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Redistribution between RIP and EIGRP Cisco Router Configuration

By Mubashir VP | April 7, 2014 6 Comments

What is **Redistribution between multiple routing protocols**? It is the way how routers exchange routing information if **two or more different protocols are interconnected**. Simply while running multiple routing protocols on same network. For example a company that is running EIGRP and you just bring another company and their network is running OSPF, such conditions are solved by Redistribution. Actually we are going to **MIX different protocols** by redistribution command. One of the issues comes up while redistributing is the possibility of **routing loops**.

Have you done Cisco routing labs for different routing protocols based on my previous articles? Do you have enough knowledge about Routing protocols now? If your answer is YES, let's begin some advanced Cisco router configuration called **Redistribution between multiple routing protocols**. Those who are unfamiliar with different routing protocols, I recommend to check out the following and do some labs using **Packet Tracer** or GNS3.

- Types of Cisco routing Protocols (Overview)
- Cisco Static Routing
- Cisco RIP Configuration – Routing Information Protocol
- Cisco EIGRP Configuration – Enhanced Interior Gateway Routing Protocol
- Cisco OSPF Protocol Configuration – Open Shortest Path First

Well, let's start our Cisco protocol redistribution commands and configuration.

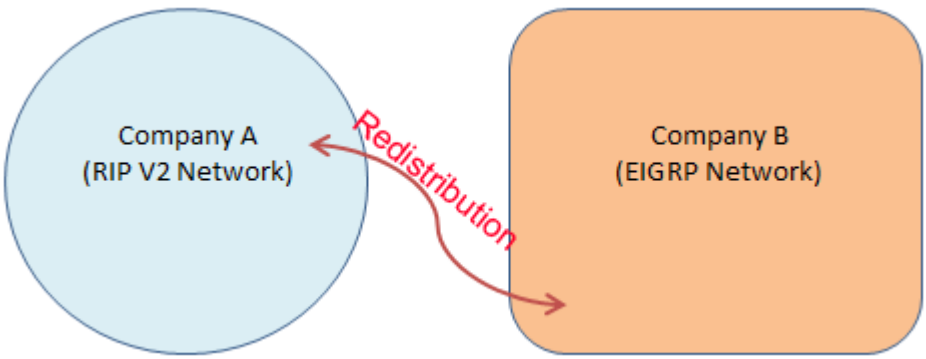
What Actually Redistribution means?

- While you redistribute RIP to EIGRP all routes in the **RIP will be inserted into the EIGRP** database and broadcast throughout the autonomous system as an EIGRP External route.
- The same thoughts apply to RIP when you redistribute EIGRP in to RIP, all the routes from **EIGRP will be injected into the RIP** topology table.
- These routes learned by redistribution process will be marked as "**D EX**" routes in the routing table.

Why we Need Redistribution

Multi-protocol routing is common for many enterprises IP internetworks. They use multi-routing protocol when **company mergers**, several departments managed by various network administrators, and multi-vendor environments etc.

Organizing different routing protocols is often part of a network design too. In any case, **bearing a multiple protocol** atmosphere **makes redistribution a compulsion**.



In a nutshell Redistribution required when we are dealing with a **network having different routing protocols**.

In this article I would like to discuss **Redistribution between RIP and EIGRP in two different autonomous systems**. We will see How to redistribute RIP to EIGRP and vice versa with Packet Tracer Cisco redistribution example scenario.

