A Newly Proposed robust Campus Area Networking (CAN) model with novel MCC (Mobile Communication Configuration) protocol for mobile communications based on the concepts of Mobile Computing Architecture.

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Abstract: Mobile computing are one of the most trending culture of today's Information age to utilize the computational power of micro and macro devices such as mobile or other hand held devices with full fledge of technological rich computational tasks with ease to perform in a very accurate and reliable manner. But to connect these all micro devices with proper communicative coupling orientations in the form of mobile networking structure are really becomes a very typical and challenging tasks, because these all micro devices contains various utilities to connect them from one to another such as Bluetooth Technology, WI-FI Technology, but to use these utilities some limited number of devices have to be connected with each other and a very less amount of data have to be transfer at a minimum time instance. To achieve the productivity and maximum through put the need of the hour is that we have some potential mobile networking mechanisms which works as similar as computer networks and utilize all resources with full of its computational capacity and becomes a computationally rich. In this paper we proposed a ad-hoc networking model among various micro and macro devices such as mobile or other hand held devices in a small area spectrum generally called a Campus Area Network (CAN) using the full potential of mobile computing architecture and these type of networking possible among the mobile or some other hand held devices. We also proposed a new protocol name says MCC (Mobile Communication Configuration) with its header along the sizes of each parameters or modules which presently existed in the MCC header and also represent the packet structure with its data capacity size. Because this networking model works as a Local Area Network (LAN). These type of networking model suitable for small size of area such as offices, universities, institutions, campus etc. The detailed mechanisms of each module of this networking model are presented in the next upcoming sections of this paper.

Keywords: Mobile Networking Technology, Mobile Computing based Networking, CAN network of mobile computing, Mobile communication using MCC protocol.

I. INTRODUCTION

Mobile Computing [1] and ad-hoc networks [5] are one of the most trending culture of today's information age. Mobile Computing [1] is a type of human-computer interaction [2, 4] in which all computational works which have to done by computer through the usage of mobile communication [3]. Generally there are many advantageous properties and attributes of mobile communication some of them are Portability, Connectivity, Interactivity and Individuality. These features defined the main aspects of mobile communication [3] over communication through computers. Generally all mobile devices used wireless networks for their connectivity and also contains a wide spectrum and also spread out a very large geographical area broadband, so veracious ad-hoc networks [6] have to be existed between them. Here In this paper we proposed a type of Campus Area Network (CAN) through the usage of mobile devices or the concepts of mobile computing [7,8] and also defines that how mobile computing are more reliable to over other computing, which is generally used for networking and communications purposes. In this Campus Area Network various ad-hoc networks [5], which existed in a campus have to be connected with each other and makes form of a portable mobile computing networking architecture which also as much similar as the Computer Networking Model [9,10]. In this paper we also proposed a new mobile computing communication protocol, which is responsible to establish the connection between

or among the mobile devices, this protocol name are MCC (Mobile Communication Configuration). This protocol are responsible that how two or more devices have to connected with each other, this protocol also contains its own packet format and header format. Some of the upcoming sections defined the detailed mechanisms of MCC protocol header with each of their respective sizes and the mobile computing networking model. Mobile Computing are one of the most challenging and typical areas for today's technological era, because it's very complex and typical to make a mobile devices in those pattern which meet the overall requirements of today's computational devices [11, 14]. Because there are various aspects are presently existed in these area are that communication among the mobile devices through WI-FI [12, 13], so it's very typical for establishing communication through wireless media [15] over wired media [16]. There are various advantageous features to use the technology of mobile computation [17, 18] for performing any computational tasks [19] with very reliable and portable manner. But it's very typical to build up for all aspects, such as the main drawbacks of mobile computing [20] are security, because here in this mobile computing not an potential cyber security mechanisms [21, 22], which protects our data with full of confidentiality and integrity, because cyber intruder and Cyber Criminal are easy to access any mobile devices and threaten the security of mobile devices and steel some significant and important data. Wireless data communication [23] also adopts the mechanisms or forms of mobile computing to connect multiple mobile computing devices. These forms are as follows: Cellular Data Service uses technologies GSM, CDMA or GPRS [24]. 3G networks [25] such as W-CDMA [12], EDGE [15] or CDMA2000 and more recently 4G and 5G networks. This new Campus Area Network (CAN) also have to show that how wireless connectivity have to be established among all nodes with increasing graph of performance. Because In the previously traditional method to connect computers through LAN [18] are really a very complex, typical and expensive tasks, so using the concepts of mobile computing we will performed all these tasks with a very reliable and easiest manner and also increases the performance of the network over some other previously developed traditional networking model [19,20]. There are also a major concern or issues which occurring in the concepts of mobile computing such as Information Security related concerns, some hardware specification related concerns and some wireless connectivity[21] based communication concerns. But due to portability and ease of access and technology transformation push us to move the new advancement technological trend through the use of mobile computing. So the power of ad-hoc networks and its portability makes it better compare to other previously developed traditional networking model.

