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BEHAVIOR OF OSPFV3 AND RIPng WITH MULTIMEDIA AND ETHERNET PROFILES

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Abstract

Internet is playing major role in the every field of technology. We cannot imagine human progress without the internet. All the functionality of internet is depended on Internet Protocols .we can say that Internet Protocols is backbone of Internet technology. The main task of protocols is to carry the packs (data) from source to destination. We can say that Internet Protocols is responsible for communication over the internet. There are many protocols lying in IP network .In this paper we have taken RIPng and OSPFV3 protocols and we analyze the various aspects of the behavioral metrics such as video end to end delay, voice end to end delay, Ethernet delay, jitter. We got that RIPng gives us best results rather than OSPFV3 & combination of RIPng_OSPFV3 .we used OPNET 14.5 for simulator work.

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

1Introduction As per the growing demand of communication and internet data on modern communication networks, different kinds of networks has to be implemented based on various IP routing protocol having various kinds of performance parameters and depends upon static, Hybrid , dynamic routing protocols . When we talk about IP network, routing protocols play vital role for transmitting packets from source to destination. Routing categorized in form of static or dynamic and routing protocol is used to select best route from source to destination in the network and for routing updates and also concerned with exact identification of route .it mainly works on two features .one is to choose best route from source to destination and other is successfully delivered information on that route. Routing protocols explained the working of routers to communicate each others, availability of routes, updating routing table and neighbour's data and router mainly used for connecting multiple channels and gives facilities to transmit information on exact destination .In IP networks, the main task of a routing protocol is to carry packets forwarded from one node to another. In a network, routing can be defined as transmitting information from a source to a destination by hopping one-hop or multi hop. Routing protocols should provide at least two facilities: selecting routes for different pairs of source/destination nodes and, successfully transmitting data to a given destination.we analyzed the performance metrics of RIPng and OSPF V3 routing protocol . Routing process deal with the detection of best route to transmit and forward the data packets from source to destination and this is based upon routing protocols.

2 ROUTING INFORMATION PROTOCOL

RIP uses a hop count to measure the distance to a destination. The hop count is known as a metric. The hop count from a router to a directly connected network is 0.The hop count from a router to a directly connected router is 1. To limit convergence time, a RIP metric ranges from 0 to 15. A metric value of 16 (or greater) is considered infinite, which means the destination network is unreachable.

2.1RIPv1

- A class full protocol, broadcasts updates every 30 seconds, hold-down period 180 seconds. Hop count is metric (Maximum 15).
- RIP supports up to six equal-cost paths to a single destination, where all six paths can be placed in the routing table and the router can load-balance across them. The default is actually four paths, but this can be increased up to a maximum of six. Remember that an equal-cost path is where the hop count value is the same. RIP will not load-balance across unequal-cost paths

2.2 RIPv2

- RIPv2 uses multicasts, version 1 use broadcasts,
- RIPv2 supports triggered updates—when a change occurs, a RIPv2 router will immediately propagate its routing information to its connected neighbours.
- RIPv2 is a classless protocol. RIPv2 supports variable-length subnet masking (VLSM)
- RIPv2 supports authentication. You can restrict what routers you want to participate in RIPv2. This is accomplished using a hashed password value.

2.3 RIPng

(RIP next generation) is an extension of RIPv2 for support of IPv6, the next generation Internet Protocol. The main differences between RIPv2 and RIPng are

- Support of IPv6 networking.
- While RIPv2 supports RIPv1 updates authentication, RIPng does not. IPv6 routers were, at the time, supposed to use IP sec for authentication.
- RIPv2 encodes the next-hop into each route entry, RIPng requires specific encoding of the next hop for a set of route entries.
- RIPng sends updates on UDP port 521 using the multicast group .

