CHAPTER 2

LITERATURE SURVEY

2.1 INTRODUCTION

A review on the manageable literature highlights that distinctive approaches have been engaged to solve the troubles of Gateway Discovery Schemes, since the time when routing algorithms for Mobile Ad Hoc Networks were dynamic and difficult in real time situation. The literature survey of this research work has been undertaken to focus on the following sections.

1. Optimizations of Gateway Discovery Process in MANETs.
2. The Gateway Selection for Hybrid MANETs.
5. Extension of Gateway forwarding strategies used for MANET.
6. Adaptive Gateway Discovery in Hybrid MANETs.
7. Multicast transmission.
2.2 OPTIMIZATIONS OF GATEWAY DISCOVERY PROCESS IN MANETS.

Hamidian et al. (2003) described an approach which provides Internet connectivity to mobile networks by changing the AODV routing protocol. ‘I’ flag is extra as an expansion to AODV, route request and route replying to locate the specific node. If following one network-wide seeks without receiving any related route replies, the mobile node believes that the destination is a set node, which is placed in the Internet and thus delivers the packets all over a gateway. Md. Asif Iqbal et al. (2011) state the hybrid gateway discovery scheme for gateway discovery. When mobile node does not discover a route to a gateway in its routing table, it starts a gateway discovery process by broadcasting a gateway discovery message in the MANET. While broadcasting the message, the requesting mobile node sets an early Time To Live (TTL) value for the message and begins a timer to wait for the response of the gateway advertisement message from the gateways.

Hossam El-Moshirify et al. (2007) offered a solution in which mobile nodes can access the Internet via a set gateway node or access point. The impact of the mobile terminal's speed and the number of gateways on the network performance are compared in this approach. In this proposal, the mobile node uses no load balancing approach to an efficient discovery on the Internet gateway.

Matthias Rosenschon (2005) described the connecting ad-hoc networks to the Internet via gateways. To begin the Internet connection, the first initiative is the gateway discovered by the mobile nodes inside the ad-hoc cluster, gateway discovery based on HELLO packets of the AODV protocol. The act of the innovative algorithm expressions in the discovery time and the handover delay is compared to using NS-2 simulations.
L. Lamont (2003) designed network architecture, the mobiles connected as an MANET; use the Optimized Link State Routing (OLSR) protocol for routing inside the MANET. Mobility management across WLANs and MANETs is attaining during Mobile IPv6 (MIPv6). A real test-bed has been built to show the possibility of the proposed approach. A result in Efficiency of handoff between WLANs and MANETs has been measured in terms of delay and packet loss. Haseeb Zafar (2012) discussed the QoS-aware Shortest Multipath Source (Q-SMS), basically change the previous proposed SMS scheme to explicitly provide QoS assurance. The new scheme allows nodes to find and then use evaluation of the residual capacity to make suitable admission control decisions.

Perumal Sambasivam (2004) focused on decreasing the number of route discoveries, existing approaches to multipath routing to make use of pre-computed routes determined during route discovery. These solutions still exist in high mobility because the alternating paths are not enthusiastically retained. Hence, especially when needed, the routes are often broken. To overcome this problem, a new adaptive multipath resolution has been initiated. In this approach, multiple paths are created in the route discovery process. All the paths are sustained by broken up rework of unicast packet along each path. These revised packets compute the signal strength of each hop beside the alternating paths.

2.3 GATEWAY SELECTION FOR HYBRID MANETS.

Quan Le-Trung (2009) discussed the hybrid metric for the load-balance of intranet/internet-MANET traffic over multiple Internet gateways and made use of both mathematical analyses and simulations to discover the required functional and other problems, provided that Internet connectivity and mobility management for MANETs where available. The proposed hybrid
metrics for gateway selection is the alternative of the shortest hop-count metric and presupposes three aspects: hop count distance, Intranet-MANET traffic, and Internet-MANET traffic.

Robert Brannstrom et al. (2006) proposed a proactive gateway discovery scheme that is used to link multi hop ad-hoc networks with the Internet. This reduces the delay in the gateway discovery process and the advertisements might arrive to a mobile host through various paths, wherein it is vital to maintain track of the most excellent path to all gateways. Here the Running Variance Metric (RVM) and Relative Network Loads (RNL) are used as performance metrics to categorize the traffic load of gateways in MANET access networks.

