

Call and Messenger System without Internet using Mobile to Mobile Communication

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Abstract - GSM (Global System for Mobile communication) is a digital mobile network technology utilized globally to communicate with the mobile devices. GSM digitizes and compresses data, then sends it down a channel with two other streams of user data, each in its own time slot assigned using the Time Division Multiple Access (TDMA). Cellular communication is a form of communication technology that enables the use of mobile phones. The proposed method allows the devices to connect by applying the network reconfiguration which enabling nearby user equipment to directly communicate with each other bypassing the cellular base stations. Mobile to Mobile (M2M) communication is the key technologies that can help to solve the problems occur in cellular networks. M2M communication enables users to connect to nearest devices and interact with each other even during absence of a mobile network. The common element of all generations of cellular communication technologies is the use of defined radiofrequencies (RF), as well as frequency reuse. It enables the creation of wide communication networks by fully integrating the advanced capabilities of the mobile phone. Direct communications between devices can provide several benefits to users in various applications where the devices are in close proximity. And also enables the user to make the call and messaging system without network services and internet. This could allow large volumes of media or other data to be transferred from one device to another over short distances and using a direct connection. This form of device-to-device transfer would enable the data to be transferred without the need to run it via the cellular network itself, thereby avoiding problems with overloading the network.

Index Terms – Digital Mobile Network, Time Division Multiple Access, M2M Communication, Radio Frequency.

I. INTRODUCTION

Device-to-Device (D2D) communication in cellular networks is defined as direct communication between two mobile users without traversing the Base Station (BS) or core network. Such technologies help to maintain the necessary communication between user devices in case of natural disasters and traffic hotspot situations. In D2D communications, two or more user equipments directly communicate with each other with a very restricted involvement of the evolved Node B. Proximity doesn't only refer to physical distance, often referenced as signal strength received at mobile device (UE).

D2D communications are significant in applications like self driving cars, machine to machine communications and other internet of things applications. Traditional cellular networks are designed with tight coupling of control and data planes. The recent growth of data traffic, overwhelmingly brought a paradigm shift from voice-traffic to data-traffic. Cisco made observations at internet service providers and predicted that the annual global Internet traffic will rise to 1.4 petabyte by the year 2017, as compared to 528 Exabyte in 2012. This architecture conforms to the main objective of ubiquitous coverage and spectrally efficient voice-oriented homogeneous services. One of the contributors in this massive growth of Internet traffic is the proliferation of mobile devices and machine-to-machine communication.

Due to this growth, the capacity and coverage requirements exploded in recent years with a worldwide mobile traffic forecast of more than 127 EB in the year 2020. An increase of a thousand-fold in wireless traffic is expected in 2020 as compared to 2010 figures with an expected figure of 50 billion communication devices. The radio collector proliferation comprehensively talking adverts to an exchange trendy the significant way of the administration, non-in reverse thoughtful transmission framework building, and Modern wavebands. The finishing up less classes have found an exceptional development in the radio beneficiary industry, both as far as variable innovation and its endorsers. There has constituted an approve uprooting from kept to alterable evaluate telephony, especially since the change by inversion of the century. Aside the annihilation of 2010, there constituted more than four times more meandering multicellular memberships than kept communication lines. Both the portable mesh-work administrators and merchants have encountered the grandness of meshworks with an equally compelling plan. This resulted in meshwork readiness and improvement related administrations acquiring separating bearing.

II. SYSTEM DEVELOPMENT

SUPERIORITY:

Using D2D communication, a large amount of data can be transferred quickly between mobile devices in short range. It involves autonomous connectivity and communication among devices. A particular application is vehicle-to-vehicle (V2V) communication where D2D links can be utilized to share information between neighboring vehicles. Routing in D2Ds occurs at the network layer. The objective of routing in D2Ds is to find a path between the source and destination over which packets can be forwarded. Since the D2D is a mobile network and the topology of the D2D changes continuously, and due to the other considerations in a D2D environment, additional requirements are imposed on the Routing Algorithm. A D2D routing algorithm should not only find the shortest path between the source and destination, but it should also be adaptive, in terms of the changing state of the nodes, the changing load conditions of the network and the changing state of the environment. This is the reason, the majority of D2Ds are connectionless in nature, since connections are less effective in delivering the QoS that is

required in the rapidly changing D2D environment and impose additional overhead on the network. The D2Ds are also multi-hop in nature, in that packets need to be relayed through other nodes to get to the destination. Thus D2Ds require that traditional algorithms be redefined to accommodate these additional requirements.

