



## A Survey on Architecture of Multimedia Communication over MANET using SIP Client Application

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**Abstract:** *A mobile ad hoc network (MANET) is a group of mobile nodes vigorously forming a short-term network using the without any existing network infrastructure and centralized, because MANET is a decentralized or self-configuration network of mobile router and it is connected by the wireless link without any access point. The routing is the foremost problem to route and direction the message from one source node to another destination network in MANET. In thesis I present the multiple communications using the architecture of SIP protocol on MANET. SIP (Session Initiation Protocol) protocol is a protocol for signalling and real-time-media communication and then it is a message format i.e. it is similar to HTTP like an application layer control signalling protocol produced with the resolution of establishing and terminating voice, audio and the multimedia communication. SIP has been standardized within the IETE in the framework of multimedia conferences and VoIP services and it is support the real-time and multimedia communication, mobility and the peer-to-peer type communication. SIP MANET is based on the projected architecture and the audio/video or multimedia communication and the particular operation has been confirmed.*

**Keyword:** *MANET (mobile ad hoc network); SIP (session initial protocol); Routing Protocol, VoIP*

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### I. INTRODUCTION

MANET (mobile ad hoc network) is a decentralized networking and it has no centre point or access point. It is a wireless network and the communication-less system of transportable router is connected by the wireless link without any access point. Ad hoc is the Latin word and the meaning of this word is "for this resolution". Through wireless communication network group of one /more method is prepared in ad hoc network [5].

A routing protocol is the foremost problem to route and direction the message from one source node to another destination network in MANET. We used some routing algorithm in MNAET for designing the MNAET. Proactive and reactive routing protocol, both are classification of routing protocol and in MANET both are used for information of routing protocol is updating and discovering the route. The example of proactive and reactive routing protocol widely use in MNAET naming AODV and DSR. In MANET, the sharing the medium wireless and the network topology and it can modification the unequally and vigorously. The damage the sending and receiving message link or connections are normal in MNAET and route are freely moving to anyplace and they are organized themselves randomly [7].

The routing protocol is used to determine the correct path data transmitted. MANET is a group of free mobile components that can be communicated to the other wireless connection like that, lab top, and smart phone, table PC etc. And they are co-operative the capable and accurate packet routing between the nodes. No specific routers, servers, and access point or central point for MANET. In routing protocol, there are two types of routing protocol namely, Unicast routing protocol, in computer networking, unicast transmission is identified the unique address and is to sending the data packet to a single network destination.

In MNAET the maximum applications is based on the unicast communication, so, in IP layer the maximum process of MNAET is successfully the files pack is sending source to destination node. Unicast Routing protocol be presented into the reactive, proactive and hybrid routing protocol.

Another type is Multicast Routing Protocol, the process of Delivery the some information to a group of destination Routing Protocol called the Multicast Routing Protocol. Even though, the multicast transmission is not widely deployed in the current MANET, and it will develop very important in multimedia communications. When we sending the several duplicates of mails toward activity the characteristic broadcast environment of wireless- transmission we can use the multicast routing protocol to recover the productivity of the infrastructure connection. The broadcast transmission consumes considerable the bandwidth and power it should be escaped.

Proactive routing protocol, it means that the routes are available immediately in network. In the net-system the Table-Driven Routing protocol, is to retain the informed direction-finding info starting all nodules to another nodule and one/more counters on the way to collection the direction-finding info it required now this protocol [2]

The advantages of this protocol are

- The route path is immediately available
- Route is starting from every nodules to every node to happening the net-system

- Route are ready toward the immediately
- A large direction finding residence

Disadvantages of proactive routing protocol are

- Maintenance for the respective amount of data
- In the restructuring and failure perform the slow reaction
- Increase the amount of topology information and this information is stored at each node then it avoids the loops and speedup protocol convergence
- The size of route and update frequency is dynamically verified

Reactive Routing Protocol, if there is no communication, the reactive routing protocol does not maintain the routing information and the routing activity in the network node. The responsive direction-finding approach likewise termed on-demand direction-finding procedure. If we want to send a node or a package into other nodule and formerly after that, these procedures is examinations designed for the direction into responsive method and then found the packet is sending or not and also found the received or not the packet. Before the data transmission we calculate a path of data packet in on-demand routing protocol. When we data transmitted, the data traffic is not produced by the node and then after that the routing activity is totally absent [2].