II. A NEWLY PROPOSED MODEL FOR MOBILE NETWORKING

The diagrammatic representation of this model are as follows:

Fig a: A CAN (Campus Area Network) using the concepts of Mobile Computing Architecture.
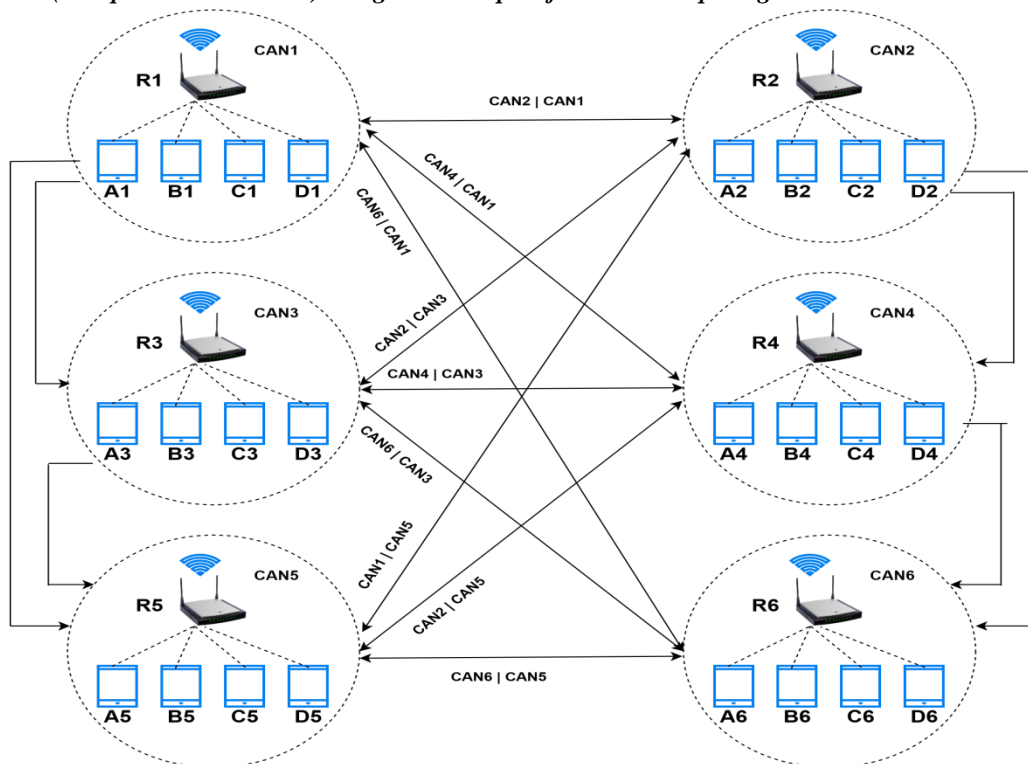
This newly proposed model is designed for a small campus area network such as a college or institutions or some small working organizations by using the fundamental concepts of mobile computing architecture. Because In this today's information age mobile computing play's a versatile and significant role to draw out a robust and powerful working computational machine for accomplished any tasks, but there are also some major barriers or issues which presently exited on this current trends of mobile computing architecture, but this newly proposed model are very powerful and contains a very rich technological aspects over the major barriers of mobile computing. In this model a convenient demonstration have to be displayed in the form of networking architecture model that how we connect various mobile devices in a robust and maintained computer networking architecture model using the concepts of mobile computing.

