To Minimized the Handoff of Next Generation Mobile System by using Predictive Method.

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Abstract: In the next generation cellular system or Next-Generation Wireless Systems a main drawback is the handoff. In time of hand off some time the connected are goes to wait state or call are disconnected. We are trying to minimize the handoff in this paper. In time of handoff, the new BTS cannot give faster service or allocate a channel in proper time duration. In IP base mobile communication, another problem are face, that is the issuing the IP. So we find the handoff probability in current service area and ensuring the new BTS to ready for allocating the signal and also IP to continue the call.

Keywords: Handoff, Next-Generation Wireless Systems (NGWS), BTS, Signaling Delay, Handoff Probability.

I. INTRODUCTION

In the mobile communication system the handoff is the power to moves from any geographical area to another geographical area that means any cell or area of Base Transceiver Station (BTS) to another cell or BTS [1]. The idle structure of BTS id hexagon but in the practical it is not the hexagon, it is the polygon shape. Each cell or regions of BTS are overlapped. In that overlapped section, when the mobile Node [MN] is belonging in that region the BTS are decided to give the services.

When a MN is moved from one BTS region to another BTS region then the two types of handoff are occurred.

A. Soft Handoff

When a MN is cross the Ping-Pong point then this hard handoff occurred. In hard handoff at first break the connected using link from old BTS and then create the new link with the new BTS. So we tell this method “Break Before Make” [2].

B. Hard Handoff

In soft handoff the MN is moved to another BTS region, the MN is requesting the new BTS to issue a link for continuation the services. After connection with the new link, the MN is break the old connection or link. So this type of action is known as “Make Before Break” [2].

Fig. 1. Hard handoff

Fig. 2. Soft Handoff

II. REVIEW CRITERIA

In the previous work the handoff are manage by the various protocols like. In practically the signal level are below the threshold level, but every time the protocol cannot perform the proper work and make the handoff failure because the handoff region are overlapped region. Then a MN are comes to this region they find the new channel and want to make the handoff. In that moment the BTS does not give the proper services because the overlapped region is very narrow [3][4].

III. PROPOSED WORK

In the idle case the two cells are overlapped and that circles are considered as hexagon. The common side of the hexagon are generally shows the Ping-Pong position because the common side are nearly centre of two overlapped region.

When a MN are moved and goes to the boundary region then the MN find the new signal of new BTS. In that manner the MN wants to make handoff and we are increasing the area of the service are to reduce the failure probability in overlapped region, as shown in Fig. 3.

Fig. 3. Exploration of the handoff process
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- Tth: Handoff initialized threshold value, the MN makes handover for new BTS.
- Tmin: The minimum value of RSS to communicate between MN and BTS.
- OBS: The old BS.
- NBS: The new BS.
- r: BTS covered region.
- U: This is the point of overlapped region.
- m: Distance between U and boundary.
- α: The motion direction of MT from point ‘U’ to handoff to NBS.
- k: Distance between side of hexagon and common cord of two hexagons.
- ϱ: in t time the direction of MN.

\[ VW = K \] (assume)

When MN goes to M'N' then handoff occurred.

\[ UW = UV + VW \]

\[ m + K = \frac{2b-\sqrt{2b+10k}}{10} \]

\[ M'M'' = K \tan 15^\circ \]

\[ M'W = M'M'' + M'W \]

\[ b - \frac{2b-\sqrt{2b+10k}}{10} = \frac{2b-\sqrt{2b+10k}}{10} \]

\[ t = \left( \frac{2b-\sqrt{2b+10k}}{10} \sec \gamma \right) \frac{1}{2v} \] (4)

We know that the pdf of \( \gamma \) is given by

\[ f(\gamma) = \begin{cases} \frac{1}{2\alpha 1} & \text{where } -\alpha 1 < \gamma < \alpha 1 \\ 0, & \text{otherwise} \end{cases} \] (5)

From (4), ‘t’ is a function of \( \gamma \),

\[ i.e., t = g(\gamma), \]

\[ g(\gamma) = \frac{2b-\sqrt{2b+10k}}{10 \times 2v} \sec \gamma \]