Procedures of reactive routing protocol

- Path discovery: The path discovery procedure of reactive routing protocol is constructed on a query cycle that accepted the swamping of queries.
- Path maintenance: In on-demand routing protocol, when there is no path for the data transmission of sending a message to the destination, the path discovery is triggered asynchronously.
- Path deletion: In maintenance procedure unit the routing information maintained.

SIP protocol is a text based code of behaviour with a message format i.e. it is similar to HTTP like an application layer control signalling protocol created with the purpose of establishing and terminating voice, audio and several media period. In

MANET the user transfer a request to another user and connection established after the user accepts an answer from another user. SIP server is essential to translate the IP-address and Port-number and to write again the SIP, Session Initial Protocol, message [3].

In SIP architecture, SIP has two main components, user agent and SIP server. They are,

1. User Agent (UA)
2. SIP server

SIP UA includes the two elements namely, User Agent Client (UAC) and User Agent Server (UAS). User Agent, UA is an entity, which send the SIP request message and receives the answer to those the request. In SIP network all UA work through an administrator and the administrator protects the info of registration in Local-Server (LS). The local server is a co-location through an administrator, and then keeps up the user places in specific insistent collection. SIP UA uploaded the call-handling preferences and it can be useful to the resultant call designed to the UA [1][9].

SIP Server, We have two kind of SIP Server, namely the PROXY SERVER (PS) and REGISTRAR SERVER (RS). If UA send a request communication to the PS and then the PS is similar to HTTP proxy and it resend the request message into the receiver. It is an intermediate routing node in between the sender and receiver. The registrar server, if we going to communicate the server before communicate with other user agent the SIP user agent must be register with the registrar. SIP request uses SIP URL, e.g. sip: Shia Jain@ pun.com, this is the Address of Record (AOR) is to identify the endpoint of the invited places [1][9].

We explain the six types of SIP methods in the following:

REQUEST: In UA to perform the registration procedure we can use the REQUEST method. The UAC builds a REGISTER demand application, and consist of the subsequent information:

1. As a SIP URI, we can registered, e.g. sip:shia@jain.com.
2. As a SIP URI (e.g. sip: shia.@jain.com).
3. If the demand application is success, the registrars will arrival a response with a code of response number 200.

INVITE: If we want to create a mass media among the UA we can use INVITE method.

ACK: The reliable message exchange is confirmed in ACK method. From the INVITE method, the client has been received a final response.

CANCEL: The pending request is terminated in this method, but do not affect a completed invitation. BYE: It is used by terminating the session between two users.

OPTIONS: demanded a server in OPTION request method and it is permits a UA to demand a server about its experiences.

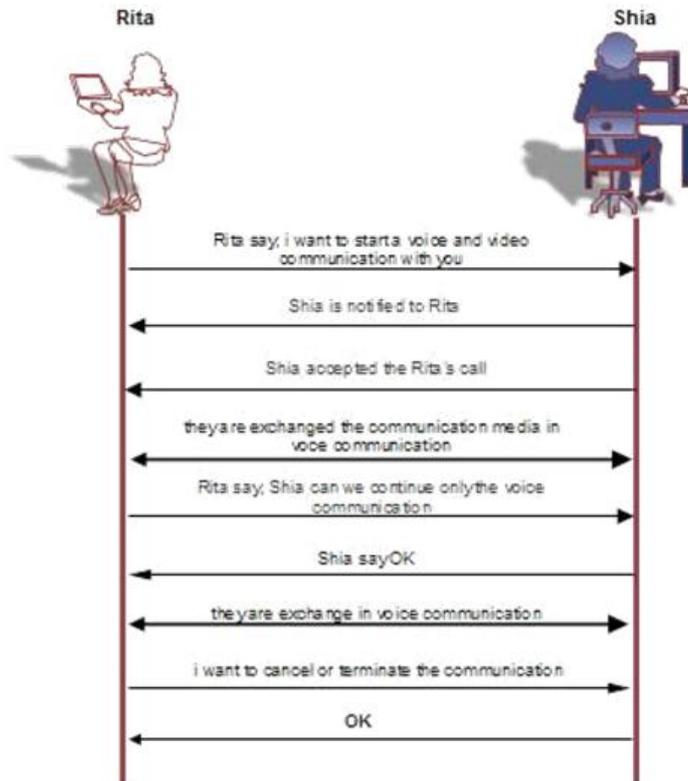


Fig 1: voice and video communication using SIP protocol method through a wireless network

When we after received a message and getting the request message, we can get that messages with SIP response messages, call SIP response method and it is indicating the status, success and another thing is failure. The response code is represented by a three number. The 1<sup>st</sup> number is defined the period of the reply message and another reply message doesn't have any classification roles.