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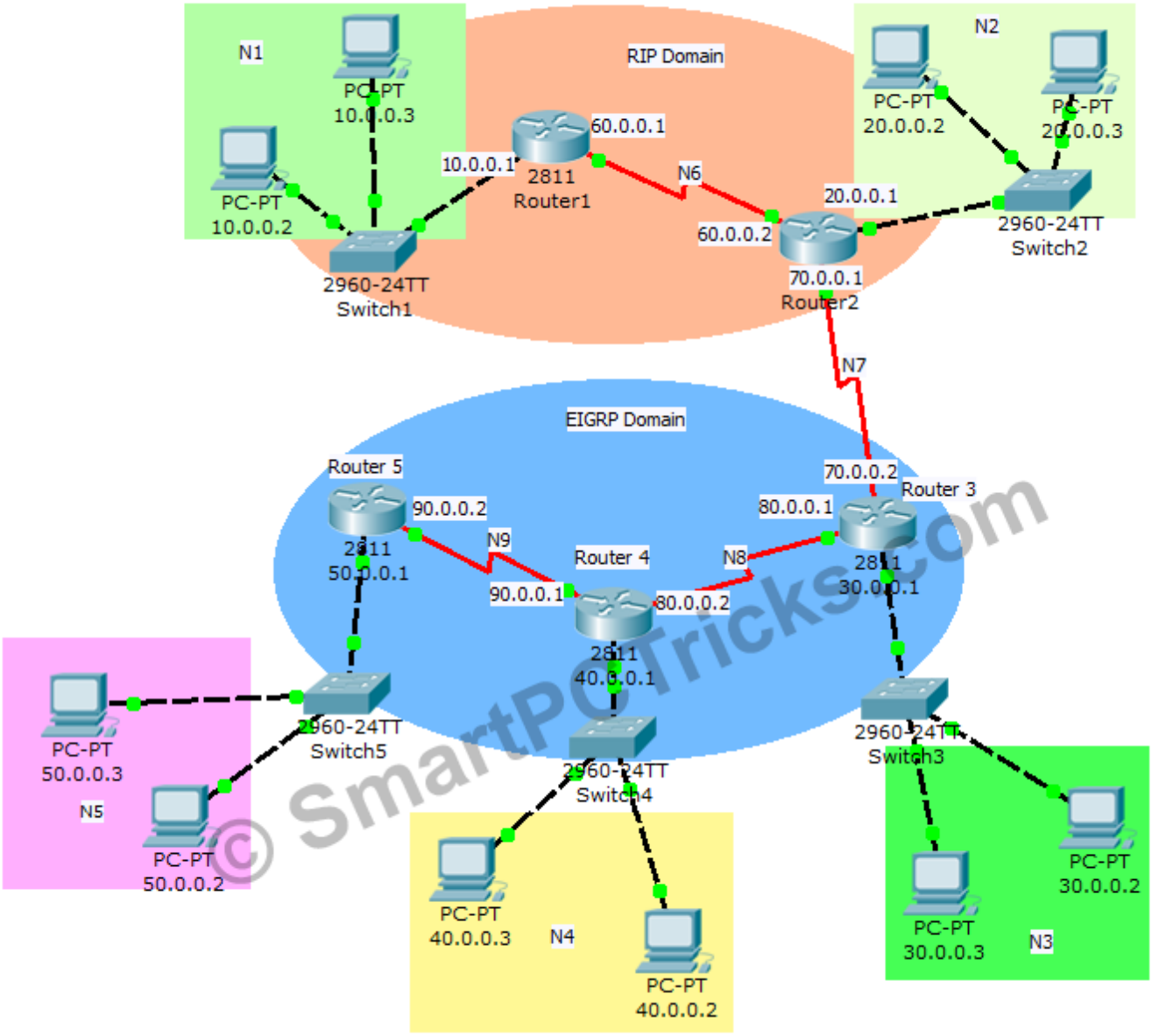
Step 1: Initial Configurations

- Listen to the following network scenario and configure each router for IP address assignment (Not shown here). There are two domains called **RIP Domain** and **EIGRP Domain**.

- Once IP assigned, implement RIP V2 on RIP Domain and enforce EIGRP on EIGRP Domain.



Router 1 RIP V2:

R1#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#router rip
R1(config-router)#version 2
R1(config-router)#network 10.0.0.0
R1(config-router)#network 60.0.0.0
R1(config-router)#no auto-summary
R1(config-router)#exit
R1(config)#
R1#
%SYS-5-CONFIG_I: Configured from console by console

R1#

Since R2 and R3 are the end points of these domains (RIP Domain and EIGRP Domain) implement both protocols on either R2 or R3. In my example I configured R2 with RIP V2 and EIGRP.

