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A New Method That Reduce the No of Tower in A Fixed Area

Debabrata Sarddar, Pinaki Das, Rajat Pandit

Abstract: ***In mobile communication the previous work there are the no of tower are fixed and we use the frequency reuse method to use the same frequency in next neighbour cell. When we reduce the tower number the service area are reduce. Due to the unit area no of channel are fixed so if we reduce the tower no then reduce the area. But increasing of channel the no of tower are reduce in the fixed area or increased more region for service where unit area the number of channel are fixed.***

Index Terms**: Channel, Tower, frequency, Radiation Power.**

I. INTRODUCTION

The numbers of cell tower are fixed for a certain area. Because every tower has the fixed number of channel that has been radiate and the mobile node (MN) are connected through that channel. Per unit area the number of channel are fixed [1]. That channel is fixed so we cannot decrease the tower number. If we decreased the no of tower the service region are reduced or we increased the radiation power then the services channel are reduce for same area.

If we enhanced the number of channel then in the fixed area the number of channel are increased. In practical the service MN are nearly fixed in active time or idle time [2]. In another work the channel are increased [3]. So per unit area the channel are increased, if we increased the radiation power of tower then the services are increased and maintain the unit area channel no or we decreased the no of tower then the unit area channel are fixed. That means the same number of MN are use the service with the minimum number of tower.

II. RELATE WORK

In another work the channel are increased, the guard band of the channel are reduce with maintain the safety ration [3]. The increased channel is

$$N_{increased} = \frac{(n+1).W.n}{2A} \quad (1)$$

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***** Correspondence Author (s)
Dr. Debabrata Sarddar, Assistant Professor, Department of Computer Science and Engineering, University of Kalyani, Kalyani, West Bengal, India.
Mr. Pinaki Das, Department of Mobile Communication and Networking Technology from W.B.U.T (MAKAUT), West Bengal, India
Mr. Rajat Pandit, Assistant Professor, Department of Computer Science, West Bengal State University, West Bengal, India.

In that method the service are increased per unit area. That means maximum mobile node can served the work through the single tower. No such research work is done for reducing the no of tower in fixed area.

III. PROPOSED WORK

In our previous work, we reduce the cost of mobile communication using the check manager method [4]. Now we enhanced the channel of tower per area [3]. That means the service of no of MNs is increased. A tower gives the more service if we increase the radiation power of frequency then the service region is increased. If the service regions are increased then the numbers of towers are reduced.

If the tower no is 'T' and the services region is 'A' for every tower.

Total area for T no of tower $Area_{total}$

$Area_{total} = T.A$ (2)

No of channel is 'n' and 'W' is the width of guard band.

The new increaser channel no is

$$N_{increased} = \frac{(n+1)Wn}{2A} \quad (3)$$

New total number of channel

$$N_{total} = n + \frac{(n+1)Wn}{2A} \quad (4)$$

$$\text{Area per channel} = \frac{A}{n} \quad (5)$$

N_{total} channel service area X

$$X = N_{total} * \frac{A}{n} \quad (6)$$

That means x area is covered by 1 tower.

T.A area is covered by $\frac{T.A}{X}$ (7)

New total tower no is $T_{total} = \frac{T.A}{X}$

$$T_{total} = \frac{T}{1 + \frac{(n+1).W}{2A}} \quad (8)$$

Let $P = 1 + \frac{(n+1).W}{2A}$

$T_{total} = \frac{T}{P}$

New total number of towers for same coverage area is $T_{total} = \frac{T}{P}$

Old total number of towers for same coverage area is T

Then we say that

$T > T_{total}$ (9)

The equation (8) is show that the total number of tower is reduced for the fixed area.

IV. SIMULATION RESULT

If the no of channel are increased then the tower number are decreased with the ration of 'P'. The following figure is shown, if the area are fixed then the rate of change of tower.