In this diagrammatic representation, a small topological structure have to be adopted. Various mobile devices have to be connected through a wireless router, because all mobile devices or handheld devices have to connect through the wireless mode, that's why we use the concept of the wireless router to connect them. In this first Campus Area Network (CAN 1), 4 mobile devices or handheld devices such as A1, B1, C1, D1 have to connected through the wireless router R1 and it's represent a one cluster. Similarly in these fashion various mobile devices or hand held devices have to be connect through the wireless routers and placed in a star topology like structure in the form of clusters. In this diagrammatic representation these all clusters are placed in a same building or different buildings as in the form of a CAN (Campus Area Network). These all clusters also connect with each other like a mesh topology or In other words all wireless routers have to be connect with each other like a mesh topological order. These all clusters using the naming conversion of CAN1, CAN2, CAN3, CAN4 ,….,CANN, based on the number of clusters are present in this networking model. In this model the communication system adopts a full duplex model to transform of information from one cluster node to another, here node represents mobile devices or some handheld devices. Here In the reference of intra-cluster domain if mobile device A1 wants to communicate with B1 then firstly the connecting configuration requests send to Router R1, which works on the wireless mode, then Router R1 set a virtual path to sends the packet to B1 which arrives on the Router R1 from A1. Here multiport Router have to be used to connect various mobile or handheld devices. In the inter-cluster domain when one cluster or CAN sends the packet to some another CAN, then similarly a node which wants to communicate to some other cluster node generates a connecting configuration requests, then it's request sends to their intra-cluster router then these intra-cluster router sends packet to some another cluster router then these router forwards the packet to desired node, Let's understand this with the help of an example, suppose if B5 wants to send data to B4, here B5 placed in cluster '5' and B4 placed in cluster '4' , then now firstly B5 generates a connection configuration requests and sends to intra-cluster domain router which is R5 then this router R5 sends this requests to inter-domain cluster router which is R4 in these references, then router R4 sends or forwards the packets to desired node which is B4. So this is the mechanism of this mobile computing based networking model. Here all routers works with wireless mode. Here multiport routers comes into existence.The packet structure of this newly mobile computing based Campus Area Network (CAN) are as follows:
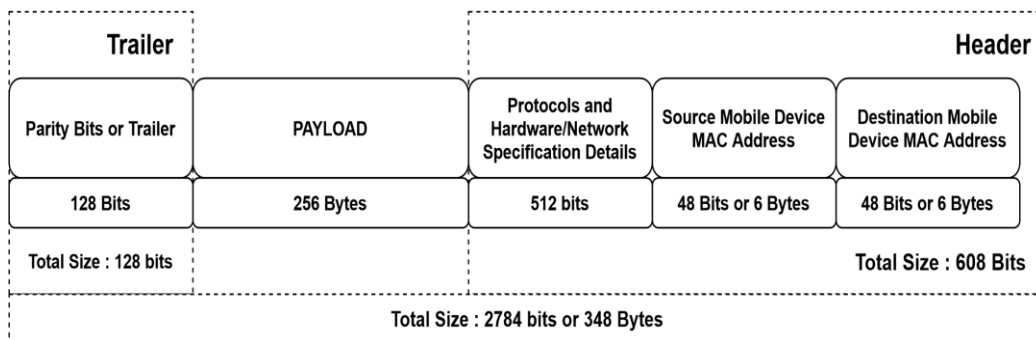
Trailer		Header		
Parity Bits or Trailer	PAYLOAD	Protocols and Hardware/Network Specification Details	Source Mobile Device MAC Address	Destination Mobile Device MAC Address
128 Bits	256 Bytes	512 bits	48 Bits or 6 Bytes	48 Bits or 6 Bytes
Total Size : 128 bits				Total Size : 608 Bits
Total Size : 2784 bits or 348 Bytes				

Fig b: Packet structure of intra-cluster CAN model based on mobile computing architecture.

