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BEHAVIOR OF OSPFV3 AND RIPNG WITH REMOTE LOGIN, HTTP, AND E-MAIL PROFILES USING OPNET14.5

AMARJEET KAUR, PRABHDEEP SINGH
M-TECH STUDENT,CSE DEPARTMENT,GIMET,PUNJAB,INDIA
ASSISTANT PROFESSOR,CSE DEPARTMENT,GIMET ,PUNJAB,INDIA

Abstract: *As per growing demand to have better communication networks in modern internet era, communication networks are growing very rapidly. To get better communication, network routing protocols play an important role. It is responsible to deliver data from source node to destination node in the network, and the working structure of routing protocol depends on his algorithm. To get better communication, routing protocols should response better in all networking term like delay, packet drop and throughput .There are many protocols are lying in Internet Protocol Network such as RIPng and OSPFV3 protocols to evaluate the performance parameters on basis of various applications like data base, E-mail and HTTP servers. As per result, we conclude that RIPng has got better results than OSPFV3.we used OPNET 14.5 simulator.*

Key words: OPNET, ETHERNET DELAY, HTTP, RIPng, OPSFV3 INTERNET PROTOCOLS

1 Introduction: In modern era, we can see the increasing demand of computer networks is growing rapidly day by day. So there s enormous pressure on big it giant to build high capacitive, efficient ,traffic free communication networks for having better access of As communication and internet data. Various types of networks need to be analyzed based on different IP routing protocol concerned with different behavioral metrics and depends upon static, Hybrid , dynamic routing protocols . In the IP network, routing protocols play great role to transfer the data packets from one node to another. Routing process divided in terms of static or dynamic and routing protocol which are used to choose best route from one node to another in given network and for routing updates and also provide us the facility to find out best route path having two types of working functionality, first concerned to select best route from one node to another and other is to transmit data successfully on given destination remark. Routing protocols describe the whole working scenario of routers on the basis of communication between them, route detection, updating routing table and neighbor's data and router generally used to connect multiple networks and provides technique to transfer the data packets from one node to another. When we talk about IP networks, the main task of a routing protocol is to carry information or data packets from source and transmit it to destination. by hopping such as one-hop or multi hop count metrics..We evaluate the behavioral parameters of RIPng and OSPF V3 routing protocol. Routing mainly concerned with determine best route and transferring the information one node to another destination node and it fully depends on which type of routing protocol is there.

2RIP (ROUTING INFORMATION PROTOCOL)RIP usually known as routing information protocol is a distance vector algorithm and working structure depends on Bellman-Ford algorithm, and acted less rapidly than link state protocols. It is easy to configure. It evaluates the best path between hosts to destination by using hop count methodology. Hop count concerned with router which is directly attached to network is set to 0 and if it is attached directly to router, set to 1 and A per given algorithm, the hop count limit set to from 1 to 15 and if it exceeds the given hop count metric

from 15 to 16, considered as infinite means does not approach to network destination and represent status is unreachable

2.1RIPv1: the routing protocol RIPv1 to uphold the Class full routing methodology so it is clear that it cannot act and used variable Length subnet masks (VLSM) cannot be used. The methodology is not concerned with authentication. It updates for every 30 seconds and hold-down for 180 seconds. Its working structure depends on hop count method. The security level is low.

2.2RIPv2: the routing protocol RIPv2 to uphold Classless Inter-Domain Routing (CIDR) technique. The methodology is fully concerned with authentication and has authority to stop or restrict unauthorized user and it uses variable-length subnet masking (VLSM) technique and also actively participating when any change take place, it automatically "Triggered updates" the routing table information that is concerned with neighbor router.

2.3RIPng it is the modified version of RIPv2 to uphold IPv6. RIPv2 encodes the next-hop into each route entry, RIPng need particularly encoding of the next hop for a set of route entries.