Router 2 RIP V2:

```
R2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#router rip
R2(config-router)#version 2
R2(config-router)#network 20.0.0.0
R2(config-router)#network 60.0.0.0
R2(config-router)#network 70.0.0.0
R2(config-router)#no auto-summary
R2(config-router)#exit
R2(config)#
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#
```

Router 2 EIGRP1:

```
R2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#router eigrp 1
R2(config-router)#network 20.0.0.0
R2(config-router)#network 60.0.0.0
R2(config-router)#network 70.0.0.0
R2(config-router)#no auto-summary
R2(config-router)#exit
R2(config)#
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#
```

Router 3 EIGRP1:

```
R2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#router eigrp 1
```

```
R3(config-router)#network 30.0.0.0
R3(config-router)#network 70.0.0.0
R3(config-router)#network 80.0.0.0
R3(config-router)#no auto-summary
R3(config-router)#exit
R3(config)#
R2#
%SYS-5-CONFIG_I: Configured from console by console

R3#
```

Router 4 EIGRP1:

```
R2#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R4(config)#router eigrp 1
R4(config-router)#network 40.0.0.0
R4(config-router)#network 80.0.0.0
R4(config-router)#network 90.0.0.0
R4(config-router)#no auto-summary
R4(config-router)#exit
R4(config)#
R4#
%SYS-5-CONFIG_I: Configured from console by console

R4#
```

Router 5 EIGRP1:

```
R5#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
R5(config)#router eigrp 1
R5(config-router)#network 50.0.0.0
R5(config-router)#network 90.0.0.0
R5(config-router)#no auto-summary
R5(config-router)#exit
R5(config)#
R5#
%SYS-5-CONFIG_I: Configured from console by console

R5#
```

Step 2: Routing Table verification

Now check the routing tables of each router, reveals that R1 don't have information regarding N3, N4, N5, N8 and N9. That indicates only RIP routes are present in the routing table of R1.

Router 1

```
R1#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is not set

C 10.0.0.0/8 is directly connected, FastEthernet0/0
R 20.0.0.0/8 [120/1] via 60.0.0.2, 00:00:09, Serial0/2/0
C 60.0.0.0/8 is directly connected, Serial0/2/0
R 70.0.0.0/8 [120/1] via 60.0.0.2, 00:00:09, Serial0/2/0
R1#
```

Router 2

Router 2 has idea about all networks since it is configured with RIP and EIGRP. We may observe the routes leaned by RIP and EIGRP.

```
R2#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area

N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is not set

R 10.0.0.0/8 [120/1] via 60.0.0.1, 00:00:12, Serial0/0/0
C 20.0.0.0/8 is directly connected, FastEthernet0/0
```

Router 3, 4 and 5 have only EIGRP routing updates in their routing table.

Router 3

```
R3#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is not set

D 20.0.0.0/8 [90/20514560] via 70.0.0.1, 00:04:20, Serial0/0/0
C 30.0.0.0/8 is directly connected, FastEthernet0/0
D 40.0.0.0/8 [90/20514560] via 80.0.0.2, 00:04:20, Serial0/2/0
D 50.0.0.0/8 [90/21026560] via 80.0.0.2, 00:04:20, Serial0/2/0
D 60.0.0.0/8 [90/21024000] via 70.0.0.1, 00:04:20, Serial0/0/0
C 70.0.0.0/8 is directly connected, Serial0/0/0
C 80.0.0.0/8 is directly connected, Serial0/2/0
D 90.0.0.0/8 [90/21024000] via 80.0.0.2, 00:04:20, Serial0/2/0
R3#
```

Router 4

```
R4#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is not set

D 20.0.0.0/8 [90/21026560] via 80.0.0.1, 00:04:51, Serial0/0/0
D 30.0.0.0/8 [90/20514560] via 80.0.0.1, 00:04:51, Serial0/0/0
C 40.0.0.0/8 is directly connected, FastEthernet0/0
D 50.0.0.0/8 [90/20514560] via 90.0.0.2, 00:04:53, Serial0/2/0
D 60.0.0.0/8 [90/21536000] via 80.0.0.1, 00:04:51, Serial0/0/0
D 70.0.0.0/8 [90/21024000] via 80.0.0.1, 00:04:51, Serial0/0/0
C 80.0.0.0/8 is directly connected, Serial0/0/0
```

