International Journal of Engineering Research-Online
A Peer Reviewed International Journal
Articles available online http://www.ijoer.in

Vol.3., Issue.4., 2015 (July-Aug)

REVIEW ARTICLE

ISSN: 2321-7758

A NOVEL METHOD FOR HANDOVER TRIGGERING CONDITION ESTIMATION

VINAYAK JOSHI.B[1], Dr.MANJAIAH.D.H[2]

[1]Dept of CS&E, AITM, Belgaum

[2]Dept of Computer Science, Mangalore University, Mangalagangothri, Mangalore, India

ABSTRACT

It is desirable to maximize the WLAN usage in integrated heterogeneous network environment due to its high speed access and low access cost. We have modeled under geometry and mobility effects to dynamically estimate the distance of a mobile terminal from the access point at which the handover must be triggered to keep probability of handover failure within desired bounds while maximizing the WLAN usage. MonteCarlo simulations are provided and they are in good conformance with our analytical findings

INTRODUCTION

Efficient mobility management in heterogeneous network environment can enhance the freedom of the ever demanding mobile user. Not only the coverage area can be extended, but the user can achieve the always best connectivity in terms of quality and cost. In order to get the maximum benefit from the most desired network, it is required to ensure that handover is triggered at an appropriate instance. Not only that connectivity with the most desired network is maximized, but also the handover failure is maintained at an acceptable level. WLAN is usually the choice from the available networks due to its high speed and low cost. However, due to its small coverage area, the high speed mobile user can benefit from WLAN to a very limited extent. There is a need to optimize the handover trigger condition for an MT moving out of the WLAN coverage area. The distance, a moving out MT would cover in the coverage area, after the handover is triggered, is critical distance. If the the handover signalling is not completed within this critical distance the transfer of the session to the target network would result in a failure. In [1], Mohanty derived the probability density function (pdf) of critical distance under the assumption that the boundary region is square in shape and the angle of departure is uniformly distributed over that square region. In another work [2], Mohanty and Akyildiz derived the pdf of critical distance under the assumption that the boundary region is triangular in shape and the angle of departure is uniformly distributed. In this work, we obtain the pdf of critical distance in a circular WLAN region without making assumption for the pdf of angle of departure. Our analysis leads to a new method for handover triggering condition estimation. This study also reveals that the choice of the pdf of departure angle, which is not known in real scenarios, has a very little impact on overall performance.

Related Work

In order to support mobility of mobile node, many studies have investigated various numbers of ways to improve handover performance. In this section, we describe the existing handover triggering schemes. By employing file transfer protocol (FTP) and voice over internet protocol (VoIP) applications, a comparison was done on received signal strength indication (RSSI) and the number of the handover decision criterion [1]. The effectiveness of as the handover decision criterion was examined in terms of performance degradation due to reduction of signal strength and radio interference with other wireless local area networks (WLANs). It was shown that the transmission control protocol (TCP) good put decreased soon after the occurrence of the frame retransmission. As such, these results showed that TCP good put performance began to deteriorate when frame retransmission occurs. Thus, the number of retransmission was proven to be potentially useful to serve as a handover decision criterion in order to avoid TCP performance degradation. Through experiments, the signal strength was shown to be insufficient to detect performance degradation due to interference especially when signal strength was reduced due to mobile node's movement or intervening objects. Therefore, they concluded that the number of transmission, unlike signal strength, was able to promptly and reliably detected performance degradation due to radio interference and reduction of signalstrength. As such, frame retransmission served as a good indicator as a handover trigger parameter. Three new algorithms to trigger handover; Hysteresis, Trend and Least Squares Estimator (LSE) had been proposed [2]. Hysteresis used information on all the access points operating on the current channels to issue a trigger as soon as the received signal strength indication (RSSI) exceeds the current access point (AP) plus a hysteresis factor. The rate of change of received signal strength was used by Trend to trigger handover. The value of signal in the next time interval was predicted by LSE. LSE then used this information to trigger handover when LSE for the new access point minus errors exceeds LSE of current access point plus error. In the absence of better access points, all the above schemes did not forced any action. However, if the default handoff method detected serious link deterioration, then a scan-based handoff was triggered. The three schemes stated above only judged against the rest of the APs operating in the same channel only. There could be an AP with much stronger RSSI operating on another channel, but the schemes might handoff to an AP with relatively weaker RSSI just because it was in the same frequency band. The proposed scheme however, was managed to reduce scanning delays at the cost of potentially lower throughput. This scanning delay however could be resolved by using two radios [3,4]. The experiments run were also not tested in the presence of access points operating on overlapping channels.

