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Survey on the RIP, OSPF, EIGRP Routing Protocols

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***Abstract*— In this modern internet era, routing protocols plays a vital role. Determines how the communication is done in router. To forward the packets. From source to destination .in this paper, we surveyed Performance evaluation of various routing protocols. With certain criteria's like Jitter, Convergence Time, end to end delay, etc.**

1. INTRODUCTION:

As long as a number of ip addresses can be used, the routing configuration is required so that these computers can communicate with each other even in different network. Misconfiguration of the routing table can cause problems that can interface the data transmissions such as packet loss and delay. The worst problem that can happen is the loss of important information that is sent. This disorder can occur because the improper configuration of routing tables on the routers, the router device is down, or loss connections between routers. There are two different way to configure routing tables in the router. The routing tables on the routers can be configured by using static routing or active routing. Used for a Computer network that is not too large, it is advantageous to using static routing. In addition to save router resources, the configuration is not too difficult. When the computer network is larger, the use of static routing will be harder for administrators who are responsible to manage the routing tables. The number of entries in the routing table and also the accuracy of each entry is a key factor for the performance of the computer network. If there are changes that occur in the topology, routing tables must be updated soon. So the packet sent on the network is not discarded because of an error in the routing table.

The classification of routing protocol is depicted in below. Where there are some dynamic routing protocol can be used to configuring routing tables in the router. There is Interior Gateway Protocol (IGP) than should be used for the routers in same domain network such as Routing Information Protocol (RIP), Enhanced Interior Gateway Routing Protocol(EIGRP), Open Shortest Path First (OSPF) and IS-IS(Intermediate System – Intermediate System). And for the routers in different domain network, Exterior Gateway Protocol (EGP) can be used such as Border Gateway Protocol (BGP).For the router in the same domain network, there are two types of dynamic routing protocols that can be used on computer networks, namely distance vector and link-state routing protocols. Both types of routing protocols have advantage and disadvantages. For the distance vector type, EIGRP (Enhanced Interior Gateway Routing Protocol) will be used. And for the link-state type, OSPF (Open Shortest Path First) will be used. Both of these dynamic routing protocols can be used in both IPv4 and IPv6 networks.

The classification of routing protocol:

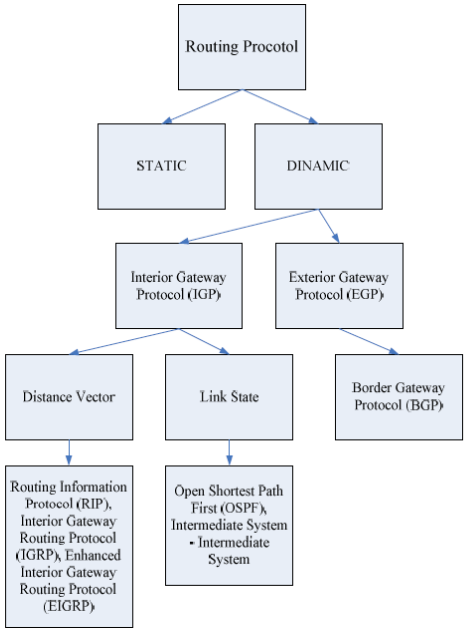

Fig: 1 Routing protocol classification

2. PREVIOUS WORKS

[1] OSPF (Open Shortest Path First) and EIGRP (Enhanced Interior Gateway Protocol) are routing protocol which is a member of IGP (Interior Gateway Protocol). OSPF and EIGRP will distribute routing information between routers in the same autonomous system. This research wills find how routing protocols works and compare those dynamic

routing protocols in IPv4 and IPv6 network. This research will simulate some network topology and shows that EIGRP are much better than OSPF in many different topologies.

[2]This paper looks at an approach for tuning dynamic routing systems using link metrics and focusing on the EIGRP dynamic routing protocol in order to get consistent and expected failover of dynamically routed links in complex networks. It examines: architectural issues for designing enterprise network backbones with redundant links; operational routing issues associated with configuring "hot spare" routers and contingency backbone sites; and finally a metrics system for tuning the routing system where multiply redundant links (redundant groups of redundant links) are used.

