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Enhanced a QOS Oriented Vertical Handoff Scheme for WIMAX/WLAN Overlay Networks

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Abstract:

Now a day, several of wireless communication technologies square measure migrating toward heterogeneous overlay communications. The combination of Mobile WiMAX and WiFi looks to be a promising approach attributable to their unvaried nature and complementary characteristics. During this proposed system, we have aaim to investigate many necessary problems for the interconnection of Mobile WiMAX and WiFi networks. We have anaim to address a tightly coupled interlinking design. Further, a continuous and pre active vertical handover theme is intended supported the design with aims to produce forever the most effective quality of service for nodes. Each the working performance of applications and network conditions square measure thought-about within the limited level. Moreover, we have anaim to derive analysis algorithms to estimate the conditions of each WiMAX and Wifi networks in terms of collection of information measure and packet delay. A simulation study has incontestable that the planned systems will keep stations forever being good connected. And we further proposing our enhancement to connect the node beyond the range of AP or BS.

Key words:

WIMAX, WLAN, mobility, 4G, Ad-hoc Network (as cognitive), Vertical Handover.

1.Introduction:

Mobility is that the necessary feature of a wireless cellular communication system. Normally, continuous service is achieved by supporting relinquishing (or handoff) from one cell to a special. Smaller cells as results of an active mobile station (MS) to cross several cells throughout a technique of data sharing. This operational call need to be transferred from one cell to a special one therefore on attain call continuation throughout boundary crossings.

The relinquishing methodology is transferring an active call from one cell to a special. Relinquishing initiation is that the tactic of deciding once to request a relinquishing. relinquishing decision is based on the RSS from the current BS and neighboring BSs. In our project we tend to face live assuming distance indirectly proportional to distance. relinquishing are usually classified victimization the network type involved into horizontal associate degreed vertical cases as associate MT moves among or between fully different overlays of a network. Horizontal relinquishing or intra-system relinquishing might be a relinquishing that happens between the APs or BSs of identical network technology. In various words, a horizontal relinquishing happens between the uniform cells of a wireless access system. Vertical relinquishing or inter-system relinquishing might be a relinquishing that happens between the assorted points of attachment happiness to completely different network technologies. Handoffs is also classified victimization the quantity of connections involved as soft or hard. A relinquishing is hard if the MT is commonly associated with only 1 purpose of attachment at a time. In various words, academic degree MT may originate a fresh association at the target purpose of attachment once the previous association has been torn down. A produce before break relinquishing happens if the MT can communicate with quite one purpose of attachment throughout relinquishing. throughout this case, mobile terminal association may be created at the target purpose of attachment before the previous purpose of attachment association is free. As associate example, Mobile terminal equipped with number of network interfaces can at a similar time attach with multiple points of attachment in various networks full of soft relinquishing. Mobile adhoc networks are dynamic networks throughout that nodes will move. A main performance constraint comes from path loss and multi-path attenuation. many Mobile ad-hoc network routing protocols exploit multi-hop ways in which to forward the messages. Likelihood of unbeaten packet transmission on a path depends on the untrustiness of the wireless channel on each hop.

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Throughout this paper, we tend to assume that each one node grasps their positions and velocities, and each and every node can live the house from AP and bachelor's degree which we have a tendency to area unit assuming metric by no of users. In our project, whenever vary of user can increase then metric will scale back. we tend to face live setting most four users mean Qos is sweet otherwise it's going to scale back. WiMAX is one of the foremost well likeable broadband wireless technologies around of late. WiMAX systems area unit expected to deliver broadband access services to residential and enterprise customers in an exceedingly low-cost means that. Loosely, WiMax may be a homogenous wireless version of native space network supposed primarily as another to wire technologies (like Cable Modems, connection and T1/E1 links) to provide broadband access to users premises. additional strictly, WiMAX is Associate in nursing business trade organization intentional by leading communications part and instrumentality companies to push and certify compatibility and talent of broadband wireless access instrumentality that conforms to the IEEE 802.16 and ETSI HIPERMAN standards.