3 OSPF (OPEN SYSTEM PATH FIRST)

OSPF stands for Open Shortest Path First is also called Link-state routing protocol, mainly concerned with shortest path routing protocol. As per route, it determines the appropriate but best path from source to destination in network. Each router concerned with same link state database having list of routers in routing network domain and this link state database described network topologies. When any change in network topology occurred and resulted it goes for updating for same. The working structure of OSPF depends on Dijkstra algorithm and with the help of this algorithm; we can determine the best shortest path from source router to destination one in network and also calculate metric (cost) per link. Its working mainly depends on single Autonomous System (AS) .The modifications in existing OSPF for IPv4 occurred and has updated in form of OSPF for IPv6 but there is no any change in basic functionality of it. Well, there is one main difference between OSPF for IPv4 and OSPF for IPv6 is that the working structure of protocols depends on per link, not per subnet. It means does not include per-subnet hence IP subnets can communicate on single link and having direct communication Even if it's not sharing or connected through common IP subnet.When we talk about the hierarchy levels, OSPF consider two levels which deal with whole conceptual areas. So an area is having 32-bit number represents format of IP Address 0.0.0.0.As per working of it, 0 is set to represents that if more than 1 area used by the given network. 0 area also assigned to uphold network and treat as a main backbone but the whole areas must attached to that backbone, if it is not able to attached, use virtual link to be connected so that it can be assured that whether they connected with backbone .

4. SIMULATION

Simulation is a software package in which we can predict the actual behaviour of network, and we have no need of actual network. In simulation, we can set different parameters related to our network. Simulation of routing protocols is one of them. Simulation is not as real network but it is a standard for research purpose It provides environment like physical which is not possible in real.

4.1 OPNET

During this research we use OPNET simulator 14.5 OPNET is high level simulation tool it has been used in many high level researches. OPNET provide us graphical user interface . It enables 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

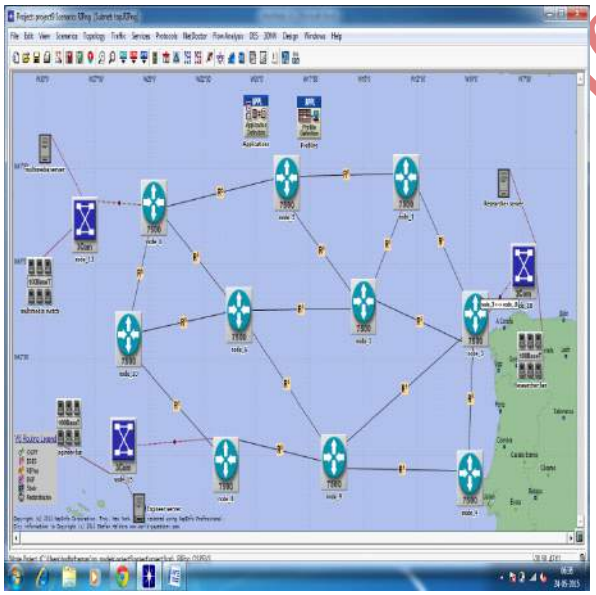
Simulated network topology is shown in below figure shows overall over view of topology in which on location is shown. In this research work we have been created three scenarios. First scenario is configured with RIPng protocol and then same network is created and OSPFV3 is implemented and finally in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

4.3OSPF-V3 Scenario:. In these network model different routers, servers, nodes and different types of links are defined. These modules are connected 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 represents the network model which consists of no. of different nodes, links, routers and servers. RIPng protocol based on Bellman Ford algorithm. Hop limit of RIPng is 15. Different no. of nodes is connected to each other and passes data using this protocol. In this 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

