



A Review of Improving Latency and QoS Using Various Vertical Handover Algorithm in MIH IEEE 802.21

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Abstract— Now a days everybody is using the new and fastly emerging technologies like UMTS, 3GPP etc. For using these technologies the important factor is to find the appropriate neighbor access network during handoff processing the mobile node. We require handover because in this heterogeneous environment, there can be several networks (Wi-Fi, WIMAX and UMTS) in a geographical area which are not so interoperable. For abiding the services we use Media Independent Information Service (MIIS) provided by IEEE802.21 MIH standards to select the most suitable network. This paper presents various challenges of handover and their solutions. Finally out of many issues the perfect solution for the vertical handover is made.

Keywords— Media Independent Handover,802.21

I. INTRODUCTION

Current years have observed the discharge of mobile communications, mutually with an exponential make use of the Internet for purpose like as video conferencing, voice calls or Mobile TV. Constructing and working multi mode systems can develop in to extremely compound but every entrance machinery has to be addressed straightly and independently through the organize things in the network. It grows to be yet inferior in the case of handovers among different accesses, since this needs assured degree of organization across the special equipments. IEEE 802.21 work [1] allows the mobility to and from 3G cellular systems for this. Though, cellular structural design is diverse from that of 802.x tools, and provides an increased level of complexity. Cellular or worldwide Mobile Terrestrial Service access is supplied through an investigational software radio platform that features a direct-interconnection among IP protocol and UMTS atmosphere border, and in that logic presents an IP connectivity secure to that of the LTE form.

IEEE allows Media Independent Handovers (MIH) – IEEE 802.21 [2]. IEEE 802.21 explains a theoretical structure that optimizes and enhances parallel and perpendicular handovers through supplying knowledge regarding the link layer techniques to the upper layers.

MIH supplies QoS materials asking for the applicant approach technologies and after the purpose approach, technology is chosen via mobility decision algorithm, MIH suggests the ability to execute the QoS resources. Because the time delay among the resource's uncertainty and stimulation might not be negligible, and the network setting in the objective approach technology can modification throughout this time, MIH structure has to be capable arrangement QoS resources in the destination network earlier to their motivation assuring their accessibility for prospective exertion. Furthermore, MIH architecture permitting for a coherent inter-technology handover procedure[2].

They demonstrate the inclusive building design of IEEE 802.21. Figure 1 appearance the understandable diagram of the inclusive framework of the distinctive nodes in 802.21 network. It displays a Mobile Node with 802 equipment and a 3GPP one, and that is presently combined to the network through the 802 interface [3].

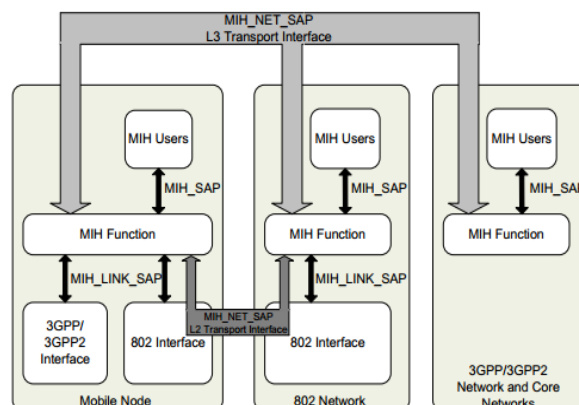


Figure 1: Framework of MIH (Media Independent Handover) [3]

- A. As disclosed in figure, all 802.21 compliant nodes have a shared structure neighboring a middle substance called Media Independent Handover Function. The MIHF exposes as an intermediate layer between the higher and bottom layers whose primary role is to coordinate the change of knowledge and controls among the distinctive devices concerned in getting handover outcomes and enforcing the handovers. The connections between the MIHF and the additional operational substances such as the MIHF users and the lower layers are placed on a number of defined service primitives who are collected Service Access Points (SAPs). Several SAPs are contained in the 802.21 standard [3]: MIH SAP: This connects permits transmission between the MIHF layer and the higher layer MIHF users.
- B. *MIH LINK SAP*: It is the coordinate between the MIHF layer, and lower layers of the protocol stack.
- C. *MIH NET SAP*: It is an interface that maintains the substitute of data between remote MIHF entities. It is worthwhile that all connections between the MIHF and lower layers are concluded by the MIH LINK SAP. This SAP has been outlined like a media independent interface popular to all technologies.