COMPONENT PROVIDING UNIQUE ID AND DEVICE REGISTRATION:

The communication setup is initiated with the uniform identity provision to each user. For each user the login credential such as login name and password are maintained in the database. Once the user is registered, the unique identification number is provided to each user upon successful login process. The device validation is applied using the identifier verification based on the mobile number. During the registration process, the verification code is received in the message platform. The unique identifier is generated based on the IP address of the devices. This allows the device to connect with the non-duplicate entity in the local network connection.

III. PROPOSED METHODOLOGIES

RADIO INTERFACE RECONFIGURATION AND ESTABLISHING COMMUNICATION:

In order to establish the communication using the mobile to mobile communication methodology, the operating environment is reconfigured in the form of radio frequency reconfiguration. The communication can be the form of frequency based communication in the local proximity. This will allocate the uplink and downlink frequency similar to the cellular communication. By broadcasting the proximity beacon message, the available devices are identified and connected with the configured device in the communication region.

DATA TRANSMISSION REQUEST AND ROUTING PROCESS:

The connection between two or more devices is established using the ad-hoc communication model. Ad-hoc is a communication mode that allows devices to directly communicate with each other. If the sender and

the receiver both present in the neighborhood range, then the communication is established directly. If not present in communication range, then the devices establish the multihop route using the route discovery process.

ROUTE DISCOVERY PROCESS:

The source node performs the route discovery process by sending the route request message to destination as a network wide broadcast message. This message is broadcasted over the wireless medium and it is received by the neighbor nodes. The neighbor node validates the route request message for routing loop and freshness of the control message. The receiver node creates the reverse route entry to reach the source node with the corresponding seqno of the request message. After the successful completion of route request validation, receiver nodes match the destination node id with the current node id. If the match is not found, route request message is rebroadcasted over the medium until packet reaches the intended destination. Once the packet reaches the destination node, it constructs the route reply message with the exact reverse path of the request message. Reply message is originated by the destination node and unicasted to the corresponding forwarder nodes to reach the source node of the request message.

DATA ENCODING, DATA TRANSMISSION AND DATA RETRIEVAL:

Upon completion of successful route formation, the data transmission is initiated using the established multihop route. The user interface for the transmitter and the receiver both are connected at the application layer level. During the data transmission the data is encoded and transmitted using the wireless medium. The intermediate forwarder devices, relays the packet to the intended destination using the established path. Once the data is received by the destination, then the text message and audio content is transmitted in the application level.

IV. SYSTEM IMPLEMENTATION

The radio network consists of a large number of BTSs. Each BTS is given an identity. These BTSs are grouped according to location area, also given an identity. Each MSC/VLR (Mobile Services Switching Center/Visitor

Location Register) serves the BTSs in an number of location areas. The GSM phones reports to the network (VLR) when it moves from a BTS in one Location Area to a BTS in another location area. The VLR always knows in which location area the GSM subscriber is located in at any given moment. Accordingly, the HLR always knows which MSC/VLR the GSM subscriber is at as well. Then, the GSM subscriber's telephone number tells the network which HLR the actual GSM subscriber belongs to.

V. CONCLUSION

Device to device communication is an advanced data transmission technology developed to increase the efficiency of network. In D2D communications, two or more user equipments directly communicate with each other with a very restricted involvement of the evolved node. Direct communications between devices can provide several benefits to users in various applications where the devices are in close proximity. Such technologies help to maintain the necessary communication between user devices in case of natural disasters and traffic hotspot situations. D2D communication, enabling nearby user equipment (UEs) to directly communicate with each other bypassing the cellular base stations, holds great promise for extending cellular coverage in the case of a network infrastructure failure or a natural disaster.

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