C 90.0.0.0/8 is directly connected, Serial0/2/0
R4#

Router 5

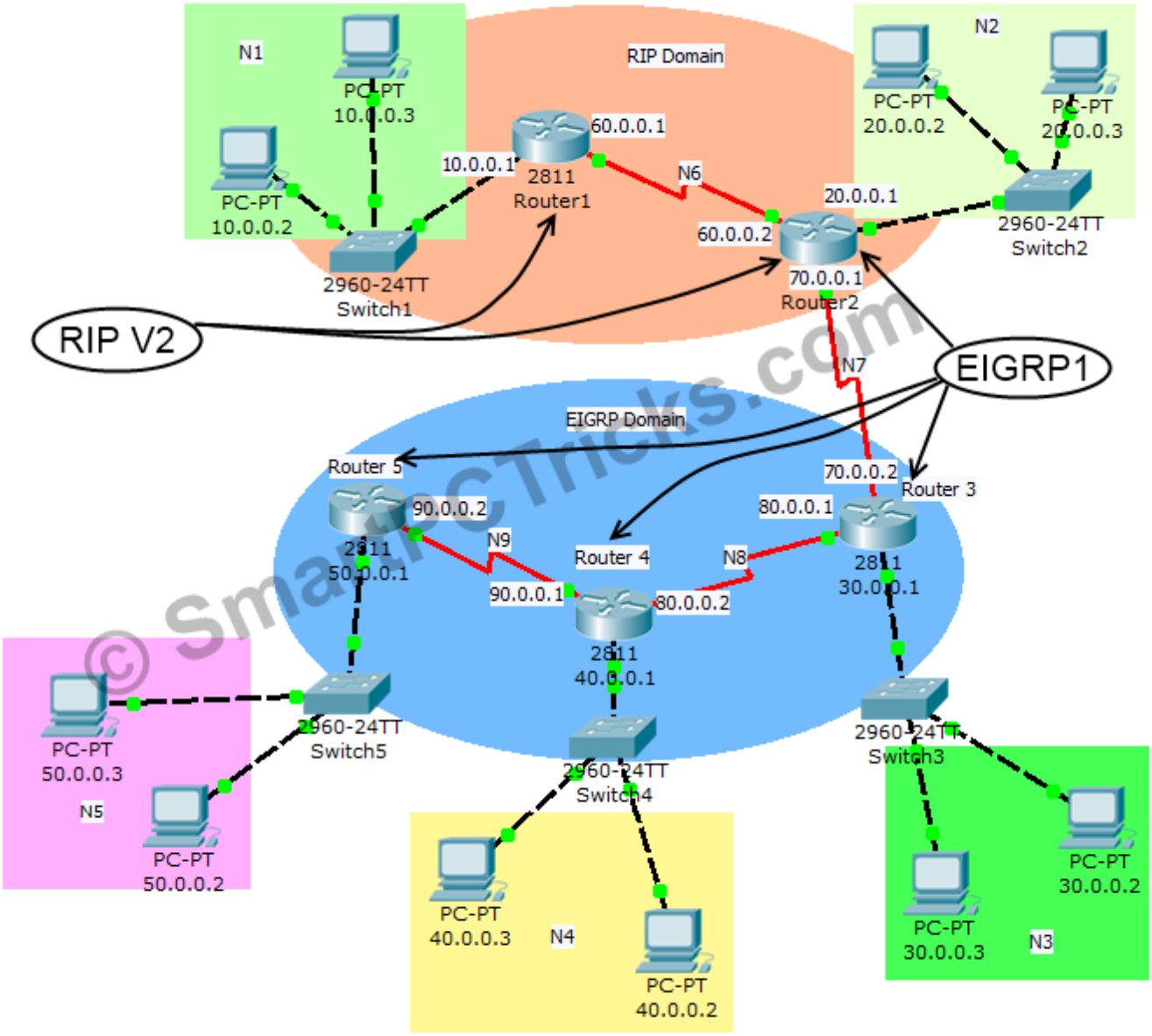
R5#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
* - candidate default, U - per-user static route, o - ODR
P - periodic downloaded static route

Gateway of last resort is not set

D 20.0.0.0/8 [90/21538560] via 90.0.0.1, 00:05:16, Serial0/2/0
D 30.0.0.0/8 [90/21026560] via 90.0.0.1, 00:05:16, Serial0/2/0
D 40.0.0.0/8 [90/20514560] via 90.0.0.1, 00:05:18, Serial0/2/0
C 50.0.0.0/8 is directly connected, FastEthernet0/0
D 60.0.0.0/8 [90/22048000] via 90.0.0.1, 00:05:16, Serial0/2/0
D 70.0.0.0/8 [90/21536000] via 90.0.0.1, 00:05:16, Serial0/2/0
D 80.0.0.0/8 [90/21024000] via 90.0.0.1, 00:05:18, Serial0/2/0
C 90.0.0.0/8 is directly connected, Serial0/2/0
R5#
So **Router 2 running with RIP V2 and EIGRP1, Hence it is aware about all the networks in this topology but other routers not**.