Limitations of RIPng are as follows:

It has maximum network diameter to support is 15 hops

- As the hop count metric is static so it cannot be dynamic, such as delay or available bandwidth, but instead the metrics are fixed

3 OSPF (OPEN SYSTEM PATH FIRST)

OSPF is called for IPv4 and OSPFv3 is called for OSPFv3 for IPv6. Both are link state routing protocol. OSPF is Open Shortest Path First is also known as Link-state routing protocol, responsible to find out better but shortest path for routing protocol. This routing protocol is designed for having a single autonomous system. OSPF (Open Shortest Path First) is an intra domain routing protocol and working structure depends on Dijkstra's algorithm used for choosing better paths for subnets. Before calculating the best path, each router creates its own map of networks (source and destination addresses) automatically. If any updated information acted, the router generates a link-state information which shows all link-states of the router. Flooding Exchanges the link states. Every router has its own record of all updates in the database and sends a copy to other routers. Then the best path is again evaluated. OSPF is an Autonomous System (AS) that can be divided into areas. Various Subsets of the routers are attached to different areas. All routers attached in a backbone area and communicated with each other. OSPF consider two areas. First is Normal Area and second is Stub Area. Normal area also known as default area and generally called it as regular area .Stub Area mainly concerned with external to the AS and doesn't get route information is called stub area .OSPFv3 is different from OSPF, the structure of OSPF packets has been changed .As per difference, we can say IPv6 addresses and indexes are defined by LSAs and OSPF runs over each link while in IPv4 it runs over subnets. The methodology is not concerned with authentication in IPv4.But in IPV6 it give technique to have Fast detection of changes in the topology and very fast re-establishment of routes without loops and Low level of congestion "triggered updates" methodology Division of traffic by several equivalent routes and Routing according to type of service and of course better Authentication.

4. SIMULATION

It's a software package by which we can evaluate the actual behavior of network, and we don't need to have actual network. In simulation, we can create and executed different parameters related to our network. Simulation of routing protocols is one of them. It's not a real network but has standard for research purpose and provides physical environment which is not possible in real.

4.1 OPNET

For this research, we used OPNET simulator 14.5 OPNET is high level simulation tool it has been used in many high level researches. OPNET gives us graphical user interface. It provides simulation of heterogonous networks by employing a various protocols Operation of simulation starts at packet level; it is built for predetermined networks at its beginning. There are many feature of OPNET in which, OPNET commercially used fixed network, protocols and hardware is available In OPNET there is also functionality of simulating wireless networks OPNET is also used for competing future researches by adding more things in it. End users and researchers take benefit in their work because it is high-level research tool.

4.2SIMULATION METHODOLODGY

Simulated network topology is shown in below figure represent whole over view of topology in which on location is shown. As per this research work we have been created three scenarios. First scenario is configured with RIPng protocol and then same network is created and OSPFV3 is implemented and finally in third scenario both RIPng and OSPFV3 protocol is implemented .

4.3OSPF-V3 Scenario:. As per this model, various routers, servers, nodes and various kinds of links are defined. All these are attached to each other by links. Names are given to routers and to others nodes. Routing protocols sent data from source to destination by using Dijkstra algorithm.

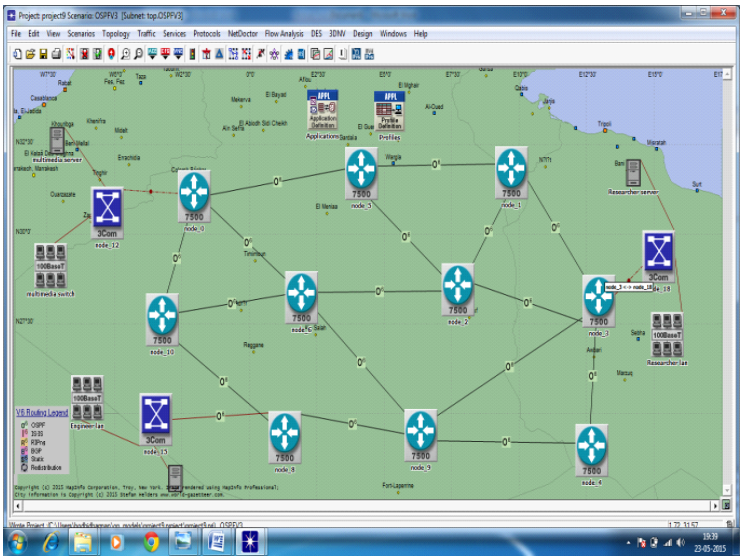

Figure 4.1: OSPF Scenario

4.4RIPng Scenario: The figure 4.2 displays the Scenario of RIPng protocol. This scenario shows the network model considered no. of different nodes, links, routers and servers. RIPng protocol based on Bellman Ford algorithm. Hop limit of RIPng is 15. Various no. of nodes is attached to each other and transfer information through this protocol. As per scenario, there is one application node and profile node where no. of nodes are mentioned.