WiMAX would operate constant as wireless fidelity but at higher speeds, over larger distances and for a bigger style of users. WiMAX has the pliability to provide service even in area unit as those are powerful for wired infrastructure to attain and so the power to beat the physical limitations of ancient wired infrastructure. WiMAX was intentional in apr 2001, in anticipation of the publication of the primary 10-66 gigahertz IEEE 802.16 specifications. WiMAX is to 802.16 as a result of the Wi-Fi Alliance is to 802.11. WiMAX is descriptor for Worldwide ability for Microwave Access. supported WMAN technology a wireless technology optimized for the delivery of knowledge science central services over an honest house. A ascendable wireless platform for constructing completely different and complementary broadband networks. A certification that denotes ability of kit designed to the IEEE 802.16 or compatible customary. The IEEE 802.16 unit develops standards that address a pair of types of usage models:

A fixed usage model (IEEE 802.16-2004).
A portable usage model (IEEE 802.16e).
WiMAX is such a simple term that people tend to use it for the 802.16 standards and technology themselves, tho' strictly it applies only to systems that meet specific correspondence criteria set down by the WiMAX Forum.

The 802.16a customary for 2-11 rate may be a wireless metropolitan house network (MAN) technology which can supply broadband wireless property to mounted, moveable and peregrine devices. WiMAX is anticipated to produce initially up to relating to forty Mbps capability per wireless channel for every mounted and portable applications, looking forward to the particular technical configuration chosen, enough to support several businesses with T-1 speed property and thousands of residences with line speed property. WiMAX can support voice and video moreover as web information. WiMax are to produce wireless broadband access to buildings, either in competition to existing wired networks or alone in presently unserved rural or thinly populated areas. it should be accustomed connect computer network hotspots to the net. WiMAX is in addition purported to offer broadband property to mobile devices. it would not be as fast as in these mounted applications, but expectations are for relating to fifteen Mbps capability throughout a 3 km cell coverage house. With WiMAX users might very cut free from these days' web access arrangements and be able to go online at broadband speeds, nearly wherever they like from at intervals a railway system Zone.WiMAX might probably be deployed throughout a form of spectrum bands: a pair of.3GHz, 2.5GHz, 3.5GHz, and 5.8GHz.

2. Related work:

In [1] paper, researcher addresses a movement-aware vertical (MAV) relinquishing rule between LAN and Mobile WiMAX for continuous present access. MAV relinquishing rule is planned throughout this paper to require advantage of movement pattern for avoiding redundant handovers among the integrated LAN and Mobile WiMAX networks. a novel MAV relinquishing rule is planned for interlocking between LAN associate degreed Mobile WiMAX to avoid Frequent handovers for a short amount of time and there is associate more chance of packet loss, delay unit poignant the final turnout but he considers only relating to the speed of mobile station but not relating to the other factors. In [2] paper, scientist considers the quality-of-service directed intersystem relinquishing between the IEEE 802.11b network and thus the overlay network. He proposes the relinquishing theme and rule that guarantee to at a similar time meet the three key QoS values, that is, minimum data rate the foremost information block delay and thus the most information error rate, for the number of downlink and transmission multi-service links.

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A relinquishing theme and rule is planned that guarantee to at a similar time meet the three key QoS parameters equally as a result of the foremost call-dropping likelihood and thus the foremost average vary of Ping-Pong event constraints but once the number of mounted stations among the IEEE 802.11b cell is high, station collision probability is to boot high and so the QoS desires of the mobile stations incoming at the IEEE 802.11b cell can't be happy a minimum of for the amount of time traffic. [3] Paper, investigator defines specific bandwidth-related metrics, focused on the scope and affiliation..