This packet structure format are used to send data with in intra-cluster nodes such as the fig a diagram represents that In a Campus Area Network (CAN1) if node A1 wants to send data to B1 then it's adopt those type of packet structure. It's contains some significant field such as the first part contains destination MAC (Media Access Control address), it's contains a size of 48 bits or 6 bytes generally, it's a unique hardware address of any mobile or hand held devices, now the second field are source MAC address it's also contains a 48 bits of size, and now the third parts contains some hardware related specifications such as the IMEI number of mobile devices and some other hardware parts specifications of mobile or hand held devices and also contains some networking based details such as the bandwidth of network or the life of networks or some protocols details etc.

it's contains a size of 512 bits. Now the fourth parts contains payload or actual data which are transmit from source to destination, it's contains a size of 256 bytes or 2048 bits. Now the last part contains parity bits, it's contains a size of 128 bits, generally it's called a trailer. So this all packets fields contains a total size of 348 bytes or 2784 bits.
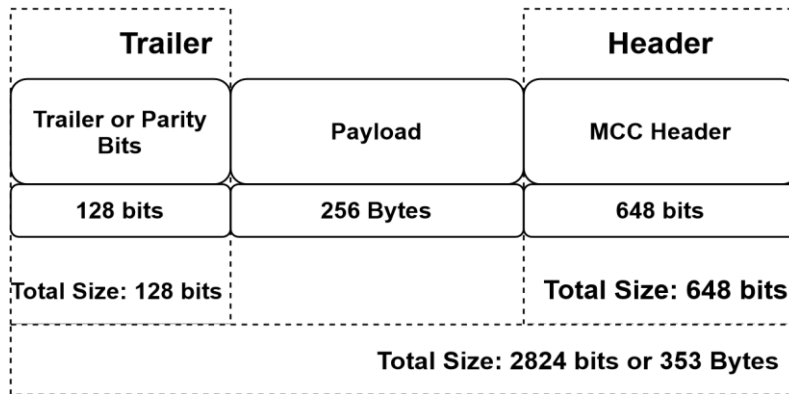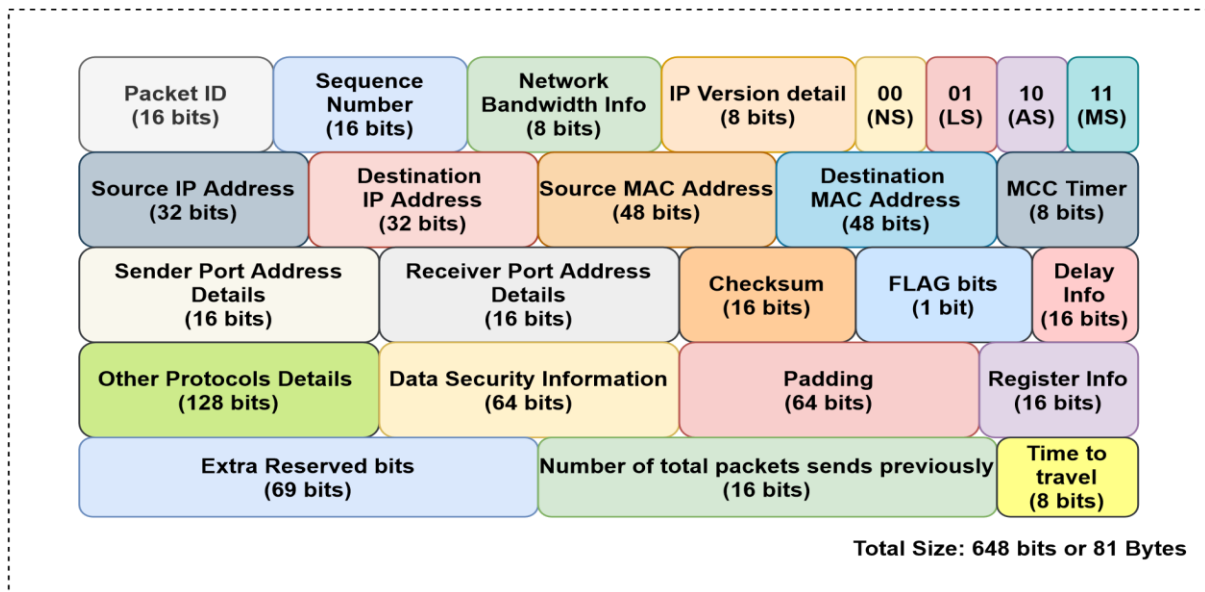

Fig c: Intra-cluster packet structure using MCC protocol header.

