Research Article

Implementing and Experiencing Quality of Mobile Node in Network

Rohini H.Meshram[À*] and Amit R.Welekar[B̃]

[À]Wireless Communication Computing Department, RTMNU University,TGPCET,Nagpur
[B]Information Technology Department, RTMNU University, TGPCET,Nagpur

Abstract

In our paper how we achieve a mobile coverage at any time even if the cellular coverage is not present. In this project we are studying the coverage capacity provided by different network service providers (NSP) and then will implement such a system, which will increase the coverage capability for our mobile node. So, our proposed system will provide the coverage to mobile nodes where, the service provider of that network will fail to provide the service. In such cases we will use different frequency available in the spectrum for communication. Our proposed system will provide & increase the mobile coverage by borrowing the others network, which will available at that time. So the solution for it the mobile node will borrow the coverage from the other network if the network is not present at that same time. The propose system will work for improving the coverage capacity heterogeneous network for using different frequency available in the spectrum. In our propose system we implement such system in which we can communicate at any point even if the network is not available in particular node. So we implement such node they having same frequency and different frequency of network. And we implement the same frequency part of node means if the frequency is same then they can able to communicate with each other.

Keywords: MN (Mobile Node), NSP(Network Service Provider),BS(Base Station),CN(Communicating Node).

1. Introduction

The heterogeneous network having several combination of different radio technology all working together to provide the best service. In present network if the mobile node wants connect with other node it will connect to nearest base station and then connect to communicating mobile node if the network service is available. But in our paper we introduce the how mobile terminal get connection to other mobile network if the particular network is not available. Means we provide network connection if the network service is not available for that particular mobile node.

In our paper we study different available spectrum(ex.dish,defence,TV,satellite,etc).In handoff process the mobile node send its request to base station and then base station will send this call to the other base station. The handover

Mechanism having two types first one is Horizontal handoff and second is Vertical Handoff (K.Savitha,DR.C.Chandrasekar et al,2011).

The Horizontal Handoff the mobile node will switch with the same technology. Where as in Vertical Handoff mobile node will switching with different technology. In this paper we will implement such system in which we can call any time if the cellular coverage is not available in such situation we can use other frequency available in the

network. In initiation phase of handover it will collect all the available information of network related to the system such as access points, network cost, user preference. In this paper we will use the available radio frequency to connect to the base station to mobile terminal.
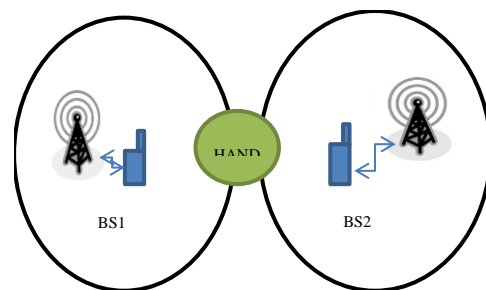

Fig.1. Handover Mechanism

2. Related Work

At present we there is all the other network which will help the other network to give their network service. In (K.Savitha,DR.C.Chandrasekar et al,2011) author discuses what technical use in vertical and horizontal handoff in heterogeneous wireless network. What kind of network selection done in performing the vertical and horizontal handoff.

In (Ms.Anita Singorva,Dr.Nupur Prakash et al,2007) author discusses the vertical handoff between the WLAN

---

*Corresponding author: **Rohini H.Meshram**

and cellular network. in this paper author discuss three steps for vertical handoff i.e. System discovery, Handoff decision and Handoff execution. Again the author will discuss the vertical handoff decision algorithm.

In (Ognen Ognenoski,Daniel denkovski,Vladimir atanasovski,Liljana Gavrilovska el at,2009) paper investigates the effect of vertical and horizontal handover in wireless system for different types of network.

In (K.Savitha,DR.C.Chandrasekar et al,2011) Network selection using TOPSIS and SAW algorithms for heterogeneous wireless network. The observation of author reduces the processing delay and trusted handover in heterogeneous network.

In (Xiaohuan Yan,Y.Ahmet S.Ekercioglu,Sathya Narayanan et al,2010) vertical handover decision algorithm in fourth generation heterogeneous wireless networks. In this paper comprehensive survey of VHD algorithm design to satisfy these requirement.

In (Enrique Stevens-Navarro and Vincent W.s.Wong) present the results for the performance of four different vertical handoff decision namely, MEW (Multiplicative Exponent weighting), TOPSIS(Technique for order preference by Similarity to ideal solution),SAW(Simple additive Weighting)and GRA(Gray relational Analysis).