[3]In this paper we evaluate the Enhanced Interior Gateway Routing Protocol (EIGRP) via packets simulation. EIGRP, an intra-domain routing protocols developed by Cisco, is mainly based on the Diffusing Update Algorithm (DUAL) which computes shortest paths distributed without creating routing-table loops or incurring counting-to-infinity problem. Previous studies showed EIGRP's ability to adapt quickly to routing changes in medium-scale networks. In our research, we developed a detailed simulation model of EIGRP (publicly available), and we used it to evaluate EIGRP performance under a very dynamic network. Our results showed that EIGRP converges faster than a single TCP timeout in most cases. The simulated network was a composite of wired and wireless hosts, and the results hold for both types of media. In addition, the study showed a feasible approach for seamless mobility and continuous connectivity for users of mobile wireless devices as they move within an Autonomous System (AS).

[4]This paper presents the implementation decisions to be made when the choice is between protocols that involve distance vector or link state or the combination of both. Here a comparison is made between different parameters and a detailed simulation study is performed on the network with Different routing protocols and it has been shown that EIGRP provides a better network convergence time, less bandwidth requirements and better CPU and memory utilization compared to OSPF also RIP.EIGRP, OSPF also RIP are the active routing protocol being used in the practical networks to propagate network topology information to the neighboring routers. There have been a large number of static and dynamic routing protocols available but choice of the right protocol for routing is dependent on many parameters critical being network convergence time, scalability, memory and CPU requirements, Security and bandwidth requirement etc.

[5] In this paper, we model power of core routers which are using OSPF and EIGRP protocols. The model can accurately predict the power consumption of the routers with an important speedup. Also we establish the total quantity of routers required to support thousands of servers in the mentioned network. Simulations done with NS2 in a wide range of network configurations to support the proposed model. Results obtained from the simulations are in agreement with those obtained by the model.

[6]This paper settles an open question with a positive answer: Optimal traffic engineering (or optimal multicommodityflow) can be realized using just link-state routing protocols with hop-by-hop forwarding. Today's typical versions of these protocols, Open Shortest Path First (OSPF) and Intermediate System-Intermediate System (IS-IS), split traffic evenly over shortest paths based on link weights. However, optimizing the link weights for OSPF/IS-IS to the offered traffic is a well-known-hard problem and even the best setting of the weights can deviate significantly from an optimal distribution of the traffic. In this paper, we propose a new link-state routing protocol, PEFT that split traffics over multiple paths with an exponential penalty on longer path. Unlike its predecessor, DEFT, our new protocol provably achieves optimal traffic engineering while retaining the simplicity of hop-by-hop forwarding. The new protocol also leads to a significant reduction in the time needed to compute the best Link weights. Both the protocol and the computational methods are developed in a conceptual framework, called Network Entropy Maximization that is used to identify the traffic distributions that are not just most select, but also achievable by link-state routing.

[7]This paper will compare the convergence delay caused by link failures in both EIGRP and OSPF.

[8]In this paper we present a method of transmitting routing updates in IPv6 network. Routing protocol to use separate packet to send/receive routing updates are susceptible to instability in a limited bandwidth or loss relations setting. We learn and evaluate our technique by OSPF also EIGRP and show that it stabilizes extra quickly. By plan, our process is robust and it is not susceptible to bandwidth limitation and to the degree of lost packets like other routing protocols.

[9]In this paper we analyze the challenging problem of energy saving in IP networks. A novel network-level strategy based on a modification of current link-state routing protocol, such as OSPF, is future; according to this strategy, IP routers are able to power off some network links during low traffic periods. The proposed solution is a three-phase algorithm: in the first phase some routers are elected as exporter of their own Shortest Path Trees (SPTs); in the second one the neighbors of these routers perform a modified Dijkstra algorithm to detect links to power off; in the last one new network paths on a modified network topology are computed. Performance study shows that, in an actual IP network, even more than the 60% of links can be switched off.

