iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 7 **Issue:** VI **Month of publication:** June 2019

DOI: http://doi.org/10.22214/ijraset.2019.6231

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.177
Volume 7 Issue VI, June 2019- Available at www.ijraset.com

Redistribution of Routes and Factor Affecting Redistribution

Ms. Bhoomika Kaushik
Vishveshwarya Group of Institutions Dadri GB.Nagar,Uttar Pradesh,India

Abstract: ***Now a days it is very common to use various routing protocol within a network. Routing protocol work as communication mechanism between the routers, so that routes can be chosen between any two nodes through the information distribute between them. Multiprotocol routing is widely used .Exchanging route information among router with different routing protocol is called Redistribution. But there are certain factor that affects the redistribution process .The ultimate concentration of this research is to understand redistribution, how we perform redistribution among three dynamic routing protocol and factor that affect redistribution.***

Keywords: RIP, EIGRP, OSPF, IGRP, Protocol Metrics, Administrative Distance.

I. INTRODUCTION

Network is the collection of interconnected device in which router is one. Router perform the traffic directing function .Each router maintain a routing table which it exchange with other router to keep routing table updated. Routing protocols work on router which perform the task of exchanging routing information between router.

It is preferable to employ a single routing protocol in an internet work, for easily management and simplicity. But this is not always possible, now making multi-protocol environment (one router using RIP and other using EIGRP) common.

Route redistribution allows routes from one routing protocol to be advertised into another routing protocol. The routing protocol receiving this redistributed route mark the route as external.

The need of redistribution arise because different routing protocol use different metrics alue to decide which path is best like RIP use hop count and EIGRP use bandwidth , delay, reliability and load as metrics value. In such situation if router with RIP protocol exchange its routing information with router with EIGRP then EIGRP router not understand the route information and mark it as external route which is less preferable.

Hence to performe redistribution there is at least one redistribution point need to be exist between the two routing domain. This device will actually run both routing protocols. Thus to performe redistribution.

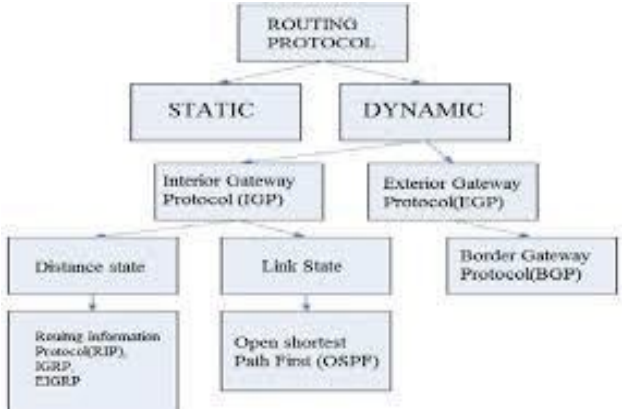


Fig.1. Classification of Routing protocol

Route redistribution is certainly easily realized and cost effective technique. Through using it we can also settle tactical Inernet Communication[1] discussed by Golap Kanti Dey. Routes originating from a routing domain will not redistributed back into that domain. By Route Redistribution v1.14 – Aaron Balchunas. On administration distance you saw how redistribution can potentially cause problems such as below optimal routing loops or slow convergence[3].

In our research work we perform comapative studt about redistribution, need of redistribution and by taking an synario we try to explain how redistribution perfomed amon different routing protocol and factor affecting route redistribution.

©IJRASET: All Rights are Reserved

II. REDISTRIBUTION OF ROUTES

A. *Routing Metrics*

Routing metrics are a consideration when performing route redistribution. Routing protocol uses these metrics to select best route. Except some routing protocol such as IGRP and EIGRP each routing protocol utilizes a unique metric.

Routes redistributed from the injecting protocol must be manually (or globally) stamped with a metric that understood by the receiving protocol.

1) *RIP- Hop count:* For selecting the best path RIP use Hop count as metrics. The hop count is number of routers a packet must cross to reach the destination.
2) *EIGRP-Bandwidth, Delay, Reliability, And load:* Best path is chosen by the route with smallest metrics value calculated from these multiple parameters.
3) *OSPF-Cost:* The cost metrics is calculated based on bandwidth.

When you redistribute route learn from one protocol into another, always take into consideration that metrics play an very important role in redistribution. As we have seen that each protocol uses different metrics to select route.

For ex. RIP metrics is Hop count while IGRP and EIGRP use composite metrics bandwidth, delay, reliability,

Maximum transmission unit (MTU) and load.