In this newly MCC protocol header contains a total size of 648 bits or 81 bytes. In this newly MCC protocol header contains all mandatory and significant fields related to communication perspective and networking perspective. Here MCC stands for Mobile Communication Configuration. The detailed structure of this newly MCC protocol header are

as follows:

Fig d: MCC protocol Structure.

It's the detailed mechanisms of a newly MCC (Mobile Communication Configuration) protocol header structure. It's contains all mandatory fields along with its consumable size related to communication or networking aspects. So this packet header contains a total size of 648 bits or 81 bytes, we append this header with the payload and trailer bits are added to the end of the packet and make a complete packet structure of this newly intra-cluster mobile computing based networking model.

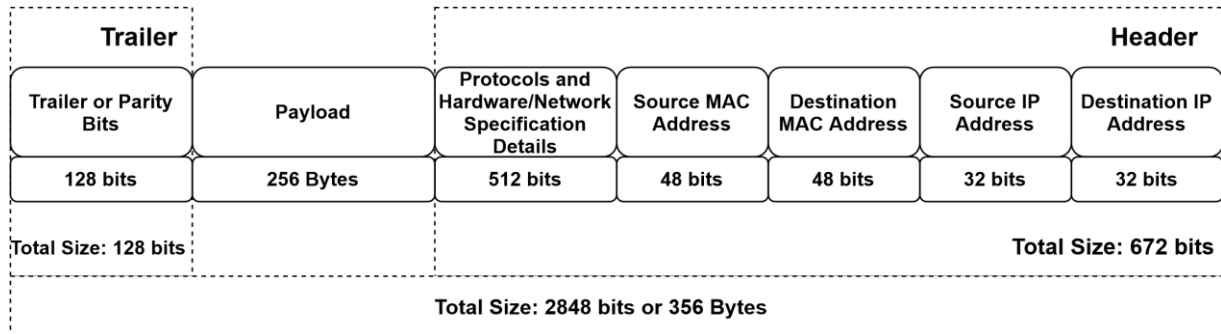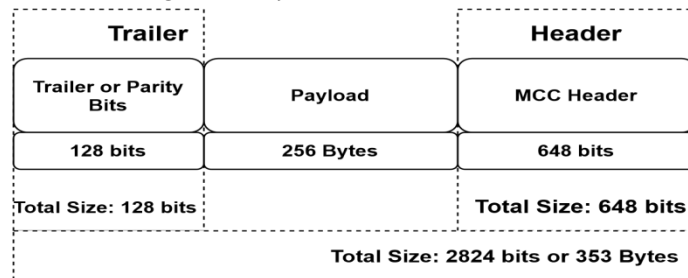The inter-cluster packet structure of this model are as follows:

Trailer		Header					
Trailer or Parity Bits	Payload	Protocols and Hardware/Network Specification Details	Source MAC Address	Destination MAC Address	Source IP Address	Destination IP Address
128 bits	256 Bytes	512 bits	48 bits	48 bits	32 bits	32 bits
Total Size: 128 bits						Total Size: 672 bits
		Total Size: 2848 bits or 356 Bytes				

Fig e: Packet Structure of inter-cluster CAN networks based on the concepts of mobile computing.

Here the detailed inter-cluster packet structure which adopts the CAN network to transmit packets from sender to the destination. In this packet some mandatory and significant fields are to be mentioned along with their size, such as the first field of this packet structure are called the destination IP address, it's contains a size of 32 bits when we used the Version 4 IP address, and the second parts contains the source IP address it's also contains a size of 32 bits. The third parts of this packet structure contains destination MAC address, which is physical address and contains the size of 48 bits or 6 bytes, and the fourth parts of this packet structure contains the size of source MAC address, which is also a size of 48 bits or 6 bytes. In the next fifth parts contains some protocols or hardware based related specification such as the bandwidth of the network or the capacity of the network link or the life of the network or some another details, which contains a size of 512 bits. The next sixth parts contains the size of 256 bytes or 2048 bits. And at the end we add on some parity bits or generally called the trailer have to append at the end of the packet and this trailer also contains the size of 128 bits. So this is the packet structure of inter-cluster domain of this mobile computing based computer networking model.

