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A Study on Minimization of 3G/4G Handover Failure

Pawitar Dulari[1*], Ajay Bhushan[2]
[1]Department of Physics, Government PG College Una (H.P.), India
[2]Galgotias College of Engineering and Technology Greater Noida, India
*Corresponding author : pawitar.ibs@gmail.com

ABSTRACT

One of the better thought-provoking features of Fourth Generation networks is their assimilation with Third Generation networks. It supports seamless End to-End services. At present extensively deployed Third Generation and Fourth Generation networks provide enabling interoperability. The particular mechanisms have Inter RAT idle mode reselection. Inter RAT dedicated mode reselection is used for Packet Switching services. The WLAN coverage on one hand contribute an further coverage in the low signal strength sector. We achieved the channel scanning with in the WLAN coverage area. To decrease the handover failure by reason of scanning delay.

Keywords : Inter RAT, 3G/4G, Signal Strength, Ping-Pong effect, Call Handling, Mechanism Handover.

I. INTRODUCTION

The aim of the 3G/4G handover procedure is to carry the service provided to the User equipment, while moving elsewhere from the coverage area of one 3G/4G to another 3G/4G. The handover mechanism is ultimately achieved. Measurements done by the mobile User equipment on the neighbour cell choice of the perfect candidate cell. That finishes the handover norms & condition. To rise the signalling messages on the network. This is well-known by the Ping-Pong effect. There are two handover directions described below Fourth Generation-to-Third Generation inter-RAT Hand Over, Third Generation-to-Fourth Generation inter-RAT Hand Over and Call Handling mechanism.

1.1 3G-to-4G Handover direction:

In the Third Generation to Fourth Generation direction. Mobile Station terminals that is ready to be served in the Fourth-Generation service layer. Operators deploy Fourth Generation services in two strategies. The first planing is to boost the coverage of the deployed GSM network. To co-locate Fourth Generation sites side-by-side of the current GSM sites. Decision to handover the UE/MS from the serving GSM cell to one possible target Fourth Generation. CPICH Ec/Io reflects Fourth Generation cell signal quality at the UE/MS point. The main causes of the unpleasing Ping-Pong phenomena [9].

1.2 4G-to-3G Handover direction:

The mobile User equipment performs measurements on the Third-generation neighbour cells. The triggering circumstances are fulfilled. These triggering conditions take into study the signal quality. The systematic CPICH Ec/Io value and also the cell load confirmed by the UL interference level seen by the Node B. The best cell among the neighbor cells that fulfills the HO criteria is to be selected for HO execution [1].

II. METHODS AND MATERIAL

2.1 Conventional Handover Mechanism

In cellular network the two mobile stations and the BTS frequently compute the radio signal strength. The mobile station broadcast its amount reports regularly to the BTS. If the BTS catch a decrease in radio signal under a minimal level d urge, cf it trigger a handover appeal The BTS then informs the BSC about their quest, which then verifies if it is possible to shift the call into a new adjacent cell. Actually the BSC checks get through a free channel is an accessible in the new adjacent cell or not. In this stage the BSC does not differentiate between the channel appeal either for fresh call or handover. If a complimentary channel is available in the new adjacent cell then handover appeal can be satisfied, and the mobile station switch to different cell. If there is no complimentary channel in the adjacent cell then it increases the dropping probability of handover call. The defect of this handover procedure is the fact that the handover request for channel is same as used for fresh calls cf. In traditional handover mechanism is very problematic from the users quality of service perspective, since user can much choose block a crisp call rather than to be dropped a call in the middle of transmission.

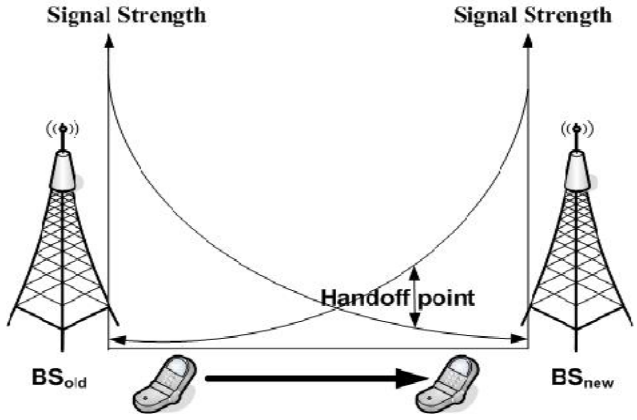

Figure 1 : Signal Levels for Handover

2.2 Channel Carrying Handover Mechanism

The channel carrying mechanism grants a mobile station to carry its con going channel from one cell to another when it moves across the boundaries under clear-cut conditions. The channel carrying mechanism adopting a linear cellular system model in which cells or BTS are organized in linear configuration with least possible reuse distance r as shown in the figure. Suppose N be the total number of channels feasible for use in cellular system. Two cells can adopt the same set of channel as they are aside by distance r.