When routes are redistributed, you must define a metric that is understandable to the receiving protocol.

There are two ways to do so:

You can define, metric for that specific protocol:



Fig.2. RIP to OSPF Route Redistribution

Router rip

Redistribution ospf 1 metrics 1

Here route of OSPF redistribute to RIP.

In this way we type have to type command for each and every protocol. Or we can use the same metrics as a default for all redistribution using Default-metrics command.

B. *Redistributing into RIP*

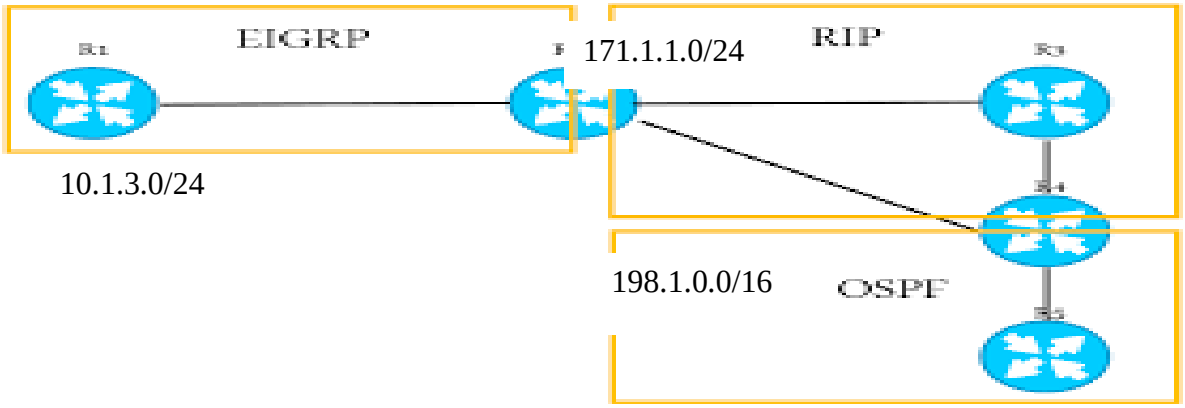


Fig .3. Redistribution of RIP, OSPF and EIGRP

RIP is standardized Distance Vector Routing protocol that, by default, uses Hop count as metrics.

Router R2 is redistribution point between EIGRP and RIP.

1) R2 (config) # router rip
2) R2 (config-router) # network 171.1.1.0
3) R2 (config-router) # redistribute eigrp 1 metric 2

©IJRASET: All Rights are Reserved

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.177
Volume 7 Issue VI, June 2019- Available at www.ijraset.com

Router rip process was enabled. RIP configure to advertise the network of 171.1.1.0. At last rip was configured to redistribute al eigrp route from autonomous system 1 with Hop count metrics 2 to the redistributed route. If metric is not defined then by default it assume to be 0, will not advertise redistributed route.

C. Redistributing into OSPF

OSPF is a standardized Link-state routing protocol that uses cost based on bandwidth as its metrics.

1) R2 (config) # router ospf 1
2) R2 (config-router) # network 198.1.1.0 0.0.255.255 area 0
3) R2 (config-router) # redistribute rip metric 15 subnets

Router ospf process was enabled. OSPF configure to advertise the network of 198.1.1.0. At last ospf was configured to redistribute all rip routes from with metrics 15 to the redistributed route. If metric is not defined then by default 20 metrics applied.

D. Redistributing EIGRP

EIGRP is a cisco-proprietary hybrid routng protocol that, by default ,uses composite of bandwidth and delay as its distance meric.

1) R2(config)# router eigrp 1
2) R2(config-router)# network 10.1.3.0
3) R2(config-router)# redistribute rip metric 1000 100 255 1 1500

EIGRP is configured to redistribute all RIP routes and applying a metric of :1000(bandwidth),100(delay),255(reliability) ,1(load) an 1500(MTU).

III. FACTOR AFFECTING REDISTRIBUTION

A. Same Route Information

In redistribution process route that we learnt from different routing protocol network mentioned as external in the routing table of receiving router. Suppose that one network is running EIGRP and other is running RIP then the boundary router is configured to operate both EIGRP and RIP. Routes that introduce by EIGRP to RIP are external route. It may be possible that RIP side receive route information from EIGRP side as well as from OSPF side then which route RIP side will chose. To solve this problem externally learned route assigned some administrative distance. This is helpful if a route is learned from two different ways so that the most preferred route can be selected.

Such administrative distance can be based on how much you can trust a routing protocol.

