
A SURVEY ON HANDOVER BETWEEN DIFFERENT HYBRID WIRELESS NETWORKS

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Abstract: In the past 25 years cellular communication has grown rapidly and similarly the numbers of users have increased tremendously. Next generation mobile communication is intended to have better quality of services levels and this can be achieved when there is interrupted services. Thus mobile communication has an important feature of handover. In this paper we are going to discuss handover between different hybrid networks. It has been proposed that the Fuzzy logic approach can provide better results than conventional approach.

Keywords- Handover, fuzzy logic, QoS, mobile communication.

Introduction: Currently, hostile wireless and mobile networks Worldwide Interoperability for Microwave Access (WiMAX), Wireless Local Area Network (WLAN), Third Generation (3G) mobile communication such as (UMTS) Universal Mobile Telecommunications Systems, Wideband Code Division Multiple Access (WCDMA) have arisen and uninterruptedly developed to attain high-speed transmission[1]. During communication, when the user crosses the coverage zone, it is better to use the wireless means of the new neighbouring base station if the power of signal in the earlier base station is feeble than the succeeding one that is the target base station[2]. In this paper, we will take into consideration different hybrid networks such as UMTS-WLAN, WLAN-WIMAX and WIMAX-UMTS and hand off between them based on some parameters which are considered to be helpful for providing better quality of service[3].

Related Work: WANG Yihongi et al.[3] proposed a handover scheme for WLAN and GPRS. Handover latency can be reduced using bidirectional connection. The bidirectional connection also improves the quality of service.

Fatma Tansu and Muhammed Salamah[4] proposed an algorithm is offered to evade the redundant handoffs for such networks under different situations. Rajiv Kumar and Rajesh Khanna[5] had proposed fuzzy based approach is offered for handover between UMTS and WLAN networks. The outcomes with the fuzzy enhanced scheme are improved and reliable.

Jia Ding*, Xiaoping Xue, Gang Li[6] Proposed a handoff resolution procedure that joined RSS technique and fuzzy logic centred several feature decision making. The procedure studies all round features that affect QOS and user's preferences. Dong Ma and Maode Ma[7] Proposed handoff structure for WLAN and WiMAX interworking networks with objective to deliver always best facility to users. They proposed a technique by which handoff process will not only be activated by unaccepted signal power but also by unsatisfied quality of service parameters.

Simulation results show that the suggested scheme can retain stations always is best connected with their QoS necessities met.

G. Arul Prasath et al[8] proposed a combined model and a base station aided programming mechanism to be realized at the CPE to provide quality of service guarantee.

Ruby Verma & Pankaj Garg[9] has presented a paper in which performance study using the fuzzy logic model is done and the combination of UMTS and WiMAX network is reserved as an example to present that the proposed vertical handoff decision procedure and selects the finest access network that is adjusted to network conditions, QoS necessities, RSS, bandwidth necessities.

Yu Liu, Chi Zhou[10] has proposed a method to provide worldwide access anyplace anytime by wrapping the far-flung areas using WiMAX and UMTS. In this offered scheme to integrate WiMAX and UMTS, definite areas are sheltered by both systems. The covering areas are modelled as WiMAX cells overlaid with UMTS cells due to the larger coverage of WiMAX.

Mrs Jayasheela CS and Dr. Gowrishankar[11] has proposed that a vibrant, adaptive and effective method is essential to implement the handover mechanism in succeeding generation diverse wireless networks to yield an effective service for the user by seeing active and inactive parameters.

M.sazeeda kausar and Dhanaraj cheelu[12] has proposed a quality of service aware fuzzy rule centred VHO. Using fuzzy logic quantitative decision algorithm was used as a handover decision measures to select which network to handover among dissimilar available access networks. The quality of service parameters considered are obtainable bandwidth, end-to-end delay, jitter, and bit error rate (BER). Simulation consequences express that related to VHO procedures, the suggested procedure gives better performance for different traffic classes.

Handover in integrated network of UMTS and WLAN: Interworking between UMTS and WLAN can

be used to pursue two advantages of both high speed access network and a broad cell coverage fig1[3].The Universal Mobile Telecommunication System (UMTS) provides fast mobility over a huge coverage area and comparatively low data rates. Although WLANs have a lesser coverage, they can support fairly high data rates related to UMTS. Thus interworking between UMTS and WLAN has been a widespread problem to use benefits of both systems[4].The integration of UMTS networks and WLAN will comprise of a different network that integrates the benefits of the two of them[4].