Safdar Hussain Bouk et al. (2012) proposed a gateway discovery scheme in which movement of each node is considered as an order of random length intervals called epochs during which a node moves in a direction $\theta$ at a constant speed $v$. In this place the connection accessibility time between two nodes alters at dissimilar time intervals and the path accessibility period between two nodes that are not direct neighbors of each other, is equal to the least link accessibility time between midway nodes in that path.

Khaleel Ur Rahman Khan et al. (2008) focused on the performance of the conservative DSDV algorithm because of an increase in the network size and mobility. This algorithm improves various performance metrics of the DSDV protocol such as PDR, end-to-end delay and the number of crashed packets. When a next hop link from the source to the destination breaks, the proposed protocol generates a temporary link during which neighbor has a valid route to the required destination.
Yogesh Chaba et al. (2012) discussed a gateway selection for using hybrid MANETS. An extension of multipath is useful, for if one of the paths do not succeed the data can be routed through a new path. First is request; the source node broadcasts a route request packet to its neighbours until it reaches for the destination node. Second is reply phase, the route reply is sent to the source by the destination. This way the route cut-off problem is solved.

Wakikawa et al. (2006) proposed a proactive protocol in which the gateways at regular periods flood the network with control messages named as GW_ADV and these messages are being forwarded, ad hoc nodes to make reverse routes to the gateway. In this fashion, when a node wants to communicate with nodes in the Internet, it uses the route to the gateway to send the traffic addressed to nodes in the predetermined network. Robert Brännström (2005) discussed the proactive approach to keep away from the interruption of the route discovery process. Mobile IP is frequently suggested to handle macro mobility, and use the advertisements regularly sent by the gateway to rework routing tables in the ad hoc network. Since advertisements might lengthen to a mobile host during multiple paths, it is essential to keep track of the best path to each gateway.

Felix Hoffmann et al. (2009) described the problem of choosing the best Internet gateway as a mixed integer linear program reduce the highest node use in the wireless network. By simulations, it has been found that the performance that can be accomplished by solving this optimization problem is much higher than what is achieved by standard gateway selection algorithms based on hop count or gateway load.

Rakesh Kumar (2011) discussed an overhead mechanism moving the overall performance of this integration which is the discovery and selection
of Internet gateways as discovery time and give up delay have well-built control on packet delay and throughput. Using NS2 network simulator, the node mobility for two different cases has been examined in conditions of performance metrics throughput; end-to-end-delay and routing overhead where the three gateway discovery approaches have been employed.

2.4 DIFFERENT CONCEPT OF GATEWAY DISCOVERY ROUTING PROTOCOLS.

A variety of Gateway discovery routing protocol concepts are required to implement the proposed algorithms in all ways. The following literature survey is supportive for developing a new routing mechanism for Mobile Ad Hoc Networks.

Ammari et al. (2004) proposed a mobile gateway based on three-layer approach using both Mobile IP protocol and DSDV Ad Hoc routing protocol. The first one is Mobile IP foreign agents; the second is mobile gateways and mobile Internet nodes, which are one-hop away from Mobile IP foreign agents; the third has all MANET nodes and visiting mobile Internet nodes that are at least one hop away from mobile gateways.

Jonsson et al. (2000) proposed a system; the hosts that do not want to access the Internet see the ad hoc network as a standalone network. The tunnelling approach also enables MIPMANET to include the default route concept into on demand routing. The AODV routing protocol is used within the mobile ad hoc network and delivers packets between mobile nodes and foreign agents. MIPMANET permits a calling node to switch from its current foreign agent to a new one, a fact known as handoff, only if it is at least two hops closer to the new one. It uses a new algorithm, named MIPMANET Cell
Switching (MMCS), to conclude when mobile nodes in the ad hoc network should register with a new foreign agent.

Wakikawa et al. (2006) proposed an approach to global Internet connectivity over the IPv6 MANET environment, where mobile nodes in the Ad Hoc network are configured with new globally routable IP addresses based on the Neighbor Discovery Protocol (NDP) of IPv6. The gateway advertisement message contains the global IPv6 address of the gateway, the network prefix advertised by the gateway, the prefix length and the lifetime associated with this information. They identify a stateless auto-configuration mechanism, which is based on network prefixes advertised by Internet gateways. The nodes concatenate an interface identifier to one of those prefixes in order to generate the IP address.