[10]In this paper we examine the network performance when using three routing protocols, RIP, OSPF and EIGRP. Video, HTTP and Voice application where configured for net move. We as well examine the behavior when using link failure/recovery controller between network nodes. The simulation results are analyzed, with a comparison between these protocols on the effectiveness and performance in network implemented.

3. OVERVIEW OF DYNAMIC ROUTING PROTOCOLS

3.1 Routing Information Protocol (RIP)

[11]The Routing Information Protocol (RIP) is a veteran distance-vector routing protocol that uses UDP ort 520 for message encapsulation. It consists of two message types.

1. A request message is used to ask neighboring routers to send an update.
2. A response message carries the update.

When RIP is configured on a router, it sends Broadcast packets containing the request message out the Entire RIP enabled interfaces and then listens for response messages. Routers receiving the request message respond to it by sending their routing tables in the response message. This process continues until the network is converged. A RIP router sends out its full routing table in its update once in 30 seconds. If any new entry is found in an update, the RIP router enters it into the routing table along with the sending router's address. It uses the hop count as a metric for determining best paths. The maximum hop count is15; thereby preventing routing loops in the network. This also limits the size of the network supported by it. If the hop count of an incoming route is 16, it is considered to be inaccessible or undesirable and is at an infinite distance. RIP prevents inappropriate information from propagating throughout the network, by the use of its features like split horizon, route poisoning and hold down timers, thus providing stability to the network. RIP can perform load balancing for up to six equal-cost links.

3.1.1 Versions:

RIPv1: RIPv1 supports Class full routing; therefore variable length subnet masks (VLSM) cannot be used. There is also no authentication mechanism.

RIPv2: RIPv2 supports Classless Inter-Domain Routing (CIDR).It uses MD5 mechanism for authentication.

[12]In modern IP-based networks can transmit information using different ways of addressing and delivery: delivery of a particular specified device (unicast), multicast delivery (multicast) and broadcast delivery (broadcast). All these types of information delivery imply the use of routing protocols. Separate no less interesting question is the multipath routing. For example, for high-priority voice traffic can pave a path through the network, and for low priority - other. In many works dealing with routing protocols, provides a description of them, or the advantages and disadvantages. There is therefore a need for a qualitative comparison, and forming recommendations for the use of protocols, which would give an idea of the possibilities for their use.

3.1.2 Unicast Protocols

For the research produced a model data network of the Kharkov region. To analyze the mechanisms of traffic control and efficiency of routing algorithms has been selected fragment of a network of 16 nodes - regional centers. For communication between nodes using data channels Ukrtelecom. This network was modeled in the system MathCAD. In the network nodes are regional centers that form the flow of information, which is calculated based on the number of population and statistics. Proceeding from the above was calculated internet load created by subscribers, each regional center, and inter-station load. For all protocols were constructed routing tables. After reviewing the study protocols were designed and useful service burden on the communication line using study protocols.

3.1.3Multicast Protocols

The comparative analysis of routing protocols based on the model network created in the software package Network Simulator and consisting of two hundred routers with varying number of users in the group. It introduced the concept of value in use of network resources in the group transfer, measured in the number of transmitted packets per second. By value means the total amount of load generated useful and official traffic, consisting of traffic addressed to user's not belonging to the group and the traffic that arises when connected (disconnected) users. A comparative analysis of multicast routing protocols and proposes recommendations for their practical application. In particular, assess the performance of protocols and the cost of communication versus the number of network nodes, the recipients in a group capacity.

3.1.4Multipath Routing

Multipath routing involves optimizing the use of network resources in terms of distribution network load and as a consequence - to prevent overloads, as well as increases fault tolerance. Before multipath routing seeks to find the optimal path for one or more of the network. Heuristic algorithms and approximation algorithms with polynomial and pseudo polynomial time computations are often used to solve this problem. However, existing solutions suffer from excessive computational complexity. In addition, they help to solve the Problem only in special cases (for example, two constraints without optimization, one constraint with optimization, etc.)Expected to compare the best-known algorithms and technologies with the use of multicriteria network model.