In (Michiharu Nakamura,Takafumi chuja,Tamino saito et al,2008) paper the author studies the Standardization activity in IEEE 802.16 WG and WiMax forum. Detailed technique specification with various functionalities and wide range of parameter to accommodate various uses and deployment scenario are being developed in IEEE 802.16 WG. In (Ms.Farah M.Khan,Prof Satish K.Shah , Ms.Dharmishtha D.Vishwakarma et al,2012) author discuses to various approaches used to carry out handover process depending on the parameter involved in the particular technologies and handover decision algorithm and overview of handover process.

In(Dinesh Sharma,R.K.singh et al,2011) paper the author take care about the Quality of service(QoS) and Quality of end user experience(QoE).And again management of QoS and QoE in wireless communication.

In (Ashfaque Ahemed Khan,S.M.Imrat Rahman,Mohiuddin Ahmed et al,2012) paper present some of the cognitive radio research challenges which are crucial while applying the cognitive radio in order to determine the effectiveness and the reliability of wireless networks.

3. Propose System

In this paper we will implement the system in which if somehow in particular just like ruler area there is no network coverage of any company but the radio frequency is available at that time. So in such situation we will use such frequency band for communication in mobile terminal. So we calculate all the frequency available in the network and then select one of the as we suitable for that particular situation.

In Fig 2 there are two base station i.e A and B in that base station there is two node in each base station and again there is one other frequency is available .If node 1 can communicate with node 3 then it follows the path like

1-A-B-3.If both the base station is available but if base station A and B is not available then it uses other frequency C for same communication like 1-C-3.
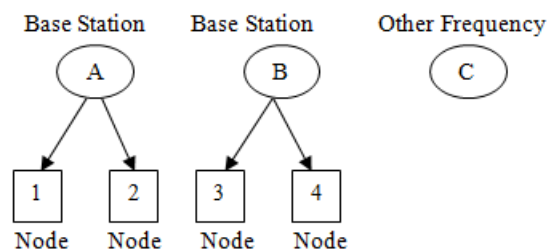

Fig 2 Structure of communication

Again we will implement if the base station is busy with all its channel then it will mobile node will borrow the other base station coverage if the channel is available for that network otherwise the mobile node will wait for movement when the base station will get release channel then accept its request. In (Ashfaque Ahemed Khan,S.M.Imrat Rahman,Mohiuddin Ahmed et al,2012) paper it will use the cognitive radio technology for beakless communication over the network. So we use such beakless communication at network to provide the quality of service to the user .In our system we sense the available spectrum and then call is forward to the radio spectrum to the base station and then communication is continue. The handover between one base station to other base station we studies in (K.Savitha,DR.C.Chandrasekar et al,2011) paper we apply handoff algorithm for this technique.

4. Methodology

In our system we use the available frequency which is available at that particular time and which is free to use then we select best of them and continue the communication. In such situation what we exactly do we set the available frequency in different channel of our device and then use one of them for further break less communication?

For improving the quality of network and improve the network efficiency so we use following module to achieve our goal.
1.RF trance receiver:- RF trance receiver which is used to transmit the message between two nodes. RF module providing easy and flexible wireless data transmission between devices. It has 2.4 GHz carrier frequency for communication. In this module we can set the frequency in different channel available in this particular device.
2. Microcontroller Board:- We use microcontroller board which is fast in speed and more memory. This microcontroller board ability to have connect keyboard, joystick, mouse, etc.
3.Keyboard:-In our system we use data communication between two nodes. So we use keyboard to give the input to the sender node and then it will sent this message to the other node via base station.
4.Display device:-The display device which is use to display the message when it is send to other node. It will show the message of which is communicated by node.

The using of above devices we achieve the goal of this paper. Using RF trance receiver we can send data communication using wireless node. Wireless communication is used to transmit the message between two nodes so we use such system to exchange the message between two nodes.

In our propose system what we exactly do the sender node will search all the possible available frequency in that particular area and which is free to use for everyone. Then we will select the available of them and then communication is done in that particular frequency. The RF trance receiver will set all the frequency in different channel and then it will select one of them for communication. In heterogeneous network we use different network selection possible this why we select the heterogeneous network and vertical handoff is possible.