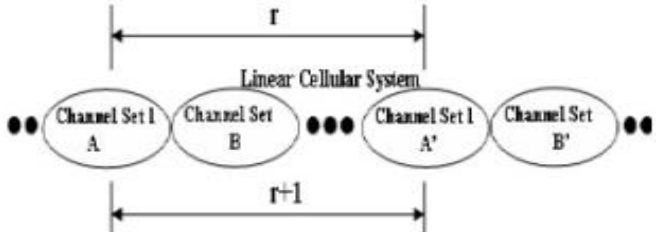

Figure 2 : r and (r+1) channel carrying

To bypass the co-channel interference an advance solution is proposed in which the distance of identical sets of channels is increased to r+1 instead of r. The distance r is known as minimum reuse distance or reuse factor. According to the figure the total number of available channels in each cell is now reduced by amount of N/(r+1) where N is the total number of accessible channels. In typical condition where the lesser the reuse distance the more amounts of channels is to be lost. The channel carrying mechanism does not desired the complex power control or global channel coordination which simplifies its application. Handover request are highly favored over new calls correlated to the Conventional handover mechanism. The main defect of this handover procedure is not applicable for metropolitan environment due to the high amount of channels lost [2].

2.3 Handover Prioritization Schemes

Different concepts and approaches are proposed to shorten the handover dropping probability. One way is to reduce the handover failure rate is to prioritize handover call over new calls. Handover prioritization schemes have a important impact on the call dropping probability and call blocking probability. Such scheme allows high utilization of bandwidth while guaranteeing the quality of service of handover calls.

Basic method of handover prioritization schemes are guard channels (GC), call admission control(CAC) and handover queuing schemes. Sometimes these schemes are combined together to achieve better results[3].

2.4 Guard Channel Prioritization Scheme

The guard channel scheme was made known in 80s for mobile cellular systems. Nonetheless the guard channel scheme are pacific used in telecommunications with the name of Cut-off Priority Schemes. GC scheme bettering the probability of fruitful handover by simply reserving a number of channels exclusively for handover in each cell. There maining channels can be shared equally between handover and new calls. GC are established only when the number of free channels is equal to or less than the predefined threshold as shown in figure. In this situations crisp calls are sidesteps and only handover request are served by the cell until all channels are occupied. The GC scheme is attainable because new calls are less sensitive to delay than the handover calls [11].

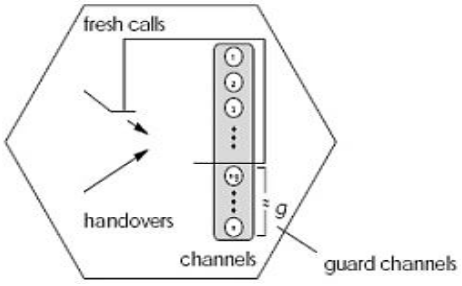

Figure 3 : State Transition Diagram of Guard Channels

If we consider a cellular network with C the entire number of channels in a given cell. According to GC scheme stokepile channels for handover are C-T where T is the predefined.

2.5 Call Admission Control Prioritization Scheme

The call admission control scheme refers to the task of deciding whether new call appeal is admitted into the network or not. In the CAC the advent of new call are estimated continuously and if they are higher than the predefined threshold level then some calls are restricted (blocked) irrespective of whether a channel is accessible or not to decrease the probability of handover calls. In the CAC both the new and handover calls have to approach to all channels. If a new call that is bring out in cell cannot find an idle channel the call is discarded immediately. There is no queue provided for the new calls to halt. The CAC scheme can be divided into different schemes that consider the local information like (the amount of unused bandwidth in cell where the user currently resides), remote information (the amount of unused information bandwidth in the neighboring cells) or local or remote information to resolve weather to accept or reject a call. CAC based on knowledge of both network and user characteristics, keeps the track of available system capacity and accommodates new call request while ensuring quality of service for all existing users. Determination in CAC are achieved in each BSC in a distributed manner and there is no central coordination [12].