3.1.5 Router-protocol based methods

[13]Router-protocol based topology discovery methods are the methods that establish the topology of the Network from the information got from routers in the network. As the RIP protocol and OSPF protocol are the main router protocols used in the network, topology discovery methods based on these protocols are mainly discussed.

a) RIP-based method

RIP is the shortened form of Routing Information Protocol. It is a protocol that used to exchange the Route information between gateway and computers. It is classified as an interior gateway protocol (IGP). It uses the distance-vector routing algorithm. It broadcast its route information by UDP. The message is sent every 30 seconds, so it can adapt with the network changes. The RIP employs hop count as a routing metric. We can deduce the connections between routers through the hop counts. Thus, RIP can be used by topology discovery.

RIP-based method is a passive method in IP layer. The precondition of this method is that the routes in the network use RIP protocol as the tool of the route information exchanges. RIP-based method is quick and accurate in a small or middle network. However; it may cause serious problems in a large scale network. As RIP uses UDP to broadcast its route messages, the messages are not reliable for it may be lost in the network. And it is unsafe to broadcast messages in a large scale net. It may be incomplete RIP response messages if limit times are allowed broadcasting. However, when many broadcast messages are sent, it may cause broadcast storm, which can cause the network breakdown. Besides, RIP protocol defines count of16 as the state of unreachable. It is not appropriate to large network. Hence, RIP-based protocol is available for small or middle network.

b) OSPF -based method

Due to the shortage of RIP protocol, OSPF protocol is used in large network. OSPF is shortened form of Open Shortest Path First. It is a dynamic routing protocol used in Internet Protocol networks. Specifically, it is a link-state routing protocol and falls into the group of interior gateway protocols, operating within a single Autonomous system. It gathers link state information from available routers and constructs a topology map of the network. The topology determines the routing table presented to the Internet Layer which makes routing decisions based solely on the destination IP address found in IP datagram. OSPF was designed to support Variable-length subnet masking (VLSM) or Classless Inter-Domain Routing (CIDR) addressing models. OSPF detects changes in the topology, such as link failures, very quickly and converges on a new loop-free routing structure within seconds. It computes the shortest path tree for each route using a method based on Dijkstra's Algorithm, a shortest path first algorithm. The topology of the network can be generated by collecting the OSPF messages.

3.1.6 RIP Internet Protocol Failure Analysis and Research

[14]As the network is running there is often a process of change, such as the failure of network equipment transmission lines often blocked, causing the routing of these changes also occurred a corresponding change in. In order to maintain the routing table entries are correct and effective, RIP routing table is updated periodically, and sends the updated routing table to adjacent routers. In addition, the routing table associated with each entry has a timer. When running RIP in the router that a route is not updated within the time prescribed, the route to measure the values set to infinity and marked for deletion, when another60 seconds to remove from the local routing table of the route. Thus, when the router exchange routing information with other routers, other routers know that the route has been ineffective.

Although the RIP algorithm is relatively simple, but there are some drawbacks.

1) RIP subnet address is not the concept. If a C class address in the last 8 bits of host number is 0, then the RIP cannot distinguish between non-zero parts is a subnet or a host address.

2) RIP router in the routing table provides the maximum hop count is 15, when the source host to a number of hops between the destinations hosts more than 15, the router that is unreachable.

3) RIP route selection is the only measure of the number of hops; it cannot be combined with other network routing performance considering the pros and cons.

4) When the network fails, need to go through a longer time to transfer this information to all routers. This process is relatively slow, slow convergence may cause problems, so not suitable for frequent changes in routing, large-scale Internet environment.

3.2 ***Open Shortest Path First (OSPF****)*

[1]Link-state routing protocol is also known as shortest path routing protocol, as it compute the finest path in the network which is the shortest path available from the source network to the destination network. Each router joined the routing domain, will held link state databases which consist of a router list in the network. Every router has the same database. The database then is used to describe to network topology.