Lee et al. (2003) proposed a hybrid gateway discovery protocol that requires a source routing protocol in the Ad Hoc network. A gateway sends out new advertisements only once it discovers any topology change in the ad hoc network. In addition, advertisements are only forwarded to nodes that are either connected to the Internet or that have truly moved. Advertisements are only generated if the ratio between the number of the Internet joining nodes, and the number of advertisement forwarding nodes exceeds a threshold.

Lin Zhuang et al. (2009) proposed a hybrid gateway discovery approach. To avoid unidirectional links and to relieve broadcast storm, Shen improves the original hybrid gateway discovery scheme by extending AODV hello messages with local connectivity information. Each MN maintains a Neighbour Node List (NNL) to record its set of neighbours (i.e., all nodes from which it can hear hello message) and it then appends this set in its coming HELLOs. When a node receives a hello message from a neighbour, it
will add it into its NNL, and if it is not present in the neighbours set in this hello message, the node can conclude that it is the sink of a unidirectional link between them and marks this neighbour as the asymmetric neighbours in NNL.

Khaleel Ur Rahman Khan et al. (2008) proposed a protocol in which each mobile host preserves a routing table that stores the number of hops, and the sequence number for all the destinations. The routing table revises may be time driven or event-driven. The interval between the two updates is known as the periodic route update interval. When an intermediary link from the host say S to the destination say D breaks. The efficient DSDV protocol makes a provisional link during a neighbour, which has a valid route to the required destination. The provisional link is making by sending one hop route request and routes acknowledge messages.

Rosenschon et al. (2005) proposed a proactive gateway discovery scheme which makes use of hello messages to connect the MANET node to the Internet. The ad-hoc routing protocol such as AODV use's HELLO messages for neighborhood management. The gateway sends two types of packets periodically, which are advertisements and HELLO messages. Here, each node sends HELLO messages from time to time with a time to live (TTL) of 1. The idea behind this gateway discovery algorithm is that if a gateway uses HELLO packets for neighborhood discovery, it does not need to send advertisements with a TTL of one additional to the HELLO messages. The advertisements can then be neglected, and they may be substituted by special HELLO messages. Therefore, a flag has been introduced to indicate that a special HELLO message was initiated by a gateway node and not a normal node.
Harpreet Kaur Sandhu and Roopali Garg (2012) proposed modified Ad-hoc On Demand routing protocol (AODV) called AODV + to integrate MANET with the Internet using a stationary gateway. Suitable to the dynamic nature of MANET, the changes in topology are very frequent and the task of routing the data turns out to be a challenging. The performance of AODV+ and Destination-Sequenced Distance Vector (DSDV) has been evaluated by simulating them in the wired cum wireless scenario and their performance have been compared with three metrics like as packet delivery ratio, average end-to-end delay and average throughput. Safdar Hussain Bouk (2012) described a method to obtain the overall network performance, the claims it is compulsory to select a gateway with a stable path, a path with the highest residual load capacity and the least latency. In this gateway selection, the scheme believes multiple QoS path parameters such as path availability period, available capacity and latency, to select a possible gateway node to better the path accessibility calculation correctness, and to initiate a feedback system to simplify path dynamics to the traffic source node.

Laxmi Shrivastava et al. (2011) carried out a survey on Congestion Adaptive Routing Protocols for Ad-Hoc Networks, especially in large-scale transmission; routing protocols, which are adaptive to the congestion status of MANETs, could greatly improve the network performance. Jahir et al. (2009) organized the Multipath hybrid Ad Hoc Networks for avionics applications in disaster area, and they proposed the Ad hoc On-demand Distance Vector Hybrid (AODVH) and it has been compared with other ad hoc networks routing protocols. It was found that AODVH performs better in terms of packet loss, average delay and throughput. James R Yee (2005) has suggested the optimal Internet Enhanced Interior gateway Routing Protocol (EIGRP). Jorge Crichigno et al. (2007) studied the Protocols and Architectures for Channel Assignment in Wireless Mesh Networks.
The relay selection for the route discovery in reactive routing has optimized by Huda Al Aamri et al. (2012) Proposed, a novel routing protocol for ad-hoc networks, named as On-demand Tree-based Routing Protocol (OTRP). In this protocol mingles the design of hop-by-hop routing (as used by AODV) with an well-organized route discovery algorithm called Tree-based Optimized Flooding (TOF) to get better scalability of ad-hoc networks when there is no earlier knowledge on the destination.