Here we also append a newly protocol which are appended on the first place of packet header.

This newly inter-cluster domain based packet structure are as same as the previously developed intra-cluster domain based networking model packet structure using the concepts of mobile computing.

Fig f: Inter-cluster packet structure using the newly MCC (Mobile Communication Configuration) protocol header

Trailer		Header
Trailer or Parity Bits	Payload	MCC Header
128 bits	256 Bytes	648 bits
Total Size: 128 bits		Total Size: 648 bits
	Total Size: 2824 bits or 353 Bytes	

using the concepts of mobile computing.

In this inter-cluster communication mechanisms following inter-cluster packet structure have to be adopted. In this model a newly protocol name says MCC (Mobile Communication Configuration) header are to be used. This MCC header contains the mandatory and significant information which are related to some communication and some networking aspects along with its size as mentioned in the figure d. The total size of this MCC packet header are 648 bits or 81 bytes and the total size of packet contains 2824 bits or 353 bytes. After append the MCC header which are of the size 648 bits, the next section of this packet structure are the payload which contains the size of 256 bytes. And at the end we append the trailer or parity bits, which contains the total size of 128 bits. So that's why the total number of bits which are used to transmit or received date from source to destination are 2824 bits or 353 bytes. So this protocol are used in the small Campus Area Network (CAN) or some small ad-hoc network structure. It's a very reliable and make a very robust connectivity with each devices and transmits and receive information with enormous speed.

So this is the overall model of this newly proposed Campus Area Network (CAN) based on the mechanisms of mobile computing and a newly MCC (Mobile Communication Configuration) protocol to transmits or received data from source to destination.

III. FUTURISTIC SCOPE AND ITS APPLICATIONS

Mobile Computing play's a versatile role in today's growing generation of information technology, because In the current scenario there are various advancements have to be done in the computational technology such as micro and macro devices comes into existence to enhance the power of computation with its portable size and reliable working mechanisms, but it's very complex to utilize the power of computation technology with these micro and macro devices. In the today's scenario we will make these all micro and macro devices such as mobile or other hand-held devices more powerful and technically or computationally strong such that it's gives as same throughput or performance which is equivalent to the traditional computational devices. But to manage or utilize the computation and processing power becomes a very typical and challenging tasks. Now the main concern is that how we manage or make a network of these all devices with the utilization of full of its potential and its capability. In this paper we proposed that how networking becomes possible among these all micro ad macro devices and also proposed a newly protocol for mobile computing name says MCC (Mobile Communication Configuration). There are various scope in these area of mobile computing, because networking play's a major role in today's information era where the information have to be travelled or passes from one geographic location to another, but these all information travelled with ease of suitability and also possible reliable data communication and transmission becomes a major significant and challenging issues for mobile computing in the near future. In this networking model we generally used a wireless router to connect various mobile or hand-held devices in a star topological manner where the wireless router plays a role of a hub, but In the near future we also do this using the concepts of cloud computing and other software enhanced mechanisms to decrease the computational cost and also achieves a high throughput and also designed a new AI and sensor based connecting devices and we also convert this model into some Artificial Intelligence based model and using the concepts of ANN (Artificial Neural Network) and CNN (Convolutional Neural Network), because these networking model spreads into some small geographic area such that all mobile or hand-held devices which wants to communication or the candidate for networking are existed within the range of 100 to 400 meters, because these networking model is designed for a small CAN (Campus Area Network) like a small building, institutions or some other small geographic locations. In this paper we also proposed a newly mobile computing based protocol which is MCC (Mobile Communication Configuration), In this protocol we defines a data packet header. These header contains some significant parameters or essential information regarding about the networking and communication framework of this mobile computing based networking model. In the near future we also modified or manipulate or optimize the size of the header and makes or established a reliable data communication framework among the networking nodes. In this paper we also defines a packet structure, which directly related to this model. Packet structure contains two different format, one format is that we send this packet to including the general header and the second format is that we avoid the general header and including the MCC (Mobile Communication Configuration) header. This packet structure also defines the header and the payload (the actual data which to transmits) and at the end a trailer have to be append. These trailer are generally the parity bits or some extra bits which are generally used for error detection and error recover mechanisms. So there are various advancements possible in the near future. This model also grow for a large or a broad spectrum. In the currently scenario these model have to designed for a small CAN (Campus Area Networks) or devices which are located in a small geographical area and exited in a minimum distance but In the near future we also grow up this model in a large broad spectrum. The main advantages of this model is that it's adopt a dynamic nature corresponding to the ever changing nature of technology. The major applications of this model are that some academic institutions, because In an institutions all students contains phone, that how these all students are connected in a very robust manner and how networking takes place among these all micro and macro devices are the major applications of this CAN (Campus Area Network) using the concepts of mobile computing. It's CAN (Campus Area Network) model works as a LAN (Local Area Networks) in the traditional computing environment. So if any micro and macro devices such as a mobile or some other hand-held devices are connected to each other, then we adopt this CAN model using the concepts of mobile computing or utilize the power of computation and processing capability of some other micro and macro devices. Some other applications of this model are such as an office or a small geographical area which situated within the range of 100 to 400 meters. So these are the futuristic scope and it's applications of this CAN (Campus Area Network) model using the mechanisms of mobile computing.