4. Discussion

In our propose system we use RF trance receiver which is used to transmit the message between two wireless node.
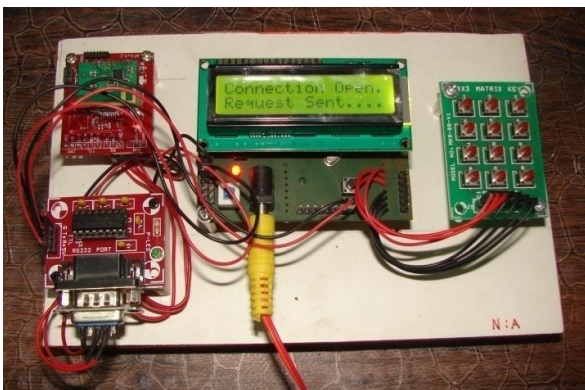

Fig 3. Communication Node

Fig 3.shows the communication node in this node we use RF trance receiver, microcontroller, LCD display and input system. By using this node we can communicate with other node. The above node the power supply is nedded,so we use adapter for that.

In discussion part we implement such system in the node can communicate with each other if they having same frequency in same channel. And in next part suppose in our node have no coverage then they will borrow the network of different base station for communication using different channel. When the node first search all the available network which is free for use and then it will select one of them. After selecting it will send request for connection after that receiver side node accept its request and after that it will start communicating with each other.

5. Conclusion and Future Enhancement

So we use heterogeneous system for handoff process between spectrum and base station. Because the heterogeneous system use if we want to communicate between two different network and use vertical handoff.
In our topic we studied various paper related to this topic and we conclude that the heterogeneous network is better

for our system that we want to propose because the heterogeneous network combine several different network (K.Savitha,DR.C.Chandrasekar et al,2011).

In our propose system we exactly send message between two active node so we studied all the RF trance receiver, input devices, display device and microcontroller. The microcontroller will use for controlling communication between node and all the peripheral devices which is used for the communication node. The network service provider will manage all the available network and then provide service to the mobile node. And then send the message to the other node. The communicating node will select best network available of the other entire node.

References

Farah M.Khan,Prof Satish K.Shah ,Ms.Dharmishtha D.Vishwakarma(2012),A Review on Media Independent handover Services for Heterogeneous wireless Communication Networks, *International journal of Electronics and Computer Science and Engineering*,8(3),pp1870-1876

Ashfaque Ahemed Khan,S.M.Imrat Rahman,Mohiuddin Ahmed(2012),Research Challenges of Cognitive Radio, *International Journal of Engineering research & Technology*, 1(3),pp 1-4.

Dinesh Sharma,R.K.singh(2011),QoS & QoE Management in wireless Communication system, *International Journal of Engineering Science and Technology*,3(3),pp2385-2391.

K.Savitha,DR.C.Chandrasekar(2011),Network selection Using TOPSIS In vertical Handover Decision Schemes for Heterogeneous Wireless network, *IJCSI International Journal of Computer science* Issues,8(3),pp400-406.

K.Savitha,DR.C.Chandrasekar(2011),Trusted Network selection using SAW and TOPSIS Algorithms for Heterogeneous Wireless Networks,*International Journal of Computer Applications*(0975-8887) ,26(8) ,pp22-29.

Xiaohuan Yan,Y.Ahmet S.Ekercioglu,Sathya Narayanan(2010), A Survey of vertical handover decision algorithm in Fourth Generation heterogeneous wireless networks, *Computer Network 54*.

Khaled Ben Letaief,Fellow IEEE and Wei Zhang(2009),Cooperative communications for Cognitive Radio Networks,*Proceedings of the IEEE*,97(5),pp878-893

Ognen Ognenoski,Daniel denkovski,Vladimir atanasovski,Liljana Gavrilovska(2009),Enhancing quality of experience in Wireless Heterogeneous Networks, (*17th telecommunications forum TELFOR)*pp258-261.

Michiharu Nakamura,Takafumi chuja,Tamino saito(2008),Standardization Activities for Mobile WiMAX,pp285-291.

lan F.Akyildiz,won-Yeol Lee,Mehmet C.Vuran and Shantidev Mohanty(2008),A Survey on Spectrum management in Cognitive Radio Networks,(*IEEE Communication Magazine)*pp40-48

Anita Singorva,Dr.Nupur Prakash(2007),A Review of Vertical Handoff Decision Algorithm in Heterogeneous Networks, *4th International conference on Mobile Technology, Application and systems*,pp68-71.

Enrique Stevens-Navarro and Vincent W.s.Wong "Comparison between Vertical Handoff decision Algorithms for Heterogeneous wireless Network"

Mandeep Kaur Gondar and Dr.Sanjay Kadam(2011), Requirements of Vertical Handoff Mechanism In 4G Wireless Network, *International Journal of Wireless & Mobile Networks (IJWMN)*,3(2),pp18-27.