Route which have lower administrative distance select over the other.

On the bases of performance analysis done on various protocol it was found that EIGRP is better than RIP and OSPF [1].hence it is better to give a lower administrative distance to EIGRP.

Hence we can say that administrative distances do help in preferring path selection among different routing protocol.

B. Administrative Distance

Administrative distance is the feature that routers use to select best path when there are two or more different routes information available for the same destination from two different routing protocols. Administrative distance shows trustworthiness of source of routing information. Administrative distance is not advertised in routing updates it has local significance.

By default each routing protocol have default administrative distance. The smaller the administrative distance, more reliable the protocol.

Route Source	Default Distance Value
Connected Interface	0
Static Route	1
EIGRP	5
IGRP	100
OSPF	110
RIP	120
Unknown	255

Table 1.Default Administrative Distance Value Table

©IJRASET: All Rights are Reserved

1) If administrative distance is 255,it shows that the source of routing information is not trustworthy hence router does not include the route in its routing table.
2) When we use route redistribution, occasionally you need to modify the administrative distance of protocol so that it takes ascendency .This is done via distance command. Router (config-router) #distance 90
3) In spite of, a change in the administrative distance can lead routing loop.

C. Looping

Another problem that arises due to redistribution of route is looping.

Let we check Figure 4 in which we have two networks: one running RIPv2 among routers R1, R2, and R5, and the other running IGRP among R2, R3, R4, and R5. In this case, as clear in the figure that there are two boundary routers, R2 and R5, that are not directly connected to each other. Addressable network 11.1.1.0/24 attached to R1 is announced to R2 and R5 . Now for the IGRP side, R2, on learning route 11.1.1.0/24, announces to R3 about this external route, and so on. We can see that router R5 learns about 11.1.1.0/24 from R1 (RIPv2 side) and also from R4 (IGRP side).

While from Figure 4, as we can see that it is clearly better to forward traffic from R5 to 11.1.1.0/24 via R1, but it would not do so because the administrative distance to a route learned from IGRP over RIPv2 is smaller. That is, packets arriving at R5 destined for 11.1.1.0/24 would instead be forwarded to R4 for further forwarding to R3, then to R2 and finally to R1. Note that by applying split horizon on the RIPv2 side , a routing loop can be avoided.

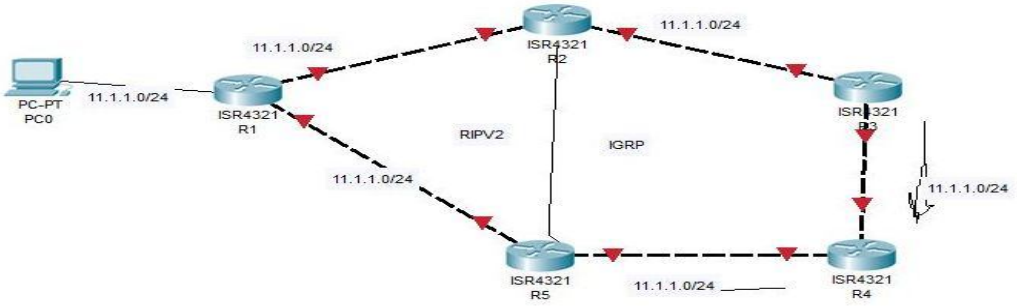


Fig .4.Looping

Routing loops can be extremely harmful for the performance of a network. Split horizon are used in RIP to prevent from routing loops. DUAL algorithm used by EIGRP to check routing loops.

D. Convergence

When routing table of all router found in consistent state it is called in convergence .That's all routers have complete information about the network. But redistribution affect the convergence time. Many time it found that redistribution cause wrong entry in routing table which leave the network in inconsistent state.