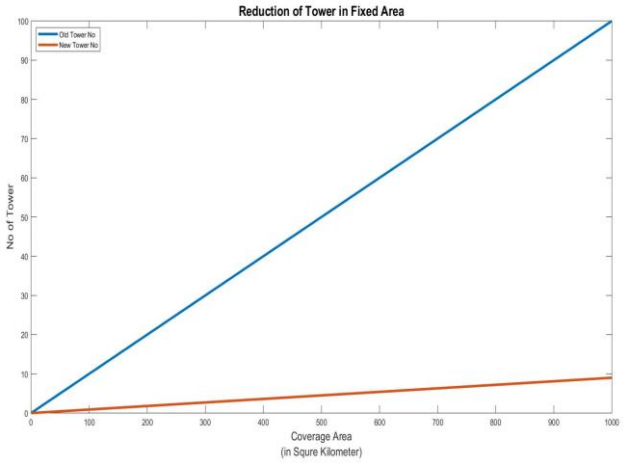

Figure 1: Fixed area Vs. No of Tower

The next figure is shows the previous tower number and new tower number.

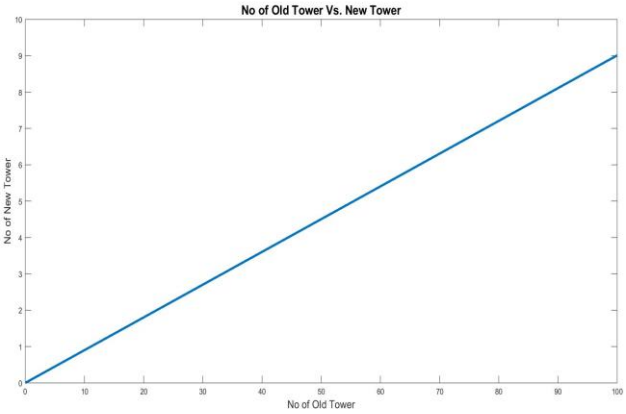

Figure 2: No of old tower Vs. No of new Tower

The next figure is shown the ration of old and new tower in a fixed area.

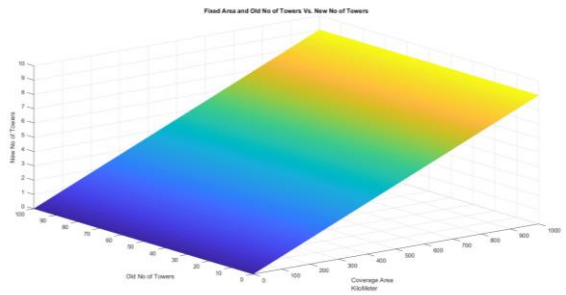

Figure 3: No of old tower Vs. new Tower in a fixed area.

V. CONCLUSION

In the conclusion we tell that the new no of tower are less that the old number of tower in a fixed geometrical region. In that case the number of channel per unit area is fixed.

VI. FUTURE WORK

In this paper we reduce the no of tower, but in that case the radiation power is increased. In future we can minimize the radiation power or make the equilibrium of radiation power and tower number.

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AUTHORS PROFILE

Dr. Debabrata Sarddar received his B.Tech degree from NIT Durgapur West Bengal, India in 2001 and M.Tech degree in DAVV Indore, Madhya Pradesh, India in 2006. He is awarded Ph.D. from Jadavpur University, India. Currently he is Assistant Professor in Department of Computer Science and Engineering, University of Kalyani, Kalyani, West Bengal, India. His published journal paper no is 200, books is 3, patent is 1 and the book chapter is 12. His research interests include mobile communication, satellite communication.

Mr. Pinaki Das is currently pursuing his Ph.D. at University of Kalyani. He completed his M.Tech in Mobile Communication and Networking Technology from W.B.U.T (MAKAUT), West Bengal, India in 2015, M.Sc at Vidyasagar University, West Bengal, India in 2010 and B.Sc. at University of Kalyani, Wes Bengal, India in 2008. His research interest includes wireless and mobile communication.

Mr. Rajat Pandit is an assistant professor in the Department of Computer Science, West Bengal State University, West Bengal, India. He has completed his M.Tech (IT) from West Bengal, University of Technology, West Bengal, India in 2009. He has completed his MCA from Jadavpur University, West Bengal, India in 2001. His research interest includes Mobile Computing, Wireless Sensor Network and Cloud Computing.

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