BEHAVIOUR OF OSPFV3 AND RIPng ON THE BASIS OF DIFFERENT PERFORMANCE METRICS

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Abstract

The modern era of communication through internet mainly depends on routing protocols which act as a gateway to forward the data in forms of packets. There are various kinds of protocols used to get better communication .As per the growing demands to have better communication networks, the study of researchers mainly concerned with better communication through routing protocols such as OSPF-V3 RIPng and many more. Which are based on IPV6.We used these protocols to conclude the behavioural metrics. In this paper we will focus to analyze the various aspects of the behavioural metrics with these protocols .

Keywords:OSPFV3,RIPng,ROUTINGPROTOCOLS, IPV6.

1. Introduction

As per the growing demands of internet having better communication network. Routing protocols plays a vital role based on forwarding the packets. Routing protocols is responsible to give exact direction to the packets from Source to Destination. .Routing protocols gives technique to transmit the information from one end to other end .in region of ipv4 and ipv6 having lots of protocols that exist. Each and every protocol has different kind of working nature. We explained as follow.

Three classes are common on IP networks as follows:

- Interior gateway routing over link state routing protocols, such as OSPF.
- Interior gateway routing over distance vector protocols, such as RIP, IGRP and EIGRP.
- Exterior gateway routing, such as BGP v4 routing protocol.

Link State Routing (LSR) protocols are also known as Shortest Path First (SPF) protocol where each router determines the shortest path to each network. In LSR, each router maintains a database which is known as link state database. This database describes the topology of the AS. In

Link State Routing information among the nodes are Exchange through the Link State Advertisements (LSA) because each LSA of a node contains all the information of its neighbours node .In Link State Routing Dijkstra's algorithm is used to calculate the cost and path for each link. The price of each link can also be represented as the weight or length of that link and is set by the network operator. By suitably assigning link costs, it is possible to achieve load balancing. If this is accomplished, congested links and inefficient usage of the network resources can be avoided.

Advantages of Link State–Based Routing Protocols

- Smaller routing tables.
  Only a single optimal route for each network ID is stored in the routing table.

- Low network overhead.
  Link state–based routers do not exchange any routing information when the internetwork has converged.
- Ability to scale.
  Between the smaller routing tables and low overhead, link state–based routing protocols scale well to large and very large internetworks.
- Lower convergence time.
  Link state–based routing protocols have a much lower convergence time and the internetwork is converged without routing loops.
- Complex.
  Link state–based routing protocols are much more complex and difficult to understand than distance vector–based routing protocols.
- More difficult to configure.
  A link state–based routing protocol implementation requires additional planning and configuration.

2. Routing Information Protocol (RIP) (Distance-vector protocols) RIP is a distance-vector routing protocol .it is mainly based on evaluating the exact direction and route length (Distance) from Source to destination to any node in given network . "Direction" generally represents the next hop address and the exit interface. Distance" is a measurement the cost of route length from user to destination to any node .Cost usually depends on route length from user to destination to any node and evaluating by different route parameters. RIP use a simple technique rather than other routing protocols to define the parameter (cost) of a route .RIP has two kinds of working scenarios. One is concerned to have message for updating neighboring routers and the other represents Acknowledgement for same. When we configured this Distance-vector protocol (RIP) on a router, it enables to send packets having request message out the whole RIP activates interfaces sounds for Acknowledged messages. Routers getting the request message and replied to it by delivered routing tables attached in Acknowledged messages. It happens regularly till the network is centralized. Router updates the entire table for every 30 seconds. If the new entrance is entered in given table, this RIP router indicates the sender address in given table of routing. RIP use the hop count as parameters to analyze better route. We considered limited hop count is15. It limits the network size and prevented loops in routing table. If it exceeds to16th, indicates unreachable distance and cant accessible and 16 th hops is considered to be Infinity

Drawback:- It represents heavy traffic in networks with periodic updates and it usually do not choose the fastest route. That's why RIP is concerned with small and fixed size rather than large networks. If it exceeds to16, indicates unreachable distance and cant accessible There is only one method (hope count) to analyze the pros and cons of performance parameters (cost) As per updating the technique in RIP version, we have RIP V1 RIP V2 and RIPng.

RIPv1: the routing information protocol version 1 to uphold Class full routing that's why variable length subnet masks (VLSM) cannot be used. It also has not used authenticated technique

RIPv2*:* the routing information protocol version 2 to uphold Classless Inter-Domain Routing (CIDR).It also has MD5 method used as authenticated technique.

RIPng Timers

Timer	Description	Default
Update	Amount of time (in seconds) between Ripng routing updates.	30 seconds.
Timeout	Amount of time (in seconds) after which a route is considered unreachable.	180 seconds.
Hold-down	Amount of time (in seconds) during which information about other paths is ignored.	180 seconds.
Garbage-collection	Amount of time (in seconds) after which a route is removed from the routing table.	120 seconds.

3. OSPFV3

Open Shortest Path First is the shortest path routing protocol is also known as Link-state routing protocol and it evaluate the best route in network from one end to another end. Every router consist same link state database included routers list having routing domain in the network and this database used to explained network topologies. As per OSPF, it is used to evaluate the shortest path OSPF works on Dijkstra algorithm and it is used to evaluate the best shortest route in network from one router end to another router end and also evaluate cost metric per link. It works on single Autonomous System (AS) .As per previous but existing OSPF for IPv4 has been updated for OSPF for IPv6 but the groundwork of primary things still same. Updates are mainly occurred due to change in network topology When we talk about difference between OSPF for IPv4 and OSPF for IPv6 is the protocols working as per link and it doesn't consider per-subnet so it is clear that IP subnets may allot to single link means if 2 nodes act on single link ,they can talk directly even without having common IP subnet.