Considerably, he differentiates between the knowledge live of a link and thus the knowledge live of a sequence of successive links. a selected metrics, calculation techniques and tools unit accustomed estimate offered system of measurement and capability of the links but didn't take under consideration regarding the other factors like packet delay and bit rate. In [4] paper, man of science proposes a subject, named system of measurement use, to recycle the unused system of measurement whereas not changing the prevailing system of measurement reservation.

The theme of the theme is to allow different Selective Service System to utilize the unused system of measurement once it's offered. degree rule is planned that considers relating to the subscriber stations to utilize the unused system of measurement and it shows that it'll extra improve the final turnout by 45 once the network is among the steady state but it's only for uniform network and a light-weight overhead is gift.In [5] paper, man of science proposes a relinquishing theme with geographic quality awareness that considers the historical relinquishing patterns of mobile devices. HGMA can conserve the energy of relinquishing devices supported triggering of mobile devices from redundant relinquishing keep with their received signal strength and moving speeds and it contains a relinquishment candidate alternative methodology for mobile devices to intelligently select a collection of Wi-Fi access points or WiMAX boosters to be scanned.

A technique is planned to chop back the energy consumption of a relinquishing operation and put together to spice up QoS satisfaction relation to relinquishing devices but throughout this paper man of science discuss only relating to the energy consumption but not relating to the remaining factors in taking relinquishment decision.

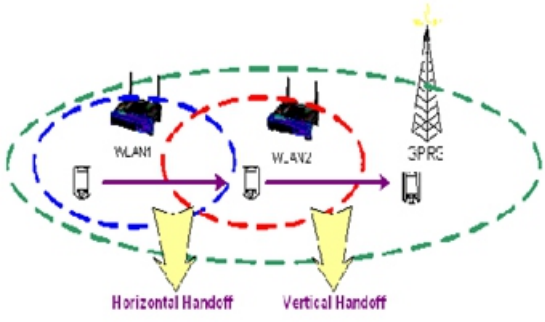

Fig.1 HO & VHO model

2.1. Existing system:

In existingQoS primarily based VHO ways in which for overlay networks, Quality of service parameters area unit thought of in relinquishing selections. However, the relinquishing procedures area unit commonly started once the stations move across the border of WLANs. As a result, the mounted stations and thus the mobile stations among overlapped areas cannot have the good thing about VHOs. Researchers planned a tightly coupled interlacing structure. Further, continuous and proactive vertical relinquishing theme is meant supported the look with aims to provide invariably the foremost effective quality of service for users. Attributable to the recently developed WIMAX, there are some advantages, but still restricted proposals created for VHOs in WIMAX/WLAN overlay networks. scientistplanned schemes can keep stations invariably being best connected. but once system is out of the vary then no communication during this model.

2.Proposed technique:

In our project we tend to stand live implementing the adhoc technology in infrastructure system cited as psychological feature radio network. In our model, whenever system is out of vary of all all-time low station and AP. Then it'll shares the data though' the PU once component is free. Throughout this model we tend to stand live considering requesting device as a result of the secondary device which one helps to create communication that is primary user. Psychological feature radios are cognizant of their surroundings and data measure accessibility and area unit able to dynamically tune the spectrum usage supported close to radios, location, and time of day and various parameters.

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This provides for plenty of economical use of the spectrum and high priority communications to need precedence if needed. Psychological feature radio has a pair of forms of users like primary and secondary user.

Advantage:

Our planned schemes can keep stations invariably being best connected, quite previous methodology, once it's in outside jointly.

Algorithm:

In this paper, we tend to research the mixture and VHO issues in WIMAX/WLAN overlay networks which we have a tendency to gift the speculation implementation model as bellow.

Step1: Initializing a mobile node it can access both WiMAX/WLAN.

Initialize WiMAX/ WLAN networks.

Step2: Node will check the available networks.

Step4: If { network available } {

If {only one network } {

Get communication from that.