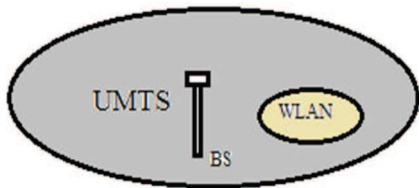


Figure1: Integrated network of UMTS and WLAN

The key purpose of integrating UMTS and WLAN is Mobility support. Handoff decision is made created on the nature of application running on the mobile node[5].Then depending on the rule base intended for activating the handover, the expected signal strength, speed of mobile node and bandwidth are used as input parameters[3].

Handover in integrated network of WLAN and WIMAX: Handoff scheme for WLAN and WiMAX interworking networks is suggested with purpose to provide always best service to users. Wireless LANs (WLAN), which has been widely deployed for the broadband wireless access due to their low cost and high capacity[6]. Meanwhile, another family of standards-IEEE 802.16 provides detailed conditions on the emerging broadband wireless access technique, WiMAX which has involved plentiful attention lately due to its assured high bandwidth over long-term transmission with QoS supports[7].

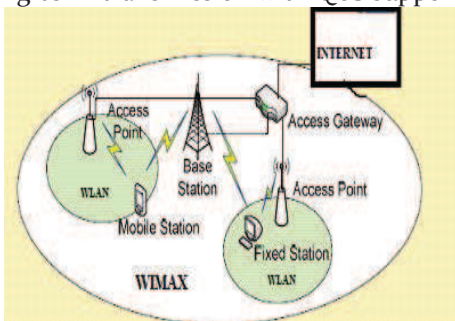


Figure2: Integrated WIMAX and WLAN networks

The combination of WLAN and WiMAX is an auspicious method to implement constantly best connected service by broadband wireless access techniques[7]figure2.In this paper, we will confer the handover between these two IEEE standard

technologies[6].

Hand over in integrated network of WIMAX and UMTS services: A handoff decision can be made between the 3rd generation and the 4th generation technologies based on some parameters. When a mobile terminal is connected to the UMTS and WIMAX is available there then a decision for handover is taken based on some input parameters[9]and the whole condition is evaluatedand decisionwhether the handover is required or not to maintain the quality of services. Figure 3 shows an integrated network of UMTS and WLAN.Similarly when the mobile terminal is connected toWIMAX and UMTS is available then predecisionsare taken to avoid the unnecessary handovers[10].

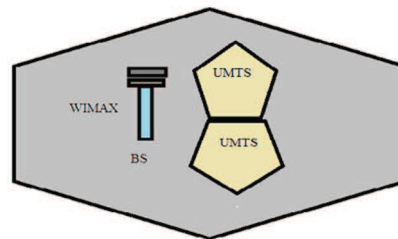


Figure 3: Integration of WIMAX and UMTS

Proposed approach: The next generation wireless communication systems target to offer users with the ease of entire continuous connection to access several wireless technologies which delivers the best Class of service[9].The parameters [11][12] considered in this paper are:

1. Available bandwidth-To deliver continuous handover for quality of service in wireless atmosphere, there is a prerequisite to accomplish bandwidth condition of MN during movement. Higher delivered bandwidth guarantees less call dropping and call blocking chances; hence higher output.
2. End-to-end delay-End to End delay mentions the time taken for a packet to be transferred across a network from transmitter to receiver. The proposed fuzzy logic approach can provide improved performance for end to end delay [12]
3. Jitter-Jitter is the deviation in the time period of packet arrival. It is required to reduce the jitter in handover scheme.
4. Bit error rate (BER)-When the BER increases above the threshold value then there arises a need for handover. For deciding handover bit error rate gains are calculated [13].
5. Received signal strength- As the RSS of the adjacent system rises above the edge the VHO is possible[14] i.e. the handover takes place if and only if signal strength of received of the base station is above the edge value.

6. Throughput-Throughput denotes the normal data speed of effective data or note delivery over any communications link. A decision function EDHMHN and a multi criterion VHO algorithm has taken throughput as an important parameter for deciding handover.
7. Velocity-If a (MS)'s speed is high and its movement form is uneven, needless handovers possibly happen more frequently.
8. Power consumption-If the battery level falls, switching for a network to some other network with less power consumption can provide a more usage time. In these conditions, it is rather transferred to an attachment point, and this will prolong battery life.
9. Cost factor-The cost is to be reduced during vertical handover in wireless networks. In that atmosphere, multi-interface terminals should flawlessly shift from one network to other in order to get enhanced performance or at best to preserve an uninterrupted wireless connection. Therefore, cost of network selection is important in handoff decisions.

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