

Survey on Network Performance Analysis of Various Dynamic Routing Protocols

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Abstract— In this current web period, routing protocols plays a fundamental part. Determines how the communication is done in router to forward the packets from source to destination. In this paper, we surveyed Performance evaluation of different dynamic routing protocols with specific criteria resembles Jitter, Convergence Time, end to end delay, bandwidth, hop count, and so forth.

Key words: Dynamic Routing Protocols, Network Performance

I. INTRODUCTION

In a computer network, the transmission of information depends on the routing protocol which chooses the best routes between any two nodes. Diverse sorts of routing protocols are applied specific network environment. Three typical types of routing protocol are chosen as the simulation samples: RIP, OSPF furthermore, EIGRP. RIP (Routing Information Protocol) is one of the most established routing protocols still in use. Hop count is the metric that RIP utilizes and the hop limit limits the network size that RIP can support. OSPF (Open Shortest path First) is the most generally utilized IGP (Interior Gateway Protocol) extensive venture networks. OSPF depends on the Shortest Path First (SPF) algorithm which is utilized to calculate the shortest path to each node. EIGRP Enhanced Interior Gateway Routing Protocol) is Cisco's restrictive routing protocol in view of Diffusing Update algorithm. EIGRP has the quickest router convergence among the three protocols.

II. LITERATURE SURVEY

Archana C (2015) [1], presented the Analysis of RIPv2, OSPF, EIGRP Configuration on router Using CISCO Packet tracer. Computer communication networks depend on an innovation that gives the specialized framework, where routing protocols are utilized to transmit packets over the Internet .Routing protocols indicate how routers communicate with each other by spreading data. The router has prior knowledge about the adjacent networks, which can help with choosing the routes between two nodes. There are different sorts of routing protocols being broadly utilized. Enhanced Interior Gateway Routing Protocol (EIGRP), Routing Information Protocol (RIP) and Open Shortest Path First (OSPF) have been considered as the pre-prominent routing protocols for real time applications.

Wired Local Area Network utilizing distinctive routing protocols are done by CISCO packet tracer simulator. The best protocol is EIGRP in light of the fact that it gives better performance than RIPv2 and OSPF, in terms of fast convergence time. While contrasting OSPF and RIP, OSPF dominates RIP in terms of average throughput

and instant delay in different size of network. For the routing traffic the OSPF was the one with the most activity sent and was the last one to send routing traffic then again EIGRP was the first to send traffic yet RIP protocol had minimal traffic as it sends just the quantity of hops, areas reduce connectivity, while expanding configuration complexity, routing path length, and traffic concentration The Interior routing protocol OSPF is broadly being utilized in the computer networking.

Gujarathi Thrivikram (2016) [2], presented the Study and Simulation of OSPF Routing Protocol Using Cisco Packet Tracer. In this paper, routing is the path the packet must be designed to flow the path that are appointed by the client in router. The routing protocol OSPF has been considered and executed using Cisco Packet tracer. The outputs are checked using ping command. Here the virtual network is made to test of OSPF protocol. The paper additionally clarifies about the configuring of IP address and designing them router. There are diverse sorts of routing techniques are there however because of the utilization and area of need. The OSPF is utilized for the area where more routers are utilized and furthermore huge network usage. It essentially utilize is that it has unlimited number of hops and Irrespective of different procedures it utilizes an idea of area to ease administration and traffic control.

Ioan Fitigau, et.al, (2013) [3], presented Network Performance Evaluation for RIP, OSPF and EIGRP Routing Protocols. The fundamental capacity of a network layer is to route packets from the source to the destination. Algorithms that are utilized for route selection and data structure are the fundamental parts for the network layer. Analyze the network performance, when utilizing three routing protocols such as, RIP, OSPF and EIGRP. Video, HTTP and Voice application where configured for network transfer and also inspect the behavior when utilizing link failure recovery controller between network nodes.

Distance vector algorithms are limited in selecting the best path that support network size, but RIP comprises in its simplicity and client experience of utilizing this algorithm. RIP is slower to converge, in light of the fact that routers changes are engendered at regular intervals and not in an instant. OSPF gives security facilities, and facilitate the utilization of various cost metrics, incorporated support for both routing unicast and multicast to a fast convergence. OSPF is an open standard protocol, comparing with EIGRP, which is a Cisco proprietary protocol. It is a strong protocol, joins the characteristics of distance-vector and link-state protocols, bringing about a hybrid protocol that is easy to configure, efficient, and fast. It has a faster convergence, improved scalability and superior handling in the routing loops.

Irem Dogan, et.al, (2016) [4], presented the Analyzing Performances of Dynamic Routing Protocols on

Various Network Topologies. Dynamic routing protocols are for the most part utilized in large-scale networks and routers, which are utilized to route information packets from own network to remote networks, can be overseen effortlessly by network administrator since dynamic routing protocols learn all of the network information dynamically. Execution of a dynamic routing protocol can change with various network topologies like ring, star and mesh. Point of dynamic routing protocols, sorts of dynamic routing protocols, investigations of dynamic routing protocols on various network topologies are done using CISCO packet tracer.

OSPF has the highest performance among all of the interior gateway protocols. Thus, utilizing OSPF on interior network is the best decision. BGP was made as a reason of the performances of the interior gateway protocols, which are RIPv1, RIPv2, EIGRP and OSPF, is insufficient. BGP is utilized between Autonomous systems (ASs), the essential networks which are components of the web design. In this manner, BGP is an exterior gateway protocol and its execution is higher than all of the interior gateway protocols.

