Cisco router WAN Redundancy / DUAL WAN Failover Using IP SLA

In this article, I will explain how we can configure Cisco routers for WAN redundancy and automatic change routing using IP SLA (Service level agreement).

IP SLA is a feature that enable the network administrators to analyze ip service levels for ip applications and services, and understand the network performance. It measures some parameters such as delay, jitter, packet loss, path, connectivity and other parameters, thus creating accurate statistics and depending on these measurements or statistics, the routers can take an action as we will see in this article.

In our Scenario, we have branch site connected to the main site using two links, one of them will be used as primary link that will carry all the data from the branch to the main site, and backup link (Secondary link) that will be used if the primary link goes down. in this article we will be covering just the icmp-echo feature used by IP SLA.

The idea of this lab is configuring two routes on the branch router R3 to get the the main site -destination network 192.168.40.0/24, and using SLA icmp-echo feature to send icmp-echo to R1. If R3 didn't receive reply from R1, R3 will consider it down and automatically uses the other route or link to reach the main site network.

Configuration Steps:
1-Configuring IP SLA to ping a target : the target is R1 in the main site that has ip 192.168.20.2. This ping that shown in the image below will be sent every 10 second using frequency 10 command. R3 will consider R1
down if it didn't receive reply from it within 6 seconds using timeout 6000 command. It is possible schedule the
SLA operation in different ways but in this article I want to start the ip SLA operation immediately and forever.

```
R3(config)#ip sla 1
R3(config-ip-sla)#icmp-echo 192.168.20.2 source-interface f0/0
R3(config-ip-sla-echo)#frequency 10
R3(config-ip-sla-echo)#timeout 6000
R3(config-ip-sla-echo)#exit
R3(config)#ip sla schedule 1 start-time now life forever
R3(config)#
```

2-Track the state of the IP SLA Reachability: the “track state” will be down only in case of a ICMP timeout
using track 1 ip sla 1 reachability command.

```
R3(config)#track 10 ip sla 1 reachability
R3(config-track)#
```

By using the above command, we define an object that tracks the SLA probe (track object number is 10 in this
example). This can be accomplished by using the IOS Track Object as shown above. The above command will
track the state of the IP SLA operation. If there are no ping responses from the next-hop IP -defined in sla 1-
the track will go down and it will come up When the ip sla operation starts receiving ping response. To show
the state of the Reachability use sh track command.

```
R3#sh track
Track 10
   IP SLA 1 reachability
   Reachability is Down
      4 changes, last change 00:05:21
   Latest operation return code: Timeout
   Tracked by:
      STATIC-IP-Routing 0
R3#
```

3- Define the tracked route : add the track statement to the route pointing to R1 , The track number specifies
that the static route will be installed only if the state of the configured track object is up. Hence if the track
status is down the secondary route will be used to forward all the traffic.

```
R3(config)#ip route 192.168.40.0 255.255.255.0 192.168.20.2 track 10
R3(config)#ip route 192.168.40.0 255.255.255.0 192.168.20.2 5
R3(config)#
```

4- verify your configuration : The commands in the image below are issued after making sure that all the
links (primary and secondary is up) between the branch and the main site. The image below shows that R3
can ping to R1, the track state is up as shown in the show track command, and the router uses R1 IP address 192.168.20.2 as a next hop to reach the main site destination network 192.168.40.0/24.

Now, I removed the link between R3 and R1. Let's see what happened in R3. As you see in the image below, R3 changes the route automatically to R2 IP address 192.168.30.2.
More explanation about the configuration, watch the following simple and short video
http://adf.ly/1B9z2w
https://youtu.be/x3xZhbrX7Ww

To download the configuration file, click on the following link
http://adf.ly/1BA0ki

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