III. Background Related Work

Bettering the handoff technologies of cellular as well as IEEE 802.11 based networks. Past few years' methods based on neighbour graph and geo-location on AP has been accepted. Inter-RAT handover performance 3G and 4G. Overlay area assisted call admission for communication system. using RSS measurement and speed information, 2. Time threshold calculation for minimization hand over failure.

IV.CONCLUSION

Minimization of 3G/4G handover failure is an important telecommunication feature. We provide a brief description of feature in the two directions.

1. Call handling mechanism is used.
2. Radio parameter is used.

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VI. REFERENCES

[1]. Li, J., Shorff, N and Chong, E (1996) Channel Carrying: A Novel Handoff Scheme for Mobile Cellular Networks. Online].ECE Technical Reports. http://docs.lib.purdue.edu/ecetr/98

[2]. Tripathi, N., Nortel, Jerry, R and Vanlandingham. (1998) Handoff in Cellular Systems. Internet.IEEE Personal Communication. https://www.cs.tcd.ie/~htewari/papers/tripathi98.pdf

[3]. Katzela, I and Naghshineh. (1996) Channel Assignment Scheme for Cellular Mobile Telecommunication Systems- A Comprehensive Survey, IEEE Personal Communications, 3 (3): pp.10-31.

[4]. Yliopisto, O. (2005) Smart Packet and Call Admission Control for Efficient Resource Management in Advanced Wireless Networks. PhD Dissertation. University of Oulu, Finland.

[5]. Insitute of Electrical and Electronics Engineers. IEEE Std 802.12TM-2008. Part 21: Media Independent Handover Services, 2008.

[6]. Insitute of Electrical and Electronics Engineers. IEEE Std 802.16TM-2009. Part 16: Air Interface for Broadband Wireless Access Systems, 2009. 15Internet Engineering Task Force. Website: http://www.ietf.org/.

[7]. T. Inzerilli and A. M. Vegni. A reactive vertical handover approach for WiFi-UMTS dual-mode termi- nals. In Proc. of IEEE International Symposium on Consumer Electronics (ISCE), pages 1–4, Algarve, Portogallo, April 2008.

[8]. G. Lampropoulos, N. Passas, L. Merakos, and A. Kaloxylos. Handover management architectures in integrated WLAN/cellular networks. IEEE Communications Surveys & Tutorials, 7(4):30–44, October 2005.

[9]. 2G/3G Inter-Rat Handover Performance Analysis A. Mohammed, H. Kamal2, S. AbdelWahab2 'Department of Signal Processing, Blekinge Institute of Technology, 372 25 Ronneby, Sweden. (2007)

[10]. Akyildiz, I., Xie, J. and Mohanty, S.: "A Survey of Mobility Management in Next-Generation All-IP-Based Wireless Systems", IEEE Wireless Communications, vol.11, pp. 16-28, (2004).

[11]. Gustaffson, E. and Jonsson, A.:" Always Best Connected", IEEE Wireless Communications, vol. 10, pp. 49-55, (2003).

[12]. D. Sarddar et all, "Minimization of Handoff Latency by Angular Displacement Method Using GPS Based Map ", IJCSI International Journal of Computer Science Issues, Vol.7, Issue 3, No 7, May 2010.

[13]. Earl J. Lum "The Evolution of the BTS Market: Towards 4G Technology" CS MANTECH Conference, May 17th-20th, 2010, Portland, Oregon, USA .

[14]. Abdulova, V., and Aybay, I. (2006) Handoff Prioritizing Schemes in Cellular Wireless Networks. IEEE Computer Networks Symposiums.16 (18), pp 1-6.

[15]. 1CH. M.H. Saibaba 2Prof. Ravindra Babu Kallam 2Dr. M. ThirupathiReddy (2010) Eradication of Magnetic Radiations Produced By Mobiles Devices http://www.ijcaonline.org/journal/number7/pxc387278.pdf

[16]. http://en.wikipedia.org/wiki/Wireless_LAN_Wikipedia,fre Encyclopedia. (2002)

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