OSPF Areas

There are two levels given by OSPF to cover all conceptual areas. An area represents 32 bit having IP address format 0.0.0.0 as it is like 0 and when network used more than one area, the 0 area allotted to support network and act as a backbone and entire areas in network must be connected to this backbone. If they could not attached to it, they must be connected through virtual link

OSPF contains couple of Areas as follows

Normal Area: It is a default area given in OSPF and generally called normal area and it also called regular area

Stub Area: These are the areas that act externally to the AS and don't get path information are called stub Areas.

Routing Protocol Comparison

Protocol	RIPng	OSPFv3
Interior/Exterior?	Interior	Interior
Type	Distance Vector	Link-state
Default Metric	Hop count	Cost
AD	120	110
Hop count Limit	15	None
Convergence	Slow	Fast
Update timers	30 seconds	Only when changes occur;
Updates	Full table	Only Changes
Classless	No	Yes
Algorithm	Bellman-Ford	Dijkstra

4. LITERATURE SURVEY

As per survey , we have gone through few papers ..in the paper titled" Behavior of Routing Protocols for Medium to Large Scale Networks" Authors explained the behavior of EIGRP, OSPF, RIP, IGRP and IS-IS using the parameters of network traffic, IP processing delay, packet loss ratio, CPU utilization, point-to-point throughput and point-to-point queuing delay. The OSPF protocol got the least IP processing delay on but OSPF represents more packet loss rate rather than other routing protocols. RIP is the best protocol in terms of utilizing point-to-point throughput. The IS-IS and the IGRP protocols do not seem to perform better than other routing protocols. In the paper titled,"Performance Analysis of RIP, EIGRP, and OSPF using OPNET". RIP showed good in form of VOICE packet delay because it is a Relies on distance vector algorithms. RIP represents less protocol traffic rather than EIGRP and OSPF. RIP's showing good behaviour s in small network

but weakness is slower convergence time in larger networks. The paper "Performance Evaluation of Real Time Applications for RIP, OSPF and EIGRP flapping links using OPNET Modeler" explained OPNET simulation assessing the IP network running RIP, OSPF and EIGRP to uphold VOICE, VIDEO and HTTP traffic, response time. We concluded page response time showed that EIGRP performance too bad rather than OSPF and RIP. Performance of RIP and OSPF for page response time was equal. Simulation results of packet end-to-end delay and packet delay variation for VIDEO traffic OSPF has not got good result in both single flapping link and two flapping links. EIGRP was stable and behavior of RIP was good but having worst result in large network.It was concluded that a Dynamic routing protocol is mainly concerned with route identification, routing updates and selecting the best route from user to destination node in the network. In this paper , to analyzed the simulation behavioural identification on basis of RIPv2,EIGRP, and OSPF using OPNET. Researchers have gone through various behavioural parameters to analyze the behaviour of various routing protocols. RIPng OSPF with IPv6 routing protocols considered and analyze the behaviour of protocols is identified by behavioural parameters like response time, jitter, end to end delay, throughput, packet loss. As per results, it represents that RIPng showing good behaviour s in small and condensed networks rather than others. OSPF IPv6 showed better performance for medium-sized networks Overall EIGRP is more stable and consistent in both small and relatively large networks. in the paper titled "final project OSPF, EIGRP and RIP performance analysis based on OPNET" EIGRP , OSPF and RIP protocols have been taken and performance of protocols is checked by performance metric like network convergence, Ethernet delay, email upload response time, http page response time, VIDEO conferencing packet end-to-end delay, VOICE packet delay the evaluation results show that EIGRP compared to RIP and OSPF performs better in terms of network convergence activity and routing protocol traffic and Ethernet delay. OSPF performs better in terms of http page response time and VIDEO conferencing packet end-to-end delay. RIP performs better in terms of VOICE packet delay. in the paper titled "performance comparison of EIGRP/ IS-IS and OSPF/ IS-IS" EIGRP , OSPF and IS-IS protocols have been taken and performance of protocols is checked by performance metrics like throughput, http object response time, database response time and e-mail download response time. the evaluation results show that IS-IS convergence time in EIGRP/IS-IS network is much faster than OSPF/IS-IS . in the comparison of these protocols in database query response time, EIGRP/IS-IS shows a better database query response time than of the other protocols at the whole time. The EIGRP/IS-IS protocol performs very well in email download performance metric for the whole simulation time. in the http page response time IS-IS become better than other protocols.

5. CONCLUSION AND FUTURE WORK

This paper deals with the all aspects of ROUTING Protcol such as RIPng, OSPF V3 with (IPv6). Before it lot of work has been done with ipv4 .but this paper shows all the aspects of RIPng, OSPF V3 As what we have examined in this paper, it is clear that we may create and established the well defined network by OSPF V3 and Ripng (IPV6) protocols rather than ipv4. For future references, we will try to do more experiment to get better result for various kinds of routing with having IPV6 based protocols in OPNET Version 17.5.

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