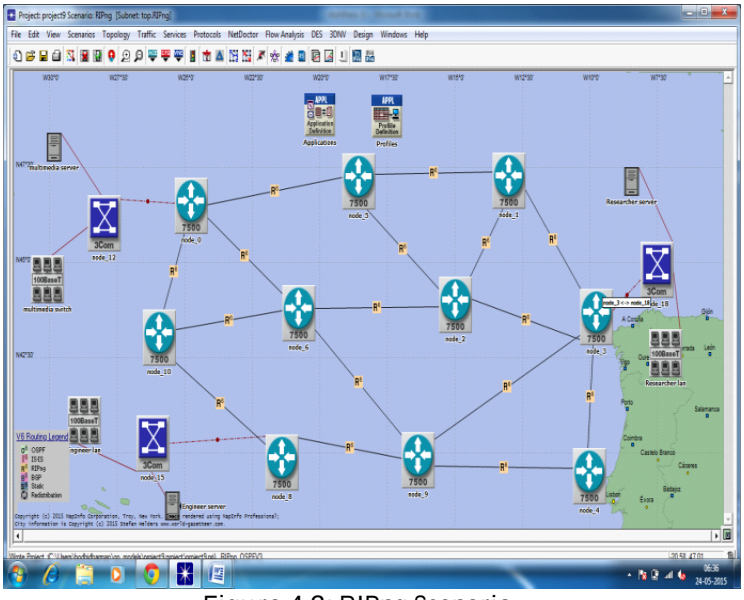

Figure 4.2: RIPng Scenario

4.5 Combined Scenario of OSPFv3 and RIPng The figure 4.4 represents the combined scenario of two different protocols. Different protocols worked on different nodes. According to different algorithms they worked on nodes. Then the performance calculated and compared with previous individual protocols

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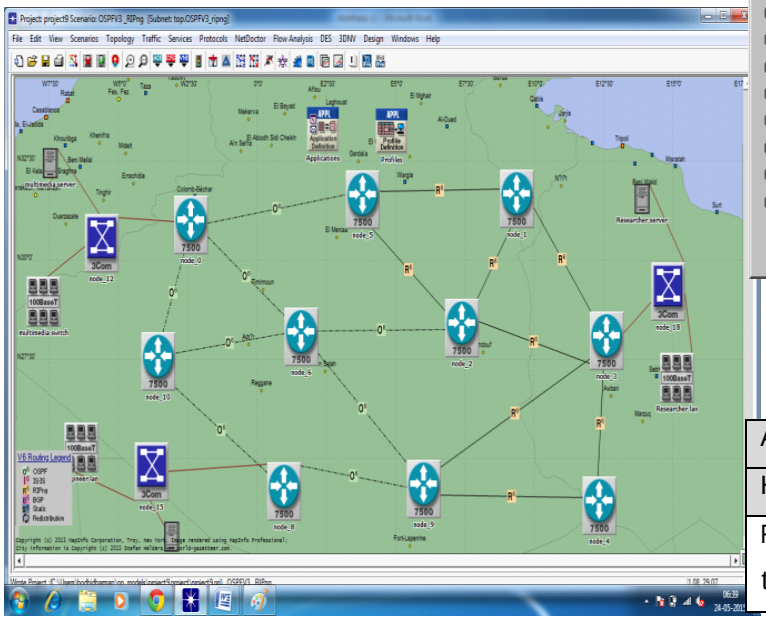

Figure 4.3: Combined Scenario of OSPFv3 & RIPng scenarios

RESULTS & DISCUSSION : We have obtained the various results of OSPFV3 ,RIPng and both combined networks scenarios . performance of both protocols has been measured by video end to end delay ,voice end to end delay, Ethernet delay, voice jitter ,Most value .

4.6 Performance comparison in terms of page response time(sec) in HTTP:

HTTP Page Response time concerned with time which is taken by loading a full web page. How much time protocol take to open a web page known as http page response time.