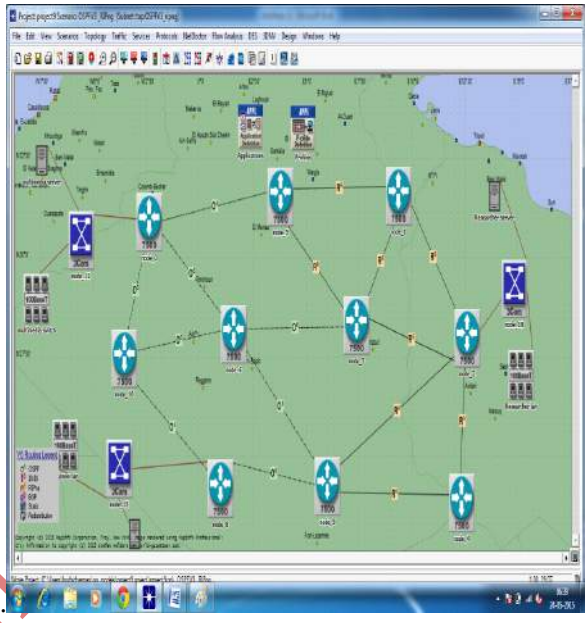


Figure 4.3: Combined Scenario of OSPFv3 & RIPng scenarios

4.6RESULTS & 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 .

4.6.1Performance comparison in terms of Voice End to End delay(sec)

When the packet transmitted on the network from source to destination then end-to-end delay time has been considered below figure represent that Voice End to End delay time we can see that OSPFV3 gives us worst performance OSPF_RIPng is much better than OSPFV3.but overall RIPng protocols gives us best results than both protocols

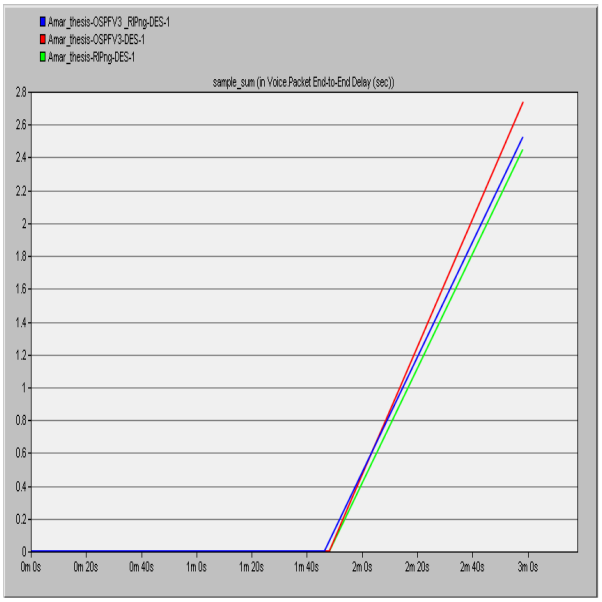


Figure 4.4: End to end delay in voice

4.6.2 Performance comparison in terms of Video End to End delay(sec)

When the packet transmitted on the network from source to destination then end-to-end delay time has been considered below figure represent that Voice End to End delay time we can see that OSPFV3 gives us worst performance OSPF_RIPng is much better than OSPFV3.but overall RIPng protocols gives us best results than both protocols.

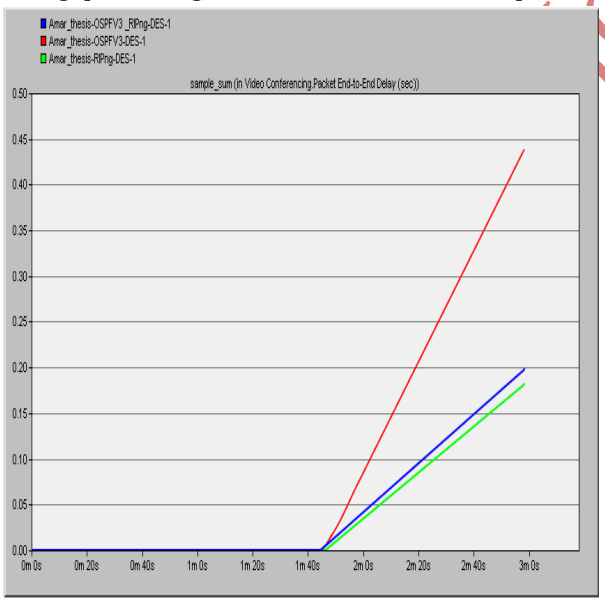


Figure 4.5: End to end delay in video conferencing

4.6.3 Performance comparison in terms of jitter in voice transmission (sec)

Jitter is defined as variation in delay times of received packets. At sending sides, packets are sent in a continuous stream in an equally spaced time slots. This rate is much lower than the average rate, resulting from traffic congestion and for improving performance of a voice network; this factor should be as small as possible.