In response method have six classification, they are:

1. Provisional (1xx): Request received and being processed but it not yet complete.
2. Successful (2xx): The achievement is successfully accept, we agreed, and recognized and request is completed successfully.
3. Re-direction (3xx): Additional achievement wants to be used to total the invitation and then try to the request at another location.
4. Client-unsuccessful: (4xx): The invitation covers the evil arrangement or cannot be satisfied at the user, i.e. request isn't finished for the reason that an unsuccessful in the invitation and retry after correction.
5. Server-unsuccessful: (5xx): if the server is unsuccessful to satisfy, actually effective invitation and invitation isn't finished for the reason that an unsuccessful in the receiver, it repeated the invitation to the other position.
6. Universal-Failure (6xx): The invitation cannot be fulfilled at any server and if request is failed they do not retry again and again [3].

In MANET SIP, Session Initial Protocol is used designed for video or audio (hypermedia) communication. SIP, Session Initial Protocol is a communications procedure used designed for communicating between different devices on a network, whether on the LAN, the WAN, or across the internet. P2P SIP addresses this problem by using distributed implementation based on a P2P paradigm. Both traditional SIP and P2P SIP architectures are not suitable for MANET because they are initially designed for infrastructure network. SIP works on highest more than a few diverse transportation procedures. SIP, Session Initiation Protocol is a indicating procedure for used real-time media message and is widely used for establishing multimedia session [6].

Voice over internet protocol (VOIP) is a method and individual of tools for sending the vocal sound infrastructures and hypermedia periods is completed the Internet Protocol (IP) linkage, like the internet. And another position of VOIP is IP-telephony, Internet-Telephony, Broadband-Telephony, and Broadband-Phone package [5]. Then the word Internet-Telephony is exactly refer to the responding of the infrastructures service, like, vocal sound, document, and vocal sound messages and somewhat the community switch phone set-up. Session initial procedure is an indicating procedure designed for monitoring the hypermedia communications periods in the voice and audio part. And P2P VOIP solution is provided a substructure somewhere message concerning the events involved doesn't permit over a 3<sup>rd</sup> event after sound arrangement and then formerly the sound is established, the request movement among the superior class openly as devoid of a centralized user in the SIP. It is a method to design to the effort in a distributed user location designed for the well submission distributed sharing [4].

SIP is a request procedure that can create, change, and dismiss hypermedia periods like internet requests. SIP can also call members to previously standing periods like multicast sessions. Broadcasting is available (and removed from) a

current period. SIP clearly maintains plotting and forwarding service station, it maintains individual movement user and it keeps up only outside evident irrespective of the link situation [5].

Wireless network, Meaning of wireless is "having no wireless". Using the wireless network, we described between sender and receiver where there is no physical wire connection in computer network and the network is connected by the radio waves and microwaves to maintain the communications [2]. The radio wave is used to in wireless network to connecting the devices like laptops to the internet, the business network and application. If we when laptop are connected to the Wi-Fi shooting advertisements in public places, and in the business's wireless network connection is established. There are two types of wireless network, and they are:

- Infrastructure
- Ad Hoc Network

Infrastructure Network, in infrastructure has the central point or access point and that connect to the all devices. An access point (AP) is represented a central point for all nodes and any node can be joint to the network through this access point. Maintaining the routing table is a big upstairs in using the infrastructure network, this is the main drawback of infrastructure network. In infrastructure network, the Wi-Fi network function is to communicate all devices through a single access, generally, which is the wireless router. The access point organized the connection between the Basic Set Services (BSS) [2].

Ad hoc Network, the Ad-hoc-network is a kind of decentralized network. If we want to setup two PC in ad-hoc-network, they are connect directly to each other without a centralized access point and this set-up is called independent basic service set (IBSS) stations. Then IBSS communication not used centralized access point. Ad hoc network are self-organized network and all nodes are freely moved randomly. All nodes are connecting by other node and devoid of any connection less network in Ad Hoc Network. Mainly, the Ad Hoc Network is used for the some situations where the any wireless infrastructure is inaccessible [2].

## II. LITERATURE REVIEW

Li Li and Louise Lamont et al. (2005), here present, in MANET multimedia real-time session (voice and audio communication) service is highly required. In this paper present in MANET, the network architecture is examined and their presentation status is calculated designed for the multimedia conference centered service using the SIP protocol. SIP protocol is projected by the Internet Engineering Task Force (IETF). To achieve improved system and protocol efficiency, the service discovery mechanism is applied the bad-tempered level project among the direction-finding level or request [10].