Each router in the same domain will run the algorithm using their link-state database. Firstly, they will build a tree with each router as the root. Then, the tree consists of shortest path available to each router in that network. Other router which is joined the network will be known as leave. Link-state advertisement (LSA) is responsible for the routing information exchange between routers. Neighbor router information can be known each time LSA is received.LSA is sent by each routing using flooding method. Each router floods its LSA to the network, and then each router will receive the LSA and processed it. Every time a network topology altered, router will send LSA to the networks. Thus the other routers will know about the network topology changes soon. Dijkstra algorithm is used to computes the shortest path from each router to other router in the same routing domain. Dijkstra algorithm used cost for each link available in the router for the computation. OSPF is a routing protocol developed by Interior Gateway Protocol (IGP) working group of the Internet Engineering Task Force (IETF) for Internet Protocol (IP) network. OSPF is a connect state routing protocol that is used to distribute routing information within a single Autonomous System (AS).

OSPF has five different packet types. Each packet has a specific purpose in OSPF route. Lower OSPF packets.

1. Hello packet.
2. Database description.
3. Link state request packet.
4. Link state update.
5. Link state acknowledgement packet.

The Advantage of OSPF routing protocol are:

1) OSPF is not a CISCO proprietary protocol.

2) OSPF always determines the loop free routes.

3) If any changes occur in the network it updates fast.
4) Low bandwidth utilization.
5) Support multiple routes for a single destination network.
6) OSPF is based on cost of the interface.
7) Support Variable Length Subnet Mask (VLSM)

The disadvantages of OSPF are:
1) Difficult to configure
2) More memory requirements.

[11]The OSPF is an open standard protocol that is most popularly used in modern networks. It is a link state protocol. It features the concept of areas to provide scalability. The key factor in designing an OSPF network is the assignment of router and its links to an area(s), which is whether it has to been put in Area 0 (Backbone) or any other non-backbone area. We take many factors into account while making this design.

For choosing an area, the most significant factors that are to be considered are stableness and redundancy. The size of an area must be optimal so that this enhances the stability. Because, for some change in state of a link for a route, each router in that area needs to re-calculate its routes and this would definitely takes up a significant amount of the router's CPU resources.

When there exist multiple equal cost paths to the same destination, OSPF performs load sharing across all the links. OSPF supports only manual summarization and that too, only at the Area Border Routers (ABRs) and Autonomous System Boundary Routers (ASBRs). Hierarchic network220 2012 International Conference on Recent Advances in Computing and Software Systems design and an ordered address assignment scheme decides the scalability of the network. If we have a high capacity link and if the count of prefixes is small, then the new routers can be added. Each OSPF router sends Link-State Advertisements (LSA) over all its adjacencies .Based upon the way the routing has to happen, areas are classified into five types.

1) Backbone (area 0)
Allows Router LSA, Network LSA, Network Summary LSA, ASBR Summary LSA and AS External LSA
2) Non-backbone, non-stub
Allows Router LSA, Network LSA, Network Summary LSA, ASBR Summary LSA and AS External LSA
3) Stub
Allows Router LSA, Network LSA, Network Summary LSA
4) Totally Stub
Allows Router LSA and Network LSA
5) Not-so-stubby
Allows Router LSA, Network LSA, Network Summary LSA, ASBR Summary LSA and NSSA External LSA.

OSPF uses bandwidth for metric calculation. Based upon the bandwidth of the link that is being used, a metric value is assigned. The higher the bandwidth, the lower is the metric (cost) assigned. For example, for an Ethernet link of bandwidth 10 Mbps, the cost assigned would be 10. Sum of the costs for the entire path gives the metric for a Route. And the metric for a summary route would be the best metric of the individual routes present in that summary. Based upon the information available in the topology table, each OSPF router runs SPF (Shortest path First) algorithm and calculates the shortest path to every prefix within the same area. In case of any change in the state of a link, the OSPF router sends it in a partial update and is flooded throughout the entire network.

[15]OSPF areas and address aggregation are crucial in enabling OSPF to scale for AS domains comprising hundreds or thousands of subnets; specifically, they play an important role in optimizing router and network resource consumption, as explained below.