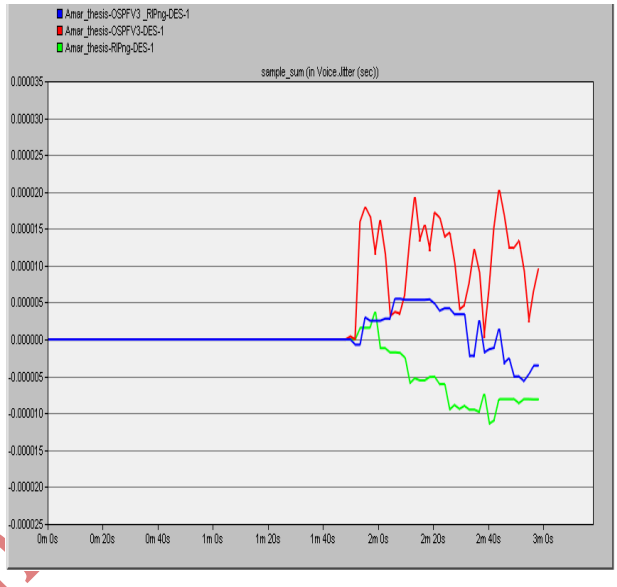


Figure 4.6: Jitter in voice

4.6.4 Ethernet Delay: Network delay is an important design and performance characteristic of a computer network or telecommunications network. The delay of a network specifies how long it takes for a bit of data to travel across the network from one node or endpoint to another. It is typically measured in multiples or fractions of seconds. Delay may differ slightly, depending on the location of the specific pair of communicating nodes.

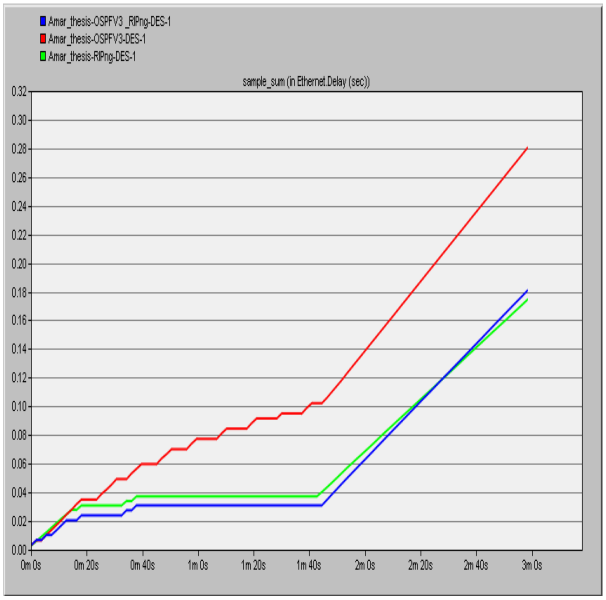


Figure 4.7 Ethernet delay

From, the above table it is described all the protocols results .in which shows E-mail download Response time we can see that OSPFV3 gives us worst performance OSPF_RIPng is much better than OSPFV3.but overall RIPng 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 RIPng gives us best results in Video, Voice, and Ethernet Performance metrics. We can say that overall RIPng performance is better than others both OSPFV3 & also OSPFV3_RIPng .OSPFv3 performance is worst in all the terms.

Future scope

In future, a research work can be done on Security analysis for OSPF v3, RIPng and Further both protocols work can tware Engineering Sadhana, vol 3, Issue 8, pp. 285-288. be done on non-real applications on different parameters and servers.

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