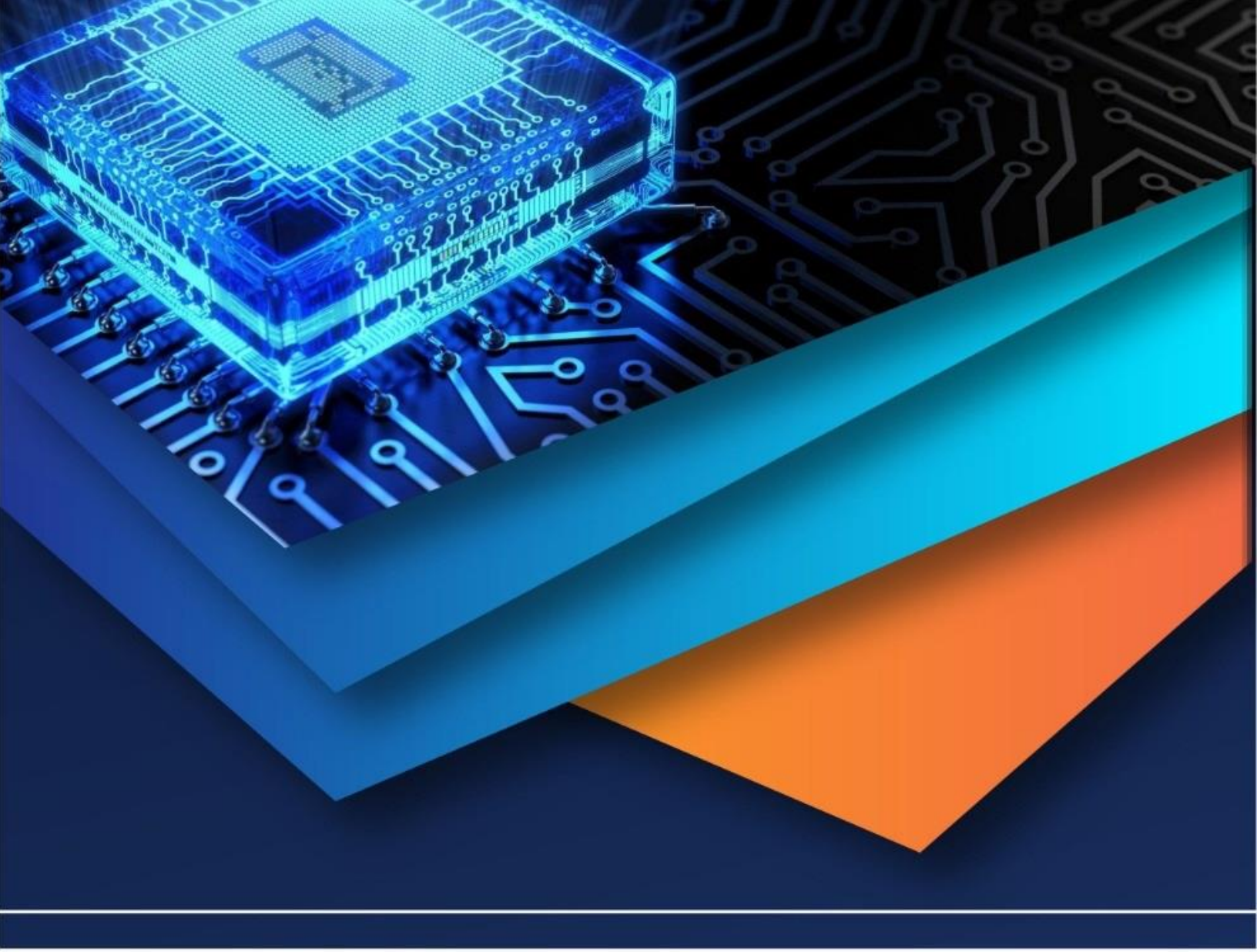
IV. CONCLUSION

The redistribution of routes allows communication among different routing protocol. In this paper we try o understand route redistribution, how it done what command we use and metrics that that different routing protocol use. Default metrics minimize the overhead of typing again and again redistribution command. Administrative distance and problem cause by administrative distance like looping and slow convergence timing.

REFERENCES

[1] Kazi Tanvir Ahmmed,Golap Kanti Dey,Md.Mobasher Ahmed,"Performance analysis and redistribution amongRIPV2,EIGRP & OSPF Routing Protocol .conference paper. November 2015 ,DOI:10.1109/CCIE2015.7399308
[2] Vishesh S1 , Chethan M Yadav2 , Nagaraj Manjunath Moger2 ,Chiranjeevi S2,Akshay Bhat2,Gagan M2 "Route Redistribution-A Case Study" Vol. 6, Issue 6, June 2017.
[3] Route Redistribution v1.14 – Aaron Balchunas.
[4] Mr. Himanshu Sharma ," An Analysis on Redistribution of Routing Protocols" Volume 6 Issue XI, Nov 2018.Redistributing Routing Protocols – Cisco
[5] What is Administrative Distance –Cisco.
[6] Liang Zhijian,"The New Data Exchange method in Different Networks",2010 International conference on educational and information technology(ICEIT 2010),Vol.2,pp.69-72,2010.M. Young, The Technical Writer's Handbook. Mill Valley, CA: University Science, 1989.

©IJRASET: All Rights are Reserved



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)