
number of failed calls: 10143
current cell radius is: 8.804524323436254
****

3)Increase the number of users to 10000 and rerun your simulation, first with no admission control (i.e. C d and C i set to 57 and 0 respectively) and then with the C d and C i values from Q2. What happens to the blocks due to channel capacity? How do they change when the C d and C i values change?

When the users count is increased to 10000, calls are blocked due to channel capacity. But the blocked calls due to channel capacity are less when admission control is implemented than without admission control

With admission control:
number of call attempts not counting retries:119213
total number of attempts including retries is 427190
number of users retrying 24
number of dropped calls: 13158
number of blocked calls due to signal strength :102656
number of blocked calls due to channel capacity: 8
number of successfully completed calls:3341
number of calls in progress in any given time: 26
number of failed calls: 115822
current cell radius is: 9.795733207306577
****

Without admission control:
number of call attempts not counting retries:116861
total number of attempts including retries is 208293
number of users retrying 14
number of dropped calls: 79864
number of blocked calls due to signal strength :30475
number of blocked calls due to channel capacity: 951
number of successfully completed calls:5513
number of calls in progress in any given time: 44
number of failed calls: 111290
current cell radius is: 9.944206622455368
****

HONOR PLEDGE: I pledge on my honor that I have not given or received any unauthorized assistance on this assignment.

Signature_____Lalitha Sahitya Maruvada_____