1) Router Memory: For OSPF areas not directly connected to a router in the AS, the router's routing tables only need to contain entries corresponding to subnet aggregates rather than individual subnet addresses. In other words, a router stores individual subnet addresses in its routing table only for the OSPF areas that are directly linked to it. This observably leads to lesser routing table sizes and, thus, lowers memory requirements at routers.

2) Router Processing Cycles: The link-state database maintained at each router is much smaller, since it only needs to include summary information for subnets belonging to OSPF areas not directly connected to the router. Consequently, the computational cost of the shortest-path calculation decreases substantially.

3) Network Bandwidth: For subnets within each OSPF area, only aggregate address information (rather than individual subnet addresses) is flooded into the rest of the AS network. As a result, the volume of OSPF flooding traffic necessary to synchronize the link-state databases of the AS routers is significantly reduced.

3.3 ***Enhanced Interior Gateway Routing Protocol (EIGRP)***

[1] Distance vector routing protocol present routes as function of distance and direction vectors where the distance is represented as hop count and direction is represented interface. In the distance vector routing protocol, Bellman-Ford algorithm is used for the path calculation where router take the position of the vertices and the links. For each destination, a specific distance vector is maintained for all the router joined the network. The distance vector consists of destination ID, shortest distance and after that hop. Now every node passes a distance vector to its neighbor and informs about the shortest paths. Each router depends on its neighboring routers for collecting the routing information. The routers are responsible for exchanging the distance vector. When a router in the network receives the advertisement of the lowest cost from its neighbors, it followed by add this admission to the routing table.

In distance vector routing protocol, the router do not know the information of the entire path. The router knows only the information about the direction and the interface where the packet will be forwarded. One of distance vector routing protocol is Enhanced Interior Gateway Routing Protocol

(EIGRP). EIGRP is a CISCO proprietary protocol, which is an improved version of the interior gateway routing protocol (IGRP). Route computation in EIGRP is done through Diffusion Update Algorithm (DUAL).
Depicts the protocol structure of EIGRP packet.

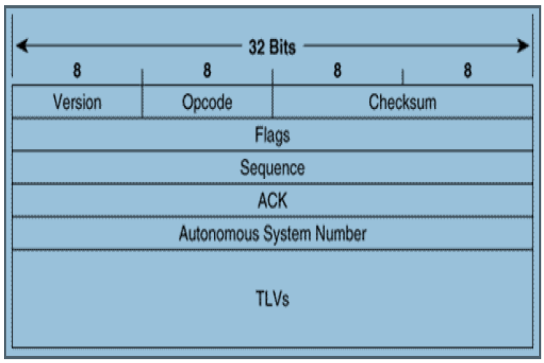

Fig: 2 Structure of EIGRP packet.

The advantages using EIGRP are as follow:
1) Easy to configure.
2) Loop free routes.
3) Keeps backup path to the destination network.
4) Convergence time is low and bandwidth utilization.
5) Support Variable Length Subnet Mask (VLSM) and Classless Inter Domain Routing (CIDR).
6) Supports authentication.

The disadvantage of using EIGRP is as follow:
1) Considered as Cisco proprietary routing protocol.
2) Routers from other vendor are not able to utilize EIGRP.

[11]EIGRP, a brainchild of Cisco Systems, implements the best features of distance vector protocols as well as link state protocols and hence is considered as a hybrid protocol. EIGRP features a unique diffusing update algorithm (DUAL) for calculating best paths to a destination. It is extremely powerful in reducing the convergence delay that we typically have in a modern network.