} else {

For {each network} {

Checks which are the best network… {Bandwidth and packet delay}

Theory calculation…

Bandwidth calculation for wimax

$$\begin{cases} B_d = \left(1 - \frac{AAS_d}{s_d}\right)\frac{\delta_d s_d}{T_f} \\ B_u = \left(1 - \frac{AAS_u}{s_u}\right)\frac{\delta_u s_u}{T_f} \end{cases},$$

Delay calculation wimax

$$t = t_s + t_q + t_m + t_t.$$

Bandwidth for wifi

$$BW = B_0 - L\frac{NAV}{T_n + \frac{1}{2}T_{n,c}(N-1)},$$

Delay for wifi

$$t = t_q + t_a = \frac{\lambda t_a^2}{1 - \lambda t_a} + t_a.$$

}

Step5: Mobile node compares both networks

VHOM selects best

3.Performance analysis:

For our analyzing purpose we tend to square measure victimization the tool NS2. By victimization Ns2 we can show the paradigm model of VHO with improvement like ad-hoc property.

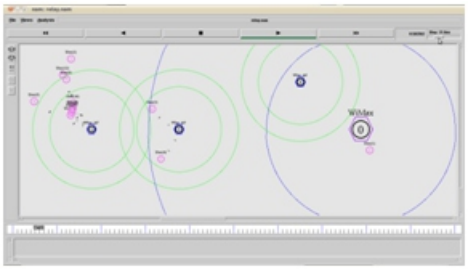

Fig.2 Nam output for VHO model

During this Nam window output we tend to square measure implementing model of WIMAX and WIMAX. During this model there square measure the fifteen nodes (WIMAX and LAN and Mobile nodes) offered. During this model, if mobile node is out of the vary of LAN and WIMAX mean it can't get communication.

Fig.3 Nam output for VHO-with ad-hoc type

In our increased paradigm model, we tend to enforced VHO with ad-hoc property. Therefore whenever node not within the coverage of and AP or BS then node will seek for another mobile node that has enough additional information measure. If mobile station having additional information measure then that node progressing to act as a primary user and looking out node is acting as secondary user. If primary user is detected by the secondary user mean secondary user will create communication through the first user.

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Graphs:

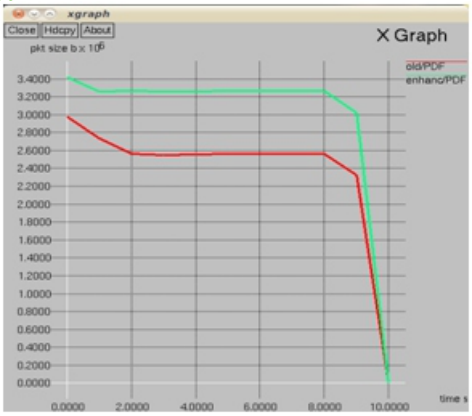

Fig.4PDF graph of existing and enhanced systems

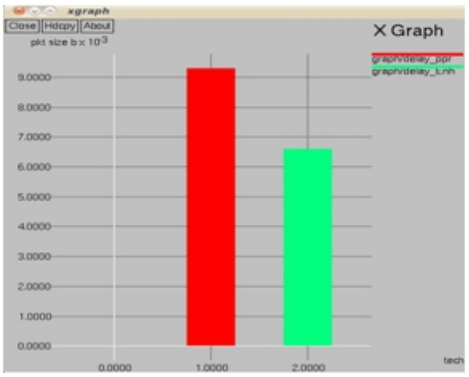

Fig.5Delay between existing and enhanced systems

Conclusion:

In this paper, we aimed to investigate many vital problems for the interlinking of LAN and WIMAX networks. We have resolved a tightly coupled interlinking design because the platform of our theme and that we improved potency of the network by together with Ad-hoc property. From our result, we proved communication can be extendable beyond the coverage area. In our future work, we have to study the in depth details to improve the connection area based on the mobile adhoc cognitive radio.

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