Where \( g'(\gamma) \) is the derivative of \( g(\gamma) \) given by
\[ g'(\gamma) = \frac{2b - \sqrt{2b + 10K}}{10 \times 2V} \sec \gamma \tan \gamma \]

\[ = t \tan \gamma \]

\[ = t \sqrt{\sec^2 \gamma - 1} \]

\[ = t \sqrt{\left( \frac{10 \times 2V \times t}{2b - \sqrt{2b + 10K}} \right)^2 - 1} \]  \hspace{1cm} (8)

From above equation 7 and 8 we get, the probability distribution function of \( t \) is given by

\[ f(t) = \begin{cases} \frac{2b - \sqrt{2b + 10K}}{10 \times 2V} & \text{where } t < \sqrt{\left( \frac{2b - \sqrt{2b + 10K}}{10} \right)^2 + \left( \frac{2\sqrt{2b + 5b}}{10} \right)^2} \\ 0, \text{otherwise} \end{cases} \]  \hspace{1cm} (9)

The handoff failure is given by

\[ Pf = \begin{cases} 1; \text{where } \tau > \sqrt{\left( \frac{2b - \sqrt{2b + 10K}}{10} \right)^2 + \left( \frac{2\sqrt{2b + 5b}}{10} \right)^2} \\ P(t < \tau); \text{where, } \frac{2b - \sqrt{2b + 10K}}{10 \times 2V} < \tau < \sqrt{\left( \frac{2b - \sqrt{2b + 10K}}{10} \right)^2 + \left( \frac{2\sqrt{2b + 5b}}{10} \right)^2} \\ 0; \text{where } \tau \leq \frac{2b - \sqrt{2b + 10K}}{10 \times 2V} \end{cases} \]  \hspace{1cm} (10)

Where the handoff signalling delay \( \tau \) and \( P(\tau < t) \) is the probability that \( t < \tau \).

Using eq. 9 we have

\[ P(t < \tau) = \int_0^\tau f(t) \, dt \]

\[ = \int_{2b - \sqrt{2b + 10K}}^{2b - \sqrt{2b + 10K}} \frac{1}{\sqrt{\left(10 \times 2V \times t\right)^2 - \left(2b - \sqrt{2b + 10K}\right)^2}} \cos \left[ \frac{2b - \sqrt{2b}}{10 \times 2V} \right] \, dt \]  \hspace{1cm} (11)

Now using 10 and 11 we have

\[ Pf = \begin{cases} 1; \text{where } \tau > \sqrt{\left( \frac{2b - \sqrt{2b + 10K}}{10} \right)^2 + \left( \frac{2\sqrt{2b + 5b}}{10} \right)^2} \\ \frac{1}{\cos \left[ \frac{2b - \sqrt{2b}}{10 \times 2V} \right]; \text{where, } \frac{2b - \sqrt{2b + 10K}}{10 \times 2V} < \tau < \sqrt{\left( \frac{2b - \sqrt{2b + 10K}}{10} \right)^2 + \left( \frac{2\sqrt{2b + 5b}}{10} \right)^2} \\ 0; \text{where } \tau \leq \frac{2b - \sqrt{2b + 10K}}{10 \times 2V} \end{cases} \]  \hspace{1cm} (12)
IV. RESULT AND DISCUSSION

- RELATIONSHIP BETWEEN HANDOFF FAILURE PROBABILITY AND SPEED

![Handoff failure probability and speed](image)

Fig. 4. Handoff failure probability and speed
When the speed is increased for a MN the handoff failure probability are increased after certain speed.

- RELATIONSHIP BETWEEN HANDOFF FAILURE PROBABILITY AND HANDOFF SIGNALING DELAY

![Handoff failure probability and handoff signaling delay](image)

Fig. 5. Handoff failure probability and handoff signaling delay
When the MNs are moves from one base station to new base station, the new BTS are take some times to allocate the signal for continuation of connection.

V. CONCLUSION

In this work we discuss the various type of handoff for MN in wireless system. If we increase the channel or make the proper probability for handoff then the handoff failure rate are decreased. If the mobility power are very high then the rate of failure of handoff are increased, but in this paper we are to minimize this error rate.

REFERENCES


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