EIGRP also has a great quality of being very easy on CPU utilization for devices. It is scalable; it does accommodate very large networks. EIGRP features a very simple configuration. Automatic summarization is enabled by default; so EIGRP acts in a class full manner and automatically summarizes prefixes. It also supports routing for multiple network protocols like IP, IPX, and AppleTalk through the concept of Protocol Dependent Modules (PDM), by which EIGRP process uses a different route table for each network layer protocol.
Five possible components used by EIGRP in metric calculation:

1) Bandwidth: Weakest link bandwidth in the total path
2) Delay: Sum of the delays for the entire path
3) Reliability
4) Load
5) MTU

If we pick up reliability and load for metric calculation, the metrics would be changing way too often and this will cause instabilities and problems in CPU utilization. So it was decided to use only bandwidth and delay. MTU is not involved in metric formula at all and it is just a potential tie-breaker. These components have corresponding Values. And the metric can be manipulated accordingly, changing these K values. For two EIGRP routers to become neighbours, these values must match.
3.3.1 DUAL – Terminologies:
1) Feasible Distance (FD) is simply the cost between the local router and the destination prefix.
2) Advertised Distance (AD) is the cost from next hop to the destination prefix. It is also called Reported Instance (RD).
3) Successor is the best (lowest cost) route to the destination.
4) Feasible Successor is the next best route to the destination.
The advantage with DUAL is that when a successor fails, it is immediately replaced by a feasible successor into the routing table. While choosing a feasible successor, it has to satisfy the feasibility condition – Next hop must have AD less than current FD of the current successor.
3.3.2EIGRP Status Codes:
1) Passive – network available
2) Active – network unavailable
3) Update – network is being updated
4) Query – outstanding query – waiting for ACK
5) Reply – generating a reply to a query
6)Stuck In Active (SIA) – router is querying about a network that is unavailable and not getting any responses back and this leads to convergence problem. We can prevent this SIA state by using summarization or Stub router concept.

4. SCENARIO DESIGNED

[16]The various protocols we analyzed are RIP, OSPF, IGRP and EIGRP respectively. Then for OSPF we have divided the network into areas. OSPF-area 1 is confined to communicate within a given area whereas in OSPF- area inters network communication is allowed.

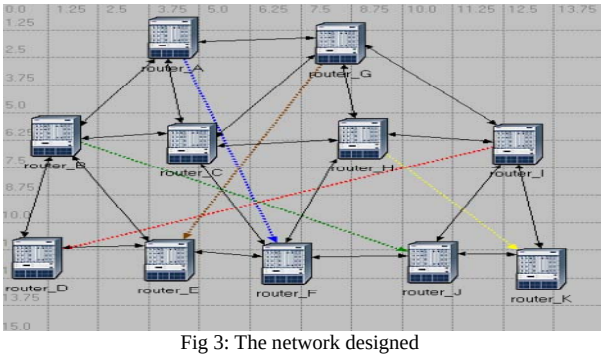

Fig 3: The network designed

5. ANALYSIS

We have analyzed the performance of various routing protocols naming RIP, OSPF, IGRP and EIGRP over a scenario of size 15 sq km consisting of slip8_gateway routers and on simulating the network we obtained the following results for best effort traffic which are shown below in table 1

which shows cost of transmission between two routers for different protocols. We also have analyzed overhead on routers and overall performance in terms of throughput, queuing delay and link utilization figures 4-8 show the results obtained.

TABLE 1.
COMPARISON ON BASIS OF COST OF DELIVERY

Protocol	OSPF	OSPF-area1	OSPF-area2	RIP	IGRP	EIGRP
A-F	25	nil	25	30	40	25
I-D	30	nil	40	45	30	40
H-K	25	25	25	25	25	25
E-G	30	nil	30	35	40	35
B-J	25	nil	25	40	25	25