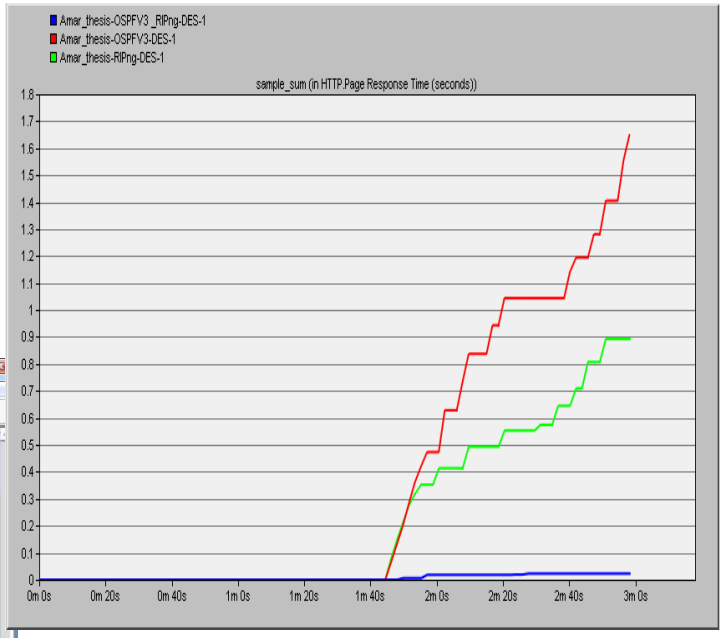

Figure 4.4: HTTP Page Response Time

Table 4.1: Packet delay variation (sec) in HTTP

Applications	Protocol	Protocol	Protocol
HTTP	OSPFv3	RIPng	Combined
Response time(sec)	1.6	0.89	0.02

As per given table it is mentioned that entire protocols results which represent HTTP Page Response Time ,it is clear that OSPFV3 shows us worst performance ,RIPng is better than OSPFV3.but overall OSPFV3 _RIpng means combined protocols provides us better results than both protocols

4.7 Comparison of scenarios in terms of E-mail Download Response Time :It is the time taken by the request to be responded for service. Service can be anything from memory fetch to disk or to complex database. When we considered real time applications like email download, response time deals very important part. Table 4.1 defined the values of different protocols. OSPFv3 and RIPng shows best results in figure 4.5

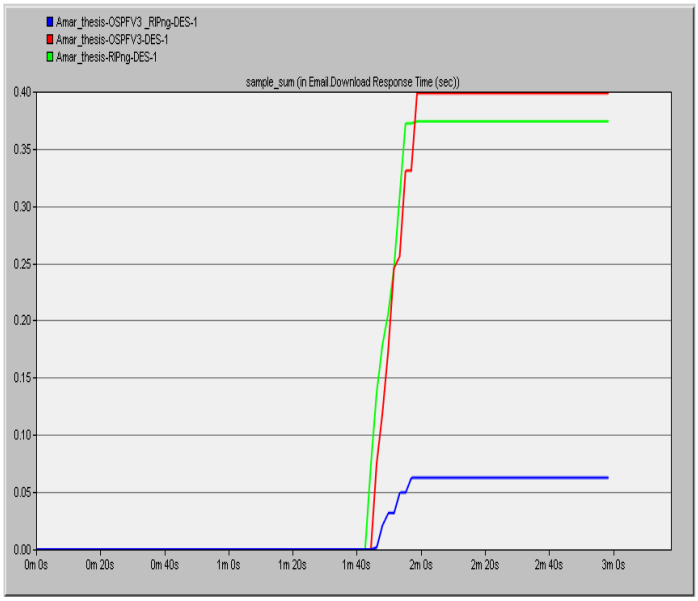

Figure 4.5: E-mail Download Response Time (sec)

Table 4.2: Table describes comparison in terms of download response time

Applications	Protocol	Protocol	Protocol
Email	OSPFv3	RIPng	Combined
Download Response Time	0.40	0.37	0.06

. 4.8 Comparison of scenarios in terms of E-mail Upload Response Time :It is the time taken by the request to be responded for service. Service can be anything from memory fetch to disk or to complex database. When we considered real time applications like email download, response time deals very important part. Table 4.2 defined the values of different protocols. overall OSPFV3 _RIpng means combined protocols provides us better results than both protocols