Gupta & Das (2002) have studied the Energy-Aware On-Demand Routing for Mobile Ad Hoc Networks. Density-based probabilistic routing algorithm (AODV-Probabilistic) has been introduced by Hean-Loong Ong & Essam Natsheh (2012) for MANET. Under ideal settings, it is proved to provide extreme performance upgrading above AODV and OLSR routing protocols. They have studied the result of imprecise location information caused by node mobility in a wealthy set of scenarios. They recognized three different environments: a high density, a variable density and a sparse density. Their results show perceptible enhancement under the three environments. Their proposed algorithm get able to 22% longer links lifetime than AODV and 45% extended links lifetime than OLSR at the three environments on average exclusive of gaining any more routing overheads or powerful computation.

The Energy-Efficient Routing Protocols in Ad-Hoc Networks has been studied by the Dinesh Singh et al. (2011). They have considered the AODV, DSR, and DSDV algorithms for simulation. They have measured the performance based on the various parameters such as packet delivery fraction, average end to end delay and number of packets dropped. The Energy Management in Zone Routing Protocol for Ad-Hoc Networks has been investigated by DilliRavilla et al. (2012). Energy managements in wireless networks are the process of managing the sources and consumers of energy in
a node or in the network as a whole for enhancing the lifetime of the network. Since, most of the mobile nodes on the network are able to with little power batteries, it could be hard for a mobile device to maintain for a extended time if it sends and receives data more frequently. To solve this problem, they described the power management issues in mobile nodes using modified Zone Routing Protocol.

The Energy-Efficient OLSR (EE-OLSR) routing protocol for Ad-Hoc Networks has been studied by De Rango et al. (2008). They compared EE-OLSR with the classical OLSR protocol as achieved, testing a number of famous energy aware metrics and take in how EE-OLSR do better than to save battery energy in a dense mobile network with high-traffic loads. Dhurandher et al. (2010) described a mechanism for reducing congestion while routing bulky data in Ad-Hoc Networks. They have proposed a protocol named as Congestion Aware Selection of Path with Efficient Routing (CASPER). The results showed that the proposed protocol performs better in terms of network throughput and transmission delay in case of bulky data.

Hussain et al. (2009) has suggested an enhanced the low-energy adaptive slot allocation scheduling algorithm for Wireless Sensor Networks. Vivek Raghunathan and Kumar, PR (2006) studied the Congestion Control in the Wireless Networks. Wen Song and Xuming Fang (2006) have studied the Congestion Control Using Cross-layer Design in Wireless Mesh Networks. Bouhorma et al. (2009) expressed the comparison of Ad-Hoc Networks routing protocols AODV and DSR performance in Ad-Hoc Networks, both the protocols were simulated and compared in terms of packet loss ratio, end to end delay, with mobile nodes varying number of nodes and speed. Simulation revealed that although DSR perfectly scales to small networks with low node speeds, AODV was preferred due to its more efficient use of bandwidth.
2.5 IMPROVEMENT OF QOS FOR MANET ROUTING PROTOCOL

The Quality of Service is overall observing function for end to end communication in all the efficient factors for the network. The following literature survey on QoS has been contained further enhance the overall performance of proposed methods.

Ratanchandani et al. (2003) proposed a hybrid gateway discovery approach to discover gateways that limits the effects of broadcast overhead. In this approach AODV and two Mobile IP foreign agents are used to attach mobile ad hoc network and the Internet. However, the Time To Live of the foreign agent's advertisement is limited to only a few hops. Thus, only mobile nodes that are close to one of the foreign agents receive the agent advertisements. Nodes that are further away have to solicit advertisements reactively. Intermediate nodes are approved to reply on a solicitation with agent advertisements and to snoop and cache agent advertisement information that is sent by unicast to the requesting mobile node. Ghassemian et al. (2005) proposed an approach in which the scalability of both proactive and reactive is compared with respect to the number of Internet Gateways. The fixed access network together with the Ad-Hoc network creates a multi hop access network. The hybrid Internet gateway discovery approach has also been compared, that shows the average packet delay and the packet delivery ratio. This approach is beneficial because the packet delivery ratio is higher and the signalling overhead is also lesser for more gateways.

