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COMMUNICATION BETWEEN TWO DIFFERENT PROTOCOLS USING REDISTRIBUTION

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ABSTRACT

The aim of this paper is to allow how different routing protocols communicate with each other in corporate networks. In networking environment routing plays vital role to advertise the network from one network to another network. So here we are going to see the route redistribution for the border router between the OSPF and RIP. Using redistribution technique we have compared the performance of network topology with various attributes such as packet loss, ip full connectivity and latency.

Keywords: Routing, RIP ,OSPF,GNS3,Packet Tracer.

I. INTRODUCTION

There are two types of protocols:

- Interior Gateway Protocols: The protocols which are used within a single routing domain. In this paper two IGPs are used i.e; OSPF and RIP.

o OSPF:

o Open shorted path first is used as the routing protocol for internet Protocol network and it uses link state routing algorithm1. It works within a single autonomous system.

o RIP:

o Routing Information Protocol is a distance vector routing protocol in which routing metrics is important. It takes hopping in consideration and maximum 15 hops are allowed in it and if it extends then packet transmission won't take place because it assumes the distance as infinity2.

- Exterior Gateway Protocols: The protocols which are used to exchange routing information between the autonomous systems3. BGP is only the EGP which is used for exchanging routing information between the IGPs. BGP is connected between two as ospf and rip. It helps to send packets between the two protocols .It chooses the best path for packet transmission on the basis of Administrative distance and load balancing4,5

II. CONFIGRATION & LAYOUT

The figure no. 1 shows the network topology for routing redistribution. There are two autonomous systems:

1. OSPF 1
2. RIP

OSPF1:

The routers in OSPF are :

R2:
Ip addresses:
E2/1: 192.168.28.2
E2/0: 192.168.23.2

R3:

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Ip addresses:
E2/0: 192.168.23.3
E2/1:192.168.34.3

R4:
Ip addresses:
E2/0: 192.168.48.4
E2/1:192.168.34.4

R8:
Ip addresses:
E2/0: 192.168.48.8
E2/1:192.168.28.8
E2/2: 172.168.28.8

RIP:

R5:
Ip addresses:
E2/0: 15.0.0.5
E2/1:57.0.0.5
E2/2:56.0.05

R6:
Ip addresses:
E2/0: 67.0.0.6
E2/2: 56.0.0.6

R7:
Ip addresses:
E2/0: 67.0.0.7
E2/1:57.0.0.7

BGP:

R1:
Ip addresses:
E2/0: 15.0.0.1
E2/2: 172.168.28.1

Each router has given an ip address on the bases of different classes such as class A, B, C and rip has classless ip address6.

Now these Ethernet links should be in up mode because transmission is possible in this mode .
The commands in gns3 used are:

- Configure terminal
- Hostname R1
- Interface Ethernet 2/0
- Ip address 172.168.28.1 255.255.255.0
- No shutdown

These commands are used to for every router in order to define ip address for all.

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Now OSPF is defined in one autonomous system as ospf1

Commands are:
- Configure terminal
- Router ospf1
- Network 0.0.0.0 255.255.255.255 area 0

Each router is defined as ospf and the ip addresses are given of neighbor routers with their wild card mask which is opposite of subnet mask5 .It's very simple in ospf to advertise the network.
Similarly RIP is defined in other autonomous system:

The commands are:
- Router RIP
- Version 2
- Network 57.0.0.0
- Network 56.0.0.0

This is the way in which the neighbors are advertised in each router in rip.
Now the EGP is defines using BGP. In order to define bgp we will take area border router from each autonomous system and they will be connected to backbone area which is common to all.
In BGP configuration it is important to give neighbor id and its bgp number.

The commands are:
- Router bgp 100
- Neighbor 172.16.25.1 remote –as 200

The redistribution of router is the way to advertise the routes with some other mean such as by another routing protocol, static routes7, or directly connected routes. Single routing protocol can be and is important but in big companies, multi-vendor environment multi-protocol routing is required.
Redistribution can be affected by metrics, AD, path cost, classes etc.
The configuration for redistribution is :

In R8 we will redistribute bgp in ospf and ospf in bgp:
Configure terminal
- Router ospf 1
- Redistribute bgp 800 subnets
- Router bgp 800
- Redistribute ospf 1

Similarly in RIP we will distribute bgp in rip and rip in bgp:
- Configure terminal
- Router rip
- Redistribute bgp 500 metric 5
- Router bgp 500
- Redistribute rip

So the redistribution of router protocols is done and we can send packets anywhere throughout the network.

III. RESULTS

The transmission rate of packet before setting up of BGP was zero percent and there was a packet loss in communication between the Protocols. The OSPF couldn't communicate to RIP due to inappropriate IP routes between them but after setting up of BGP the packet transmission rate increased to 80% i.e.
The packets can be transmitted from one router to another irrespective of their different protocol area and configurations. The figure no. 2 & 3 lucidly depicts packet is send from router 2 to router 1 and we are pinging from

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within the domain let say router 5 to router 7 .Its show success rate is 100 % that is all the packets are transmitted without any loss of data and misplacement. Similarly when we are sending packets from RIP protocol to ospf its show 100% success.
From the table no. 1 we can compute the round trip time for each router with respect to R8 is different and maximum time it can take is 52 ms whereas minimum time it can take is 4 ms to transmit the packets.

VI. CONCLUSION

The Border router can be used for redistribution of routing protocols. It has successfully established the communication between the two different routing protocols RIP and OSPF. The above work is an example of communication between the exterior and interior routing protocol. There can be used many areas with different protocols in order to send packets from one end of routing protocol to other end of different protocol but one thing should be taken in consideration is that it should have one common backbone area and it should be connected to all the other non-backbone area and each area should have one border gateway router which will we be connected to border gateway router of backbone area. So by keeping these facts in mind we can increase the rate of transmission of packets and also can decrease the packet loss during communication.

REFERENCES

1. *C.V. Ravikumar, Kala Praveen Bagadi, "Performance analysis of HSRP in provisioning Layer-3 Gateway Redundancy for Corporate Networks." Indian Journal of Science and Technology,2016 may ,Vol. 9 issue 20 .89851*
2. *90005C. Hedrick, Routing Information Protocol, Request for Comments 1058,1998.*
3. *OSPF Redistribution Among Different OSPF Processes, Cisco, January 2006.*
4. *C.V.Ravi kumar, Kala Praveen Bagadi, "Performance analysis of IPv4 to IPv6 Transition Methods." Indian Journal of Science and Technology,2016 may,Vol .9 issue 20,*
5. *Kanaparthy Rama Bramham & Ravi Kumar CV. "Comparison and Optimization of Layer2 and Multilayer switch protocols to implement converged and reliable network." International Journal of Applied Engineering and Research,2015, Vol 10,No. 8, pp. 20139-20154.*
6. *F. B. (Editor), Requirements for IP Version 4 Routers, Request for Comments 1812, 1995.*
7. *F. Le and G. Xie, .On Guidelines for Safe Route Redistributions,. In Proc. ACM SIGCOMM Internet Network Management Workshop, 2007.*