A summary of the existing handover triggering mechanisms had been listed [5]. Handover Initiations were generally based on relative signal strength, relative signal strength with threshold, relative signal strength with hysteresis, relative signal strength with hysteresis and threshold and prediction techniques. Handover initiations based on relative signal strength chose the strongest received base station continually. This method was shown to generate many unnecessary handovers when the current base station was still sufficient. Relative signal strength with threshold allowed a user to handover only if the current signal was adequately weak, less than a threshold. On the other hand, relative signal strength with hysteresis allowed user to handover only if the new base station was adequately stronger by a hysteresis margin than the current one. Relative signal strength with hysteresis and threshold handovers to a new base only if the current signal level dropped below a threshold while the target base station was stronger than the current one by a given hysteresis margin. Prediction techniques however made handover decision based on the expected future value of received signal strength. These were the usual handoff techniques. A study on the signal strength model of mobile node had been carried out [4]. Based on the study, a new vertical handoff design algorithm on vertical handoff between 3G and WLAN had been proposed. This algorithm could be adapted to the change of mobile node's velocity, thus improving the handoff design algorithm. An efficient handoff decision algorithm, MMRE (Motion Model based RSS Estimation) that depended on the influence of velocity to improve handoff efficiency was proposed. MMRE worked by adapting to the change of mobile node's velocity. In addition, three performance evaluation models were proposed to verify the algorithms feasibility and effectiveness in simulations. Finally, results showed that handoff efficiency had been improved significantly. Therefore, we took speed into consideration as well in our proposed algorithm. A design on a handover mechanism to switch ongoing calls to the cellular network when the 802.11 network could not sustain call quality had been proposed [3]. As such, a quality-based trigger for handover of voice calls to cellular network was implemented. With this in mind, an automatic handover solution for real-time voice session on 802.11 networks to the cellular infrastructure was designed. The algorithm used sum of signal strength, loss,jitter and report losses as the handover score. Unfortunately, the signal strength reading tends

Overview of the Handover Triggering Condition Estimation Process

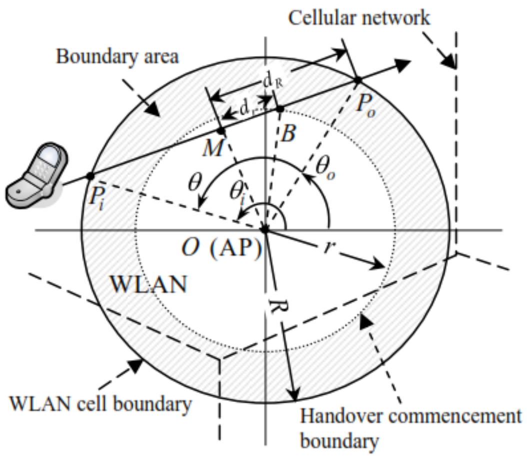
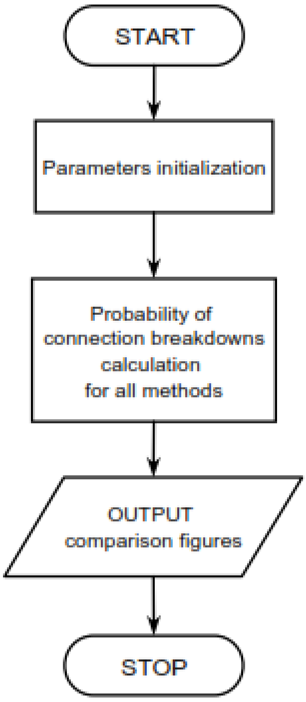


Figure 1: diagram of WLAN to cellular network handover triggering condition estimation mechanism.