II. MIH SERVICES

A. Media Independent Event Service

This work will be used to discover the need for handovers [4]. For example, a sign that the link will intermission to convey MAC SDUs at some point soon. This decreases time interpreted to handover between attachment locations .

Table 1 is a subset of the recommended occurrences for the 802.21 event service [5]. Event 3 will supply higher layers with a prognostic mark of network demotion. Internally, 802.21 purposes signal determination as an indicator of approaching link failure

TABLE 1: 802.21 EVENT SERVICE – EVENT LIST [4]

Event Id	Event Type	Event Name	Description
1	State Change	Link Up	L2 connection has been established
2	State Change	Link Down	L2 connection has been broken
3	Predictive	Link Going Down	L2 connection loss is imminent

B. Media Independent Information Service

Media Independent Information Service supplies a structure and complementary appliances beside that MIHF individual may determine and acquire network knowledge existing inside a geographical zone to forward the handovers. MIIS basically supplies a fixed of IEs the authenticity's configuration and its interpretation and a justification type of approach for knowledge relocation. With the asynchronous devalue model of data change for the event work [4].

C Media Independent Command Service

The precept maintain empowers higher layer, locally or remotely, to manage the physical link and logical link layers. The higher layers manage the reconfiguration of an suitable link using a set of handover directives. For example, the command service could be used to desire a mobile node to switch among links. [4]. The necessary purpose of MIH is focused on around the consequent three main principles [3]:

The structure that facilitates seamless handover among heterogeneous technologies. This structure is established on a procedure stack executed in all the devices concerned in the handover. The explained protocol stack purposes at on the understanding the required fundamental interactions between devices for optimizing handover conclusions. The explanation of a new link layer SAP that approaches a usual interface for link layer purposes that is autonomous of the technology specifics. For every of the technologies lie in 802.21, this SAP is plotted to the complementary technology-exact primitives. The popular representation includes some of the samplings. The definition of a set of handover enabling functions that provide the upper layers (like e.g. mobility management protocols such as Mobile IP [6]), with the needed practicality for acting raised handovers. These roles trigger, via the 802.21 framework, the corresponding local or remote link layer primitives.

The paper is further is organized as under: Section II provides the literature review. Section III includes the challenges on MIH. Section IV includes the conclusion and future work of this research.

III. RELATED WORK

Vertical handover is a technique of operating the handover among various wireless technologies, including the three steps: network detection, handover judgment and handover performance. In the network detection step, an MN receives the neighbor net instruction like expense, network safety, jitter, bit error rate , and so on. By applying the acquired neighbor network instruction, the MN or IS determines the desired net that will be related in the handover judgment step. In the handover performance step, the MN handovers to the desired network. The role

IEEE 802.21 MIH is included in plan detection and handover judgment step. In this section the review of vertical handoff algorithms on the basis of MIH standard [7] is provided.

Kim et al. [8] displayed an improvement to existent MIH instruction server and introduced enhanced vertical handover process on the basis of improved information server. In this introduced process of wireless route, situations are assessed by utilizing spatial and temporal position at the EIS hence omitting the time consuming route scanning process. This process needs localizing methods or GPS to compute the measurements of MN's existing position. Simulation result shows that the introduced procedure eliminates the vertical handover latency under diverse environments.

In [9] Makris et al. introduced a mobile River vertical handover system on the basis of IEEE 802.21 structure. The benefit of introduced approach is that, it considers network specifications as well as user choices and therefore, gives service connection and improved procedure efficiency.

Other VHO schemes on the basis of IEEE 802.21 to promote vertical handoff among Wi-Fi and Wi MAX was introduced by Eastwood et al. [10]. The disadvantage of the proposed scheme is the absence of interaction among the MIH structure and the QoS specifics of acquire technologies. Performance computations of the introduced method are not provided.