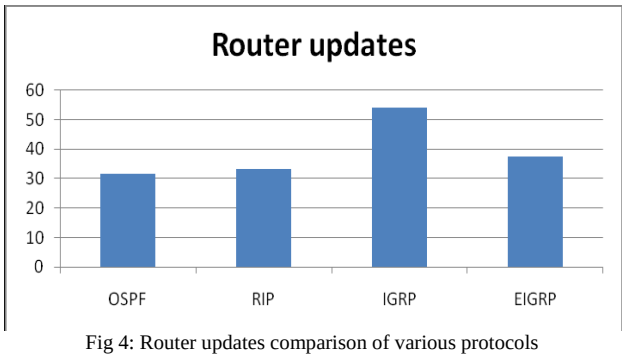

Fig 4: Router updates comparison of various protocols

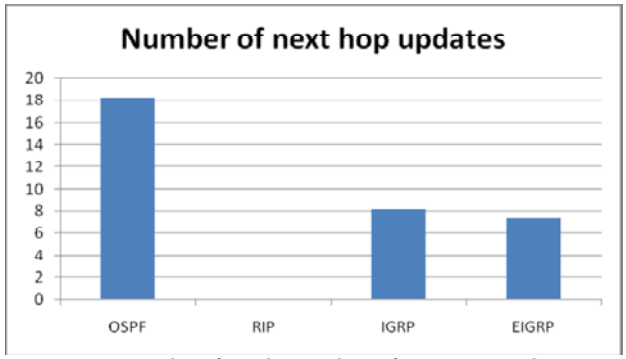

Fig 5: Number of next hops updates of various protocols

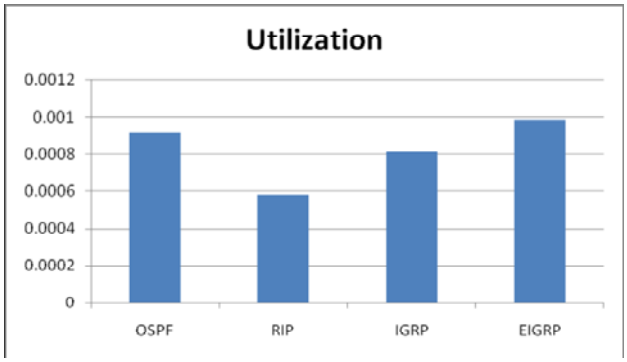

Fig 6: Link utilization of various protocols

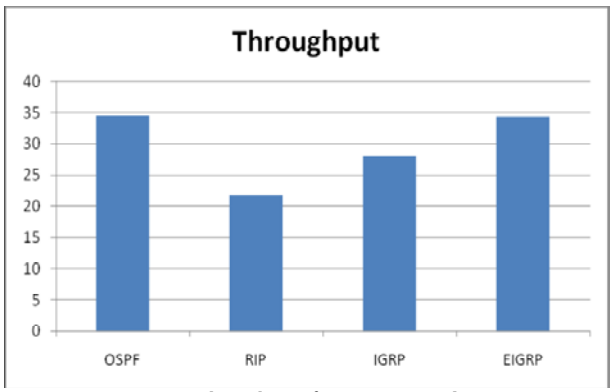

Fig 7: Throughput of various protocols

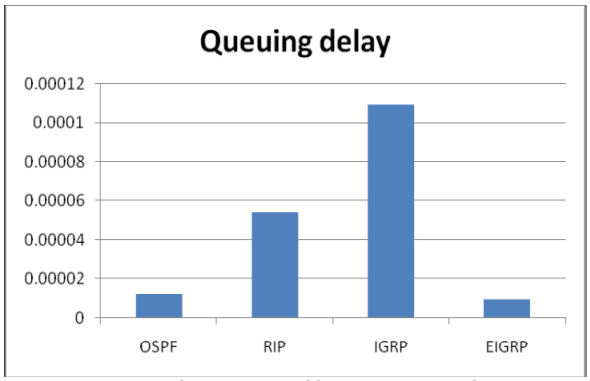

Fig 8: Delay encountered by various protocols

As per table 1 OSPF has the least cost of transmission followed by EIGRP, IGRP and RIP. In case of router overhead shown in figure 4-5 IGRP has the maximum overhead followed by EIGRP, OSPF and RIP. And on analyzing the performance parameters like throughput, utilization and delay, as per results plotted OSPF has the maximum throughput followed by EIGRP, IGRP and RIP shown in figure 6; for the case of queuing delay EIGRP has the least delay followed by OSPF, RIP and IGRP shown in figure 8 and for the case of link utilization EIGRP has the maximum link utilization followed by OSPF, IGRP and RIP as shown in figure 7.

6. CONCLUSION

In recent years, routing protocols has unique challenges and design issues in this Paper; we have discussed evaluation of various routing protocols parameters are varied for various routing protocols. When it is used real scenarios.

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