Sun et al. (2002) in their approach, an Ad-Hoc network is connected to a foreign agent, which exhibits the similar working as an Internet gateway (IGW). Internet Gateway assigns a global prefix for the Ad-Hoc network, which makes it possible for mobile nodes in Ad-Hoc network to communicate
with the Internet. In integrating MANET and INTERNET AODV is used for route discovery and maintenance within MANET, while Mobile IP gives away for mobile nodes to get care-of addresses.

Rakesh Kumar et al. (2010) proposed that, when a mobile ad hoc network is linked to the Internet, it is significant for mobile nodes to sense presented Internet gateway as long as there is access to the Internet. Gateway discovery time has strong control on packet delay and throughput. A bare minimum hop path may not forever be capable if some nodes on the path have a extended interface queue of waiting packets. Thus, the centre of work analyzes existing load-aware routing protocols in mobile ad hoc network and then based upon this investigation; set up a proactive load-aware gateway discovery scheme that accounts for size of an interface queue in accumulation to the conventional least hop metric and also permits an able handoff from one IGW (Internet gateway) to another IGW and still sustains a seamless connectivity to a stable host.

Broch et al. (1999) proposed a solution for the integration of MANET with Mobile IP using a source routing protocol. It contains a border router, which has two interfaces. The communication within the ad hoc network is carried out through the DSR protocol, while its interface connected to the Internet is configured to use normal IP routing mechanisms. Mobile nodes in an Ad-Hoc network are assigned with the home addresses from a single network. The nodes within range of the foreign agent act as gateways between the Ad-Hoc network and the Internet. As a reactive approach, foreign agent discovery is only carried out when required. Traditional IP routing is used for the Internet side, while within MANET DSR protocol is used. Foreign agents are responsible for connecting the Ad-Hoc network with the Internet.
Hamidian et al. (2003) proposed to Internet linking to ad hoc networks by altering the AODV routing protocol using proactive, reactive and hybrid approach and based on the number of physical hops to gateway as the metric for the gateway choice. Rekha Patil (2008) discuss a cost-based power aware cross layer design to AODV using discovery mechanism herein algorithm uses Battery power of a node as a routing metric. This approach is based on midway nodes manipulative cost based on the battery power. The midway node judges its ability to forward the route request packets or drops it. That is it incorporates the routing judgment of a network layer with battery power evaluation of MAC layer.

B.Ramachandran et al. (2005) showed that it is significant to reduce the amount of control packets to save resources and to look up the overall performance on the network. AODV is engaging as a capable on demand routing protocol of low routing overhead and high performance. The mobility adaptive cross layer design to enhance the performance of AODV routing protocol by establishing stable routes has been proposed. The adaptive verdict making is performed according to the speed of mobile nodes on Route Request packet forwarding results in stable routes. The impact of node density in the network of the proposed algorithm, describes when to invoke the cross layer design in mobile ad-hoc networks.

Muhammed Kamrul Islam (2013) developed a various performance metrics, wherein different cross-layering approaches is used in which different OSI layer information is swapped. AODV is a well-liked distance vector proactive routing algorithm. In the investigation a modified AODV routing protocol, based on route discovery by using Physical Layer information in its place of the least hop count approach of the default distance vector algorithm has been investigated. The simulation results show enhancement on the live default AODV performance metrics similar to mobile
ad hoc network traffic throughput, application-specific response time, data dropped, delay, etc.

2.6 EXTENSION OF GATEWAY FORWARDING STRATEGIES USED FOR MANETS.

Trujillo F D et al. (2009) stated the proactive gateway discovery schemes, the time giving out of MRA messages (Modified Router Advertisement) which is fixed to a constant value T. The optimal value of T is based on the network circumstance such as load, node mobility and number of traffic sources. Here, the gateway adjusts the T obtained into describing the number of received MRA messages, which are retransmitted by the gateway's neighbours. When the gateway receives various MRA messages it means that all these nodes have updated the routing entry to the gateway as a result.

Alicia Trivino Cabrera et al. (2009) aimed to adapt the time of giving out of MRA messages to the mobility and traffic conditions of the mobile ad-hoc network. So, lower overhead is obtained while the losses do not increase. This scheme is based on the number of Modified Router Solicitation (MRS) messages generated by the mobile nodes in an interval of time called the MRS_COUNT_INTERVAL. The numbers of received MRS messages indicate the mobility and the necessity of updating the routes to the Internet. In this scheme, the expected behavior of mobile nodes which send the MRS messages has been observed to predict how many requests are expected to be received by the Internet Gateway in the next interval. This decision is taken based on the information about how the network is behaving at the moment and how it has behaved in the past.