Christakos et al. [11] displayed that the handover behavior can be enhanced for rapid Mobile IPv6 through Media Independent Information Service. Pre authentication permits the MN to support with the target whereas connected at another place on network. In this approach, MIIS is utilized to give Authentication instruction and hence minimizing the handover time. The restriction of the introduced procedure is that, an MIH signal to reveal the authentication of MN accompanied by PoA is not deliberated.

A handover decision algorithm applying MIH services is introduced in [12]. The algorithm is utilized to authenticate vertical handoff among Wi-Fi and WiMAX networks with QoS measure. The algorithm utilizes Analytic Hierarchical Procedure to compute the values of different traffic variables and applies simple additive weighting or MEM to compute the QoS record. The simulation outcomes shown that the introduced algorithm specifies shorter handover times and low-level dropping rate instead of the fundamental vertical handover process.

In [13] Neves et al. introduced improvement to MIIS, by joining context-aware instruction. The introduced context aware instruction server can deposit, manage and produce real-time dynamic instruction redeemed from together network and terminal bodies like user choices, mobile nodes attributes, running services, and provided network resources. The benefits of the introduced procedure are that, through a context-aware instruction server, the handover research and judgment steps are optimized.

Tamijchelyvet.al. [[14] optimized the vertical handover usefulness is demonstrated for varying WLAN/Wi MAX networks assist on IEEE 802.21. Media free Handover that mixes network usefulness from all distinct approach technologies into ordinary group of Events, Commands and Services. Introduced handover scheme is utilized to compute the vertical handover behavior, including multimode terminal with WLAN/Wi MAX coordinates and IEEE 802.21 substances. The ability displays a proficient solution for multi homing, mobility, and excursion for combination of varying networks. The introduced procedure can also eliminate considerably traffic overhead among Wi MAX /WLAN sets, handover latency and ground station scanning interval time. The available handover program terminates by using there service continuity during and after the vertical handover.

Daniel Corujo, Carlos Guimaraes, Bruno Santos and Rui L. Aguiar[15] displayed a programmed where they combine their middleware through an IP mobility management protocol, Proxy MIP IPv6, prominence ODTONE's sustaining features and effect though given a clear handover control framework for net basis generalized mobility management. They assumed that the ODTONE project not only provided an execution, forwards the norm and the connections area through an obtainable middleware framework which is utilized examine, expand and develop the boundaries of current and prospective framework, protocols, and mechanisms that direct to apply dispersed mobile management algorithms.

IV. HANDOFF CHALLENGES AND SOLUTIONS

The main challenges in vertical handover are optimum triggering and network access selection. Finding the accurate time to execute a handover is a crucial problem. Simply, during stimulate effects can a handover be originated and achieved effectively. For vertical handover, it requires to transfer the information in the form of signals. These signals may stand an essential overhead in a way of bandwidth and dispensation requirements including an important impact on the presentation of handovers. So, a type situation would be to reduce the signaling overhead while feasible in sort to recover and optimize the handover implementation. There exists three types of solutions for vertical handover i.e. multilayer mobility management (mobile IP), SIP with IP encapsulation and hybrid solution. In the solution of multilayer mobility management between two domains is obtained by using SIP for real time traffic and mobile IP with the help of location register for non real time traffic. Whereas in pure solution of SIP with IP encapsulation real time traffic can be handled by extended SIP and non real traffic by using SIP and IP encapsulation. In hybrid solution both SIP and mobile IP are used for real and non real time traffic. The hybrid solution is found to be better as it covers mobile IP as well as the SIP.

V. CONCLUSION

The reason of IEEE 802.21 is to recover the user knowledge through giving an MIH functionality which ease mutually mobile-initiated and network-initiated handovers. The standard identifies the tools compulsory to replace information, actions, and guidelines to make easy handover opening and handover research. IEEE 802.21 does not try to normalize the real handover implementation method. So, MIH structure is uniformly appropriate to schemes that use mobile IP by the

IP layer as to systems that utilize Session Initiation Protocol (SIP) at the application layer. In future, handover between Wi-fi to WLAN via WIMAX can be performed by using vertical handover algorithm in MIH.

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