Kirti Dangwal, et.al, (2014) [5], presented the Comparative Study of EIGRP and RIP Using Cisco Packet Tracer. Communication technology encourages arrangement of such administrations as file transferring, print sharing, video streaming and voice conferencing. Web is a worldwide arrangement of interconnected computer networks. Today Internet is assuming an essential part in communication networks. Computer communication networks depend on an innovation that gives the technical infrastructure, where routing protocols are utilized to transmit packets over the Internet. Routing protocols indicate how routers communicate with each other by spreading data. The router has earlier information about the neighboring systems, which can help with choosing the routes between two nodes. There are different sorts of routing protocols being broadly utilized. Among various routing protocols, Enhanced Interior Gateway Routing Protocol (EIGRP) and Routing Information protocol (RIP) and have been considered as the pre-famous routing protocols for real time applications.

RIP supports little networks, those too just 16 routers are the breaking point. EIGRP has works in both link state and distance vector protocols. In this manner, it gives better convergence, delay as per accessible bandwidth while choosing the rate at which it transmits updates. The point by point reproductions contemplate help to discover the best protocol out of two. Convergence time is faster than RIP networks, because EIGRP network can learn the topology information and updates more quickly.

Komal Gehlot, et.al, (2014) [6], presented the Performance Evaluation of EIGRP and OSPF Routing Protocols in Real Time Applications. There has been a fast development of the routing protocols in the area of communication. A routing protocol is a protocol which is capable to decide how routers communicate with each other and forward the packets through ideal path to venture out from source to destination. The execution of each routing protocol is not quite the same as each other. With regards to routing protocol execution, each of them has unique design,

flexibility, route processing delays, convergence capabilities and some more. Among various routing protocol, EIGRP and OSPF have been considered as the pre-prominent routing protocol for the ongoing applications. This paper is an investigation in view of recreation for similar execution assessment amongst EIGRP and OSPF routing protocol for real time applications by utilizing Best-Effort and Quality of Service technique in OPNET simulator. The assessment is done in view of various aspects such as, traffic sent and received, packet delay variation, as well as voice and video traffic sent/received using simulator to evaluate the performance of EIGRP and OSPF.

Pinky, et.al, (2016) [7], presented the Review Paper on Open Shortage Path First (OSPF) Protocol in Network. The OSPF is an open standard protocol that is most prominently utilized in modern networks. OSPF is a huge and complex protocol. The motivation behind any routing protocol is to proficiently distribute dynamic topological information among its members to facilitate routing algorithms upon which packet forwarding choices are then based. Because of the deficiency of RIP protocol, OSPF protocol is utilized in larger network. It is a dynamic routing protocol utilized in Internet Protocol networks. In particular, it is a link state routing protocol and falls into the gathering of interior gateway protocols, working inside a single Autonomous system. OSPF was intended to support Variable-length subnet mask (VLSM) or Classless Inter Domain Routing (CIDR) addressing models. OSPF identifies changes in the topology, for example, link failures, very rapidly and converges on a new loop-free routing structure within seconds.

There are two sorts of routing they are Link State routing and Distance Vector routing. Dijkstra's depends on Link State routing. In Link State routing each router keeps track of its incident links and cost on the link, whether the link is up or down. Each router broadcasts the link state to give every router a complete view of the graph. Each router runs Dijkstra's algorithm to compute the shortest paths and build the forwarding table. The topology of the network can be produced by gathering the OSPF messages.

D.Venkatavara Prasad, et.al, (2016) [8], presented the Study and Analysis of Dynamic Routing Protocols in real time for Optimal Resource Utilization Ideal choice of a dynamic routing protocol plays a huge part in affecting the performance and resource utilization of a networking device. The appropriateness of the protocol is highly dependent in-terms of bandwidth usage and ability to manage increasing number of entries in the routing table. In this paper, three surely understood dynamic routing protocols such as Routing Information Protocol (RIPv2), Enhanced Interior Gateway Routing Protocol (EIGRP) and Open shortest Path First protocol (OSPFv2) are studied and investigated based on the bandwidth used during convergence, using real-time networking devices. In addition to that, testing their unequal-cost, load balancing capability in order to address the issue of selecting the ideal routing protocol based on the network specifications/requirements is additionally completed.

RIP has a lesser complexity order contrasted with EIGRP and OSPF. Since EIGRP has the adaptability to configure various AS on a single router, it can support very

bigger networks. OSPF, which is reliant on the concept of areas, supports large networks too. Another critical factor is the straightforwardness with which network can be scaled. Scaling limits the entries in the routing table. At the point when the three protocols are thought about, EIGRP performs best by utilizing Autonomous System (AS), trailed by OSPF, which utilizes areas. RIP does not scale effectively. Considering CPU resources, OSPF performs ineffectively as it utilizes a complex SPF algorithm where as EIGRP and RIP consumes less. When networks run IPX or AppleTalk, the go-to protocol is EIGRP, as it is the only protocol that can route these packets. RIP effectively beats the other two, as all routing programming and devices support it. For instance, when network contain old UNIX routers, RIP is the best decision.

III. CONCLUSION

As of late, routing protocols has exceptional difficulties what's more, design issues in this Paper; we have surveyed about of different routing protocols parameters are changed for different routing protocols. We reviewed Performance evaluation of various dynamic routing protocols. With particular criteria looks like Jitter, Convergence Time, end to end delay, bandwidth, hop count, and so forth.

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