Jelger et al. (2004) discussed a proactive gateway discovery approach that initiates a limited flooding mechanism based on the prefix
continuity property. Gateways from time to time send out GW_INFO advertisements, but every ad hoc node simply forwards the messages which it uses to configure its own IP address. This property assures that each node contributes to the similar prefix than its next hop to the gateway, so that the MANET gets separated into as several sub nets as gateways are present. Its run along with a reactive routing protocol is when a node must check whether it has a bi-directional link with a neighbor before choosing it as its upstream neighbor. To confirm this, a simple protocol which engages the sending of the neighbor identifier (NBID) control messages is executed.

Khaleel Ur Rahman Khan (2008) described, various wireless communication techniques which are business-related offered similar to Bluetooth, Wireless LAN, and GSM to name a few. Admission to the Internet via wireless communication devices has become a key issue due to the development of an every-IP network in the 4G wireless networks, which is no infrastructure, but self-governing, individual and a self-organizing network. It can be deployed in more or less any surroundings. However, it has restricted wireless coverage and partial connectivity. Mobile IP and IP micro-mobility protocols to enable the mobile host to access the Internet and change points of attachment with no loss to the connection has been analyzed.

2.7 ADAPTIVE GATEWAY DISCOVERY IN HYBRID MANETS.

Mari Carmen Domingo et al. (2007) described an adaptive gateway discovery move forwards to diminish congestion problems in an ad hoc network, and that helps real-time applications to keep their QoS parameters even in an existence of high traffic. This approach identifies a transmission range where the gateways at regular intervals send advertisement messages, and they are broadcast about a limited zone. If a mobile node
desires Internet connectivity, and out of the gateway's transmission limit with propagation zone of the gateway's advertisements, it should broadcast a message to the group of gateways in the ad hoc network.

Pedro M. Ruiz et al. (2005) drafted a new adaptive gateway discovery approach supported in the dynamic adjustment of the TTL of GW_ADV messages. In this approach, the TTL of the GW_ADV messages is used as the parameter to change, based on the network conditions. The higher TTL value, the larger overhead is due to the periodic advertisement and the lower overhead connected to the reactive discovery of the Internet gateways. That is, the higher TTL to proactiveness of the approach. When TTL is NIL then it matches to an entirely reactive approach. While, when TTL is equal to network diameter it matches to an entirely proactive scheme. Bin et al. (2005) suggest an adaptive gateway discovery scheme that dynamically changes the TTL value of GW_ADV messages. This protocol offers internet access to MANET mobile nodes using mobile IP. The protocol uses foreign agents to track and forward packets to and from mobile nodes. Foreign agent periodically calculates the average hops by RREQ_I message or registration request sent by mobile nodes requesting Internet connectivity. So the transmission range of GW_ADV can be adjusted dynamically according to real time applications demand.

Bok-Nyong Park et al. (2007) focus an adaptive gateway discovery approach for everywhere connectivity of ad-hoc network with the Internet. This approach develops the load-balancing feature. After the routes are discovered to gateways, ad hoc mobile nodes should be able to select one Internet gateway providing the best Internet connection. In the Internet gateway selection, this approach uses a method to distribute data packets into different gateways while keeping low offered load.
Pedro M. Ruiz et al. (2005) proposed a innovative adaptive gateway discovery algorithm described ‘maximal benefit coverage’ based on the dynamic alteration of the scope of the gateway advertisement packets. The ability of proposed scheme in simulations to adapt to the changes on the network a condition allows it to outperform the alternatives of existing mechanisms over a variety of scenarios and mobility rates. Pedro M. Ruiz et al. (2004) proposed an analytical representation to estimate survival proposals and this propose is simulates two innovative adaptive gateway discovery algorithms named as maximal source coverage and maximal benefit coverage and is based on dynamic adjustment which the scope of gateway advertisement packets. The results showed outperformance of existing mechanisms over a variety of scenarios and mobility rates. Deepak Kumar Patel (2013) logically proposed a model to estimate the performance of an adaptive gateway discovery algorithm which improves the quality of service of transmitting the data and decreases the congestion overhead so that the advertisement messages are forwarded only up to the active sources in the network. Important study of some of the recommend adaptive gateway discovery approaches with future direction by Pandey et al. (2015).