Step 3: Redistribution between RIP and EIGRP Protocols

Following figure shows the current configurations structure in each router. Router 2 has RIP V2 and EIGRP1 so **redistribution done in Router 2**. (*Instead of Router 2 we can also use Router 3 if you configured RIP and EIGRP in R3*)



Now we are gonna to **Inject EIGRP in to RIP V2** using Cisco redistribute EIGRP command **#redistribute eigrp <eigrp number> metric <hope count>**

Redistribute EIGRP to RIP

R2(config)#router rip
R2(config-router)#redistribute eigrp 1 metric 5
R2(config-router)#exit
R2(config)#
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#
Here we should enter manually a metric (Hope count) which I entered here is **5**.

Redistribute RIP V2 to EIGRP

R2(config)#router eigrp 1
R2(config-router)#redistribute rip ?
metric Metric for redistributed routes

R2(config-router)#redistribute rip metric ?
Bandwidth metric in Kbits per second
R2(config-router)#redistribute rip metric 10000 ?
EIGRP delay metric, in 10 microsecond units
R2(config-router)#redistribute rip metric 10000 10 ?
EIGRP reliability metric where 255 is 100% reliable
R2(config-router)#redistribute rip metric 10000 10 255 ?
EIGRP Effective bandwidth metric (Loading) where 255 is 100% loaded
R2(config-router)#redistribute rip metric 10000 10 255 100 ?
EIGRP MTU of the path
R2(config-router)#redistribute rip metric 10000 10 255 100 1000
R2(config)#
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#
As we know **EIGRP metric** is influenced by **Bandwidth, Delay and Reliability**, hence we should specify those parameters for redistribution. Enter '**?**' if you don't know the syntax, Cisco IOS will **suggest** you the **possible values and its meaning**.

If you check the updated routing table of R3 or R4 or R5, you may see **D EX 10.0.0.0/8 [170/21026560] via 80.0.0.1** which means the **network 10.0.0.0 (N1) is learned via External EIGRP (Redistributed from RIP V2)**.

That's all, Redistribution between RIP and EIGR completed!

Hope you guys got the steps I followed to redistribute RIP and EIGRP. Please like our **Facebook page** to get recent updates.

Keep in touch, in next article I will be coming with **Redistribution between RIP and OSPF**. Meanwhile try your own Cisco redistribution lab for various network topologies and get master in Cisco redistribution commands.

Cheers!

Related Posts:

1. **Redistribution between EIGRP and OSPF Cisco Router Configuration**
2. **Redistribution between RIP and OSPF Lab**
3. **Cisco Enhanced Interior Gateway Routing Protocol EIGRP Configuration Guide – How to configure EIGRP**

4. **Cisco RIP Configuration Guide – Dynamic Routing with RIP Version 1 and RIP Version 2**

Category: CCNA Cisco Networking

6 thoughts on “Redistribution between RIP and EIGRP Cisco Router Configuration”

rajani
September 24, 2014

Thanks a lot. This page really worked good for me.

Jaseem Post author
September 24, 2014

Thanks for the feedback Rajani.

CCNA Student
November 4, 2014

Hi,
Nice work, thanks. My question is. How did u calculated the metric values for both Rip and EIGR?
Why did u choose 5 for rip and the other values for EIGRP?
Thanks

sahil kumar chakraborty
August 21, 2015

rip has a maximum hop-count of 15 so you can give anything up to 15. the max values of eigrp metric are also shown if you put a ‘?’ like he/she has shown on the website.

Ashwini
October 16, 2016

Really it has given so nicely…It is very easy to understand ….thanks a lot!!!!!

nikki narendra
November 11, 2016

thanks sir really it is helpful us…….