IV. CONCLUSION

In this Research we delivered a robust and appropriate mobile networking model which behave as a CAN (Campus Area Network) using the mechanisms of mobile computing architecture. Because In the today's information age the increasing growth rate of some micro and macro devices such as mobile or other hand held devices are in a very huge number with its increasing computational capability and low computation cost. So it's very mandatory and significant that how we utilize and bind these all devices in a robust networking architecture and increasing its throughput and optimize its computational cost. Because in today's scenario various micro and macro devices such as mobile or other

hand held devices gives the same throughput and performance as similar to the computing devices. Because these handheld devices contains a various number of advantages such as its ease of access and portability and as well as reliability. Because In the today's context how we connect these all hand held devices and makes computational tasks easier using mobile devices rather computer or some computing based devices are still a very challenging and typical tasks. So In this paper we proposed a robust mobile networking architecture model using the concepts of mobile computing architecture. Because these are also a much of utilities which connect one hand held devices to another such as the Bluetooth technology and WI-FI technology, but these technology connects a finite number of devices have to be connect and it's range also very minimum and data transfer also becomes very slow using these utilities. So here In this model we proposed the concepts of wireless Routers which provides as a WI-FI service to all mobile devices which belongs to one cluster and arranged them into a star topological manner to transfer information between sender to receiver. In this paper we also proposed a new mobile communication protocol such as MCC (Mobile Communication Configuration) which is generally used for to transmit data packets from sender to receive. In this paper the detailed information about MCC (Mobile Communication Configuration) header along with its size also be mentioned and also defines and provide the detailed description about the packet structure. This model is suitable for small CAN (Campus Area Network) or a small geographic spectrum, the reason behind that the range of wireless router are not covered a large broad spectrum and this is the min challenging issues for this model, but the futuristic scope of this model are outstanding and exploring a very new innovations in this model such as to overcome the wireless router range problem we also proposed the concept of Cloud Computing or some Artificial Intelligence based techniques to improvised these model in the near future. There are various advancements have to done in this model in the near future such as it's a prototype of mobile computing based networking model that how a robust mobile networking have to be established but various challenging areas in this model are that for security concerns some firewalls and proxy servers gateways have to be established in this mobile networking model and also these model contains some high costs for establishment, so to achieve a very minimum costs we replace these wireless routers by some software based specifications or software based utilities. So these model are perfectly suitable for academic institutions or those whose situated in some small geographic locations. So these are some applications of these model. Because In the current scenario of information ages mobile devices play's a very big role that all tasks which have to be done by computer are easily handled these micro and macro devices such as mobile or other hand held devices. So it's very significant that how we connect or to bind these devices in a robust and potential mobile networking architecture to utilize the all major and significant capabilities of these all mobile or handheld devices. So In this paper we proposed a CAN (Campus Area network) model using the mechanisms of mobile computing.

V. ACKNOWLEDGEMENT

VII.   CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

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