2.8 MULTICAST TRANSMISSION

The following literature survey is valuable to enhance the proposed methods from unicast transmission into multicast transmission in Mobile Ad Hoc Networks. Bala Krishna and Doja (2010) deliberate the performance of Structure Based Multicast Routing Protocols in Mobile Ad hoc Networks. Elizabeth M Royer and Charles E Perkins (2000) have suggested and modified the Multicast Ad hoc On-Demand Distance Vector (MAODV) routing. Multicast Zone Routing Protocol in Wireless MANET has been proposed by Mallaiah et al. (2010). They also proposed the Reliable Adaptive Congestion Controlled multicast (ReAct) transport layer protocol for reliable
and timely multicast delivery on top of the MZRP. Moreover, ReAct’s local recovery mechanism, manages to prevent the source from reducing its rate unnecessarily, thus achieving maximum throughput.

Ma Xiang (2012) has studied the Multicast Routing Protocols for enhancing the Mobile Ad Hoc Networks performance. Narsimha et al. (2011) has compared the multicast routing protocols in Ad Hoc Networks in which the majority of applications are in the areas where rapid deployment and dynamic reconfiguration are necessary. Providing efficient multicasting over Ad Hoc Networks, faces many challenges includes scalability, QoS, reliable service, security, Address configuration and Applications for multicast over Ad Hoc Networks. Perkins (2008) described that the Ad Hoc Network enables wireless devices to network with each other as needed.

The stability based multicast routing scheme in Ad Hoc Network has been presented by Rajashekhar Biradar et al. (2010). They proposed a mesh based multicast routing scheme that finds stable multicast path from source to receivers called Enhanced On-Demand Multicast Routing Protocol (EODMRP). It is observed that the proposed scheme produces better packet delivery ratio, reduced packet delay and reduced overheads. Stavros Athanassooulos et al. (2004) studied the Experimental Comparison of Algorithms for Energy-Efficient Multicasting in Ad hoc networks. Sung Ju Lee et al. (2000) has compared the performance of Wireless Ad Hoc Networks multicast protocols. In this setting, routing/multicasting protocols are capable of producing multi hop routes under host mobility and bandwidth constraints. They simulate a set of envoy Wireless Ad Hoc multicast protocols and estimate them in different network scenarios.
Xiaofeng Zhang and Lillykutty Jacob (2004) described the MZRP Protocol for Multicasting in Ad Hoc Networks. The Zone Route Protocol (ZRP) is a hybrid unicast protocol that proactively preserves routing information for a local neighborhood, while reactively obtains route to destinations away from the routing zone. They extended the ZRP for application to multicast routing and call it the Multicast Zone Routing Protocol (MZRP). MZRP is a spread tree multicast routing protocol that proactively sustains the multicast tree connection for nodes’ local routing zones at every node while setting up multicast trees on-demand. It is scalable to a huge number of multicast dispatchers and groups. Zhong Li et al. (2012) examined the Multicast capacity scaling for inhomogeneous MANET compared with unicast capacity bounds. They classified the mobility into two cases according to the strength of mobility of each node, called strong and weak mobility, respectively. Two corresponding scheduling schemes and routing policies combined with the Manhattan multicast tree methods are proposed by them.

2.9 SUMMARY

This chapter provides vast information regarding Mobile Ad Hoc Networks environment. From the review of literature, it is concluded that many researchers have proposed different algorithms and carried out analysis on different aspects to enhance their concepts in Gateway Route Discovery. Further, these analyses were carried out with different network simulators with efficient transmission and developments in QoS. Energy conservation is an important considerable perception to enhance the Mobile Ad Hoc Networks lifetimes well as its stability. The higher-energy consumption leads to increased network interference by reducing the energy consumption and thereby reducing the interference of the network. There is intent to improve the energy conservation by modifying the existing protocol with considerable parameters to route nearby nodes with reduced control overhead.
This literature survey helps to propose a modified routing protocol to enhance the Mobile Ad Hoc Network performance. The concepts of the Adaptive Gateway Discovery routing are most valuable in the existing protocol and have some demerits in the Mobile Ad-Hoc Networks. This research work proposes the Modified Adaptive Gateway Discovery schemes to find efficient paths that are taken into the mobile node to gateway node for routing method and combines with the control overhead of the Mobile Ad Hoc Networks, to overcome the demerits of the existing system and also to enhance the overall network performance.