Yacine Rebahi, Dorgham Sisalem et al. (2008), here present, in ad hoc network how to draw the SIP based multimedia service. This method is complete in two main outcomes they are: the lack of current infrastructure is killed. And another one is to protect the undertaken communication privacy network with a robust security mechanism. SIP protocol is designed in a fixed network when the SIP proxy server is available in communication time [9].

Tien Pham Van et al. (2010), in this paper, discuss how to design and implement for controlling multimedia sessions in MANET. Taking into the node mobility account, route uncertainty and start a distributed multimedia application done in MANET and service oriented design. The routing information message can be broken to convey user identity data. All nodes are conserves the compound routing table and covers the route and address of peer. For multimedia session control have two protocols namely SIP protocol and H323, both are used for session management. H323 is binary based protocol while SIP protocol is text based [8].

Marcel C. Castro et al. (2008), here, MANET is flexible, self-configuration and decentralized network. MNAET is provided the multimedia communication services like VoIP environment, maintenance the session initial protocol (SIP) and it is important. In this paper study the implication of MANET in internet connected and analyzed the drawback of SIP server scalability using the architecture of SIP [5].

Toshiaki et al. (2011), here, mobile ad hoc network be located a group of movable nodules vigorously creating a short-term link using without several current link substructure and central, because mobile ad hoc network be located a decentralized or Self-configuration link of movable direction-finding & it is associated by the connection-less link without any access point. SIP protocol is a procedure designed for signing and real-time-media announcement and then it is a message format i.e. it is similar to HTTP like an application layer control signalling protocol produced with the resolution of establishing and terminating voice, audio and the multimedia communication. In this paper suggests architecture of mobile ad hoc network then resident several paths direction-finding designed for SIP facilities. The accurate the process VoIP request SIP can be established and SIP MANET Emulator in this paper [4].

Hiroyuki TODOROKI et al. (2012) here, offerings the MANET emulator structure, an appropriate designed for authenticating SIP facilities through MANET, and then the SIP is constructed the auditory/videotape message. In this research paper discuss the photograph switch of SIP protocol then abilities devoted to dispensation mails then the packs are also define into the session protocol and AODV. The right process of auditory or videotape message is established and developed SIP MANET emulator based on the proposed architecture [6].

Heng-Te Chu et al. (2012) here, in distributing the SIP waiter purposes into MANETs, and they are put away the vary influence or bandwidth, and proceeds the link-topology randomly and it is changed to a little consideration. The AODV direction-finding is also uses a responsive approach and to conserved the source depletion. And then in this paper present, In MNAET a middleware is incorporate with AODV in directly to minimize the signalling enable SIP-based application [7].

### III. PROBLEM DEFINITION

In MANET, definitely not have central network i.e. not have access point but SIP protocol is the centralized network. So the common process for the determining SIP URI required or binding data is uncontrollable and is the direction-finding procedure for SIP e-mails or proxy server. SIP message ID is created a category of Uniform Resource Identifier (URI) is known as SIP URI, equivalent to e-mail ID. The dedicated router is not available in MANET. That is why; each all nodes must be act as a router for helping the other forwarding message. Proactive, the routing info of all mobile nodes is update continuously and it may be generated considered overhead that control the network presentation and another one is Reactive routing approach; it is discovers only the router on request base, for example the AODV routing protocol.

The proactive routing protocol is faster than the reactive routing protocol as bandwidth and battery power are the primary concerns in wireless network so, reactive routing protocol is a best routing approach in SIP\_MANET.

### IV. CONCLUSION

In this research work, I present the how to communicate multimedia (voice and audio) communication using the SIP (signalling initial protocol) protocol on MANET. MANET (mobile ad hoc network) is a decentralized networking and it has no centre point or access point. It is a wireless network and the communication-less system of transportable router is connected by the wireless link without any access point. Ad hoc is the Latin word and the meaning of this word is "for this purpose". Through wireless communication network group of one /more method is prepared in ad hoc network. We present the multiple communications using the SIP architecture on MANET. The SIP protocol is a text message and it is created with the purpose of establishing, modifying, and terminating voice, video, and multimedia communication network and then, the main problem of SIP protocol is using in MNAET is, SIP network is the centralized networking and MANET is the decentralized networking. So, the common process for determining SIP URI required material is unmanageable.

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