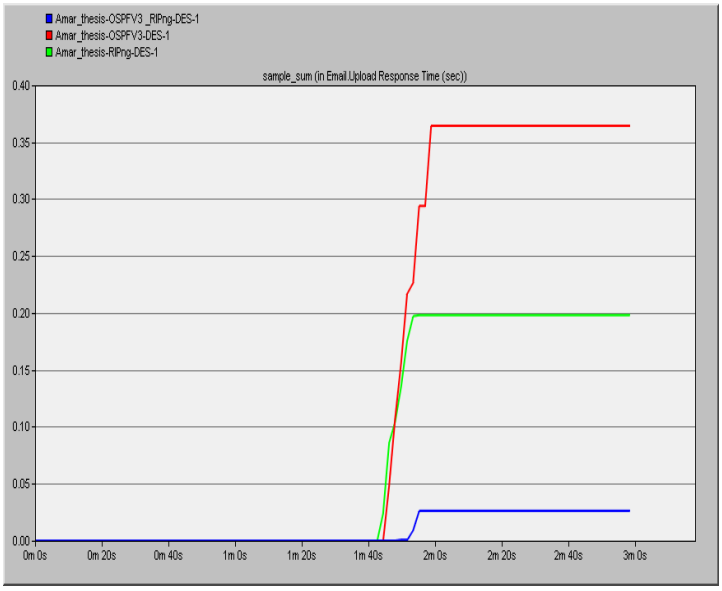

Figure 4.6: Upload Response Time (sec)

Table 4.2: Table describes comparison in terms of Upload Response time

Applications	Protocol	Protocol	Protocol
Email	OSPFv3	RIPng	Combined
Upload Response Time	0.37	0.20	0.03

As per given table it is mentioned that entire protocols results which represent download response time,it is clear that OSPFV3 shows us worst performance , overall OSPFV3 _RIpng means combined protocols provides us better results than both protocols.

4.9Remote login: how much time a system or computer takes to access the another system by remotely is known as Remote login. It accuracy speed may be different on different protocols which are using by user .

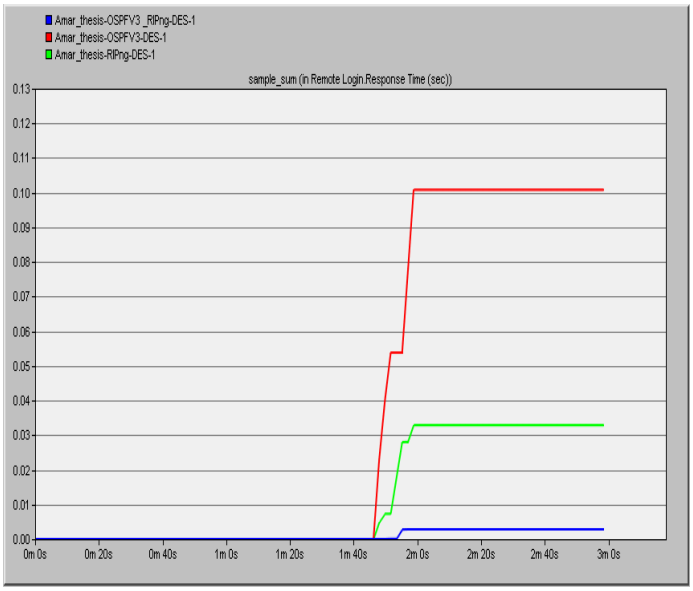

Figure 4.7 Remote login

Table 4.4: Table describes Remote Login

Applications	Protocol	Protocol	Protocol
Remote login(sec)	OSPFv3	RIPng	Combined
Response time	0.10	0.032	0.002

From, the above table it is described all the protocols results .in which shows Remote login Response time we can see that OSPFV3 gives us worst performance ,RIPng is much better than OSPFV3.but overall OSPFV3 _RIPng means combined protocols gives us best results than both protocols

5. CONCLUSION AND FUTURE SCOPE

Conclusions

Interior routing protocols like RIPng, and OSPF v3 are widely being used in the computer networking. In the present work Performance analysis of selected routing protocols such as RIPng, OSPF v3 and the combination of RIPng, and OSPF v3 calculated. The Performance analysis has been done on the same network with different protocols for real time applications. Performance has been measured on the basis of some parameters that aimed to figure out the effects of routing protocols .we obtained that combined protocols gives us best results in Http Page Response Time,E-mail Download Response Time, E-mail Upload Response Time, & also Remote login Response time Performance metrics.

Future scope

In future, a research work can be done on Security analysis for OSPF v3, RIPng and Further both protocols work can be done on non-real applications on different parameters and servers.

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