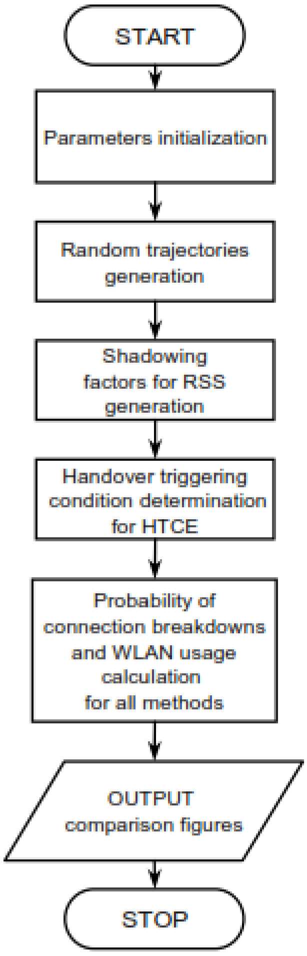
The Handover Triggering Condition Estimation Process is short formally called as HTCE determines a proper time to initiate a handover out of the currently connected network to prevent connection breakdowns as well as to maximize the usage of the preferred network. It takes AP power level, RSS samples, the estimated radius of the WLAN (the radius of the WLAN cell using RSS samples and the AP transmit power, as the described literature survey the velocity of the MT, the handover latency and the connection breakdown probability requirement as inputs, generating the handover triggering condition as its output. The block diagram of HTCE is shown in above figure shows the trajectory of a MT traveling over an area over which cellular network service is available and is also partially covered with a WLAN cell. The MT enters and exits the WLAN cell at points Pi and Po, respectively, following ga straight line. M is the middle point of the section of the trajectory inside the WLAN cell. The donut shaped (dashed) area is called "boundary area". The radii of the outer and inner circles enclosing the boundary area are R and r, and dR and dr represent the half length of the trajectory segments inside the outer and inner circles respectively. B is the intersection point of the trajectory and the inner circle. When the MT enters the area of WLAN coverage at point P the algorithm proposed is applied to determine whether a handover to the WLAN is beneficial or not. If a handover is necessary, the MT switches to the WLAN. Then, the MT continues its trajectory, and beyond the point M, the RSS of the AP starts deteriorating. Here, HTCE is used to determine the point at which the handover back to the cellular network should occur.

Flow chart for implemntation

A flow chart of the above handover trigger for the theoretical performance evaluation of HTCE is included in the flow chart



Fig(2) Flow chart for therotical analysis of HTCE



Fig(3) Flow chart for therotical analysis of HTCE with the parameters

CONCLUSION AND FUTURE SCOPE

In this research paper a new method for finding LBS based on GUI developed web frame work in matlab is proposed. The frame work consists of accepting the input as IPv4 address and converts corresponding IPv6 address and finally display their latitude and longitude. Which save the time and hardware chip for find GPS.

REFERENCES

[1]. S. Mohanty, "A new architecture for 3G and WLAN integration and intersystem handover management," Wireless Networks, vol. 12, pp. 733–745, 2006.

[2]. S. Mohanty and I. F. Akyildiz, "A cross-layer (layer 2 + 3) handover management protocol for next-generation wireless systems," IEEE Trans. Mobile Comput., vol. 5, pp. 1347–1360, 2006.

[3]. M. Ruggieri, F. Graziosi, and F. Santucci, "Modeling of the handover dwell time in cellular mobile communications systems," IEEE Trans. Veh. Technol., vol. 47, no. 2, pp. 489–498, 1998.

[4]. X. Yan, Optimization of Vertical handover Decision Processes for Fourth Generation Heterogeneous Wireless Networks, PhD thesis, Australia, Monash University, 2010.

[5]. F. A. Haight, "Some probability distributions associated with commuter travel in a homogeneous circular city," Operations Research, vol. 12, no. 6, pp. 964–975, 1964.

[6]. F. P. Fontan and P. M. Espineira, Modeling the Wireless Propagation Channel: A Simulation Approach with MATLAB, Wiley, 2002.

[7]. Frederic Paint, Paal Engelstad, ErikVanem, Thomas Haslestad, Anne Mari Nordvik, Kjell Myksvoll, Stein Svaet, "Mobility aspects in 4G Networks- White Paper.

[8]. 4G Wireless Networks: Opportunities and Challenges by Hassan Gobjuka

[9]. Albert0 Montilla BravoAdvanced Positioning And Location Based Services In 4G Mobile-Ip Radio Access Networks 2010 IEEE.