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1. Introduction

1.1 Overview

This document contains information regarding the configuration and use of DMVPN with RIP.

This guide has been written for use by technically competent personnel with a good understanding of the communications technologies used in the product, and of the requirements for their specific application.

1.2 Compatibility

This application note applies to:

Models Shown: NR500 series.

Firmware Version: devel(6fe359a) or newer

Other Compatible Models: None

1.3 Version

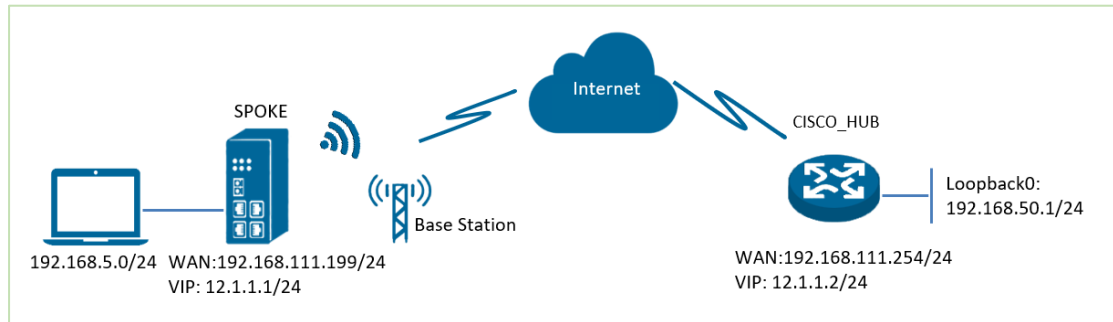
Updates between document versions are cumulative. Therefore, the latest document will include all the content of previous versions.

Release Date	Doc. Version	Firmware Version	Change Description
2018/12/07	V1.0.0	devel(6fe359a)	First released

1.4 Corrections

Appreciate for corrections or rectifications to this application note, and if any request for new application notes please email to: support@navigateworx.com

2. Topology



1. NR500 Pro runs as DMVPN spoke with any kind of IP, which can ping DMVPN hub successfully.
2. CISCO router runs as DMVPN hub with a static public IP.
3. The tunnel is established between spoke and hub, the subnet can PING each other successfully.
4. Both NR500 Pro and CISCO runs RIP.

3. Configuration

3.1 HUB Configuration

1. The configuration of **Hub on CISCO** like below:

=====

```
cisco2811#show running-config
Building configuration...
version 12.4
hostname cisco2811
ip address-pool local
no ipv6 cef
!
username cisco password 0 cisco
!
crypto isakmp policy 10
  encr 3des
  hash md5
  authentication pre-share
  group 2
crypto isakmp key 6 cisco address 0.0.0.0 0.0.0.0
!
crypto ipsec transform-set DMVPN esp-3des esp-sha-hmac
  mode transport
!
crypto ipsec profile DMVPN-PROFILE
  set transform-set DMVPN

interface Loopback0
  ip address 192.168.50.1 255.255.255.0
!

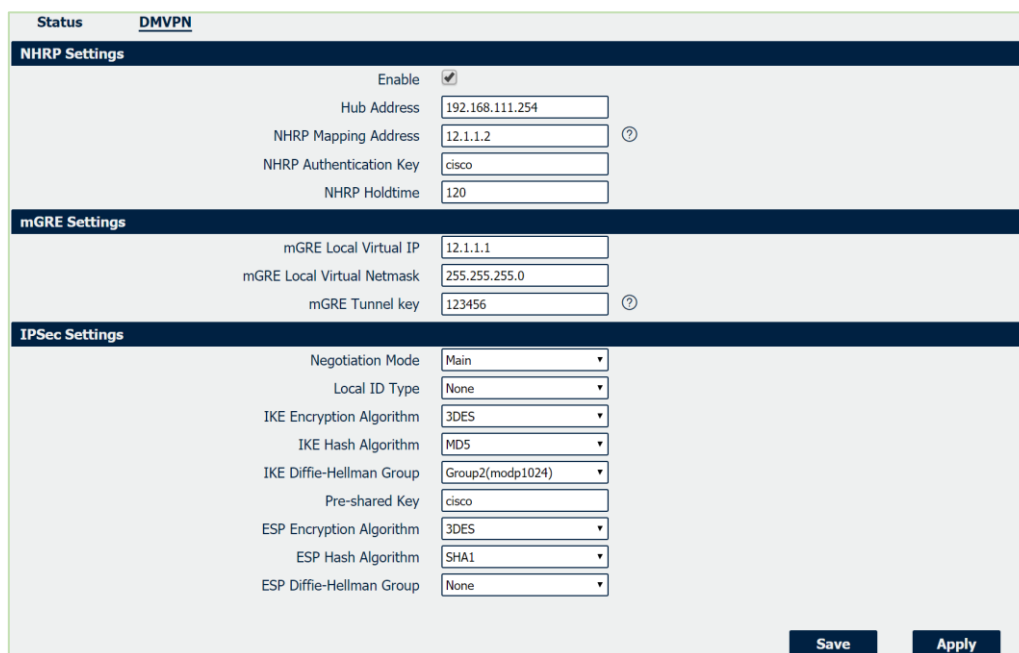
interface Tunnel1
  ip address 12.1.1.2 255.255.255.0
  no ip redirects
  ip nhrp authentication cisco
  ip nhrp map multicast dynamic
  ip nhrp network-id 3
  ip nhrp holdtime 120
  ip nhrp redirect
  no ip split-horizon
```

```
tunnel source 192.168.111.254
tunnel mode gre multipoint
tunnel key 123456
tunnel protection ipsec profile DMVPN-PROFILE
!
interface FastEthernet0/0
ip address 192.168.111.254 255.255.255.0
ip nat outside
ip nat enable
ip virtual-reassembly
duplex full
speed auto
no mop enabled
!
interface FastEthernet0/1
ip address 192.168.6.3 255.255.255.0
ip nat inside
ip nat enable
ip virtual-reassembly
duplex auto
speed auto
!
router rip
version 2
network 12.0.0.0
network 192.168.50.0
no auto-summary
!
ip forward-protocol nd
no ip http server
no ip http secure-server
!

ip nat inside source list 10 interface FastEthernet0/0 overload
!
access-list 10 permit 192.168.6.0 0.0.0.255
snmp-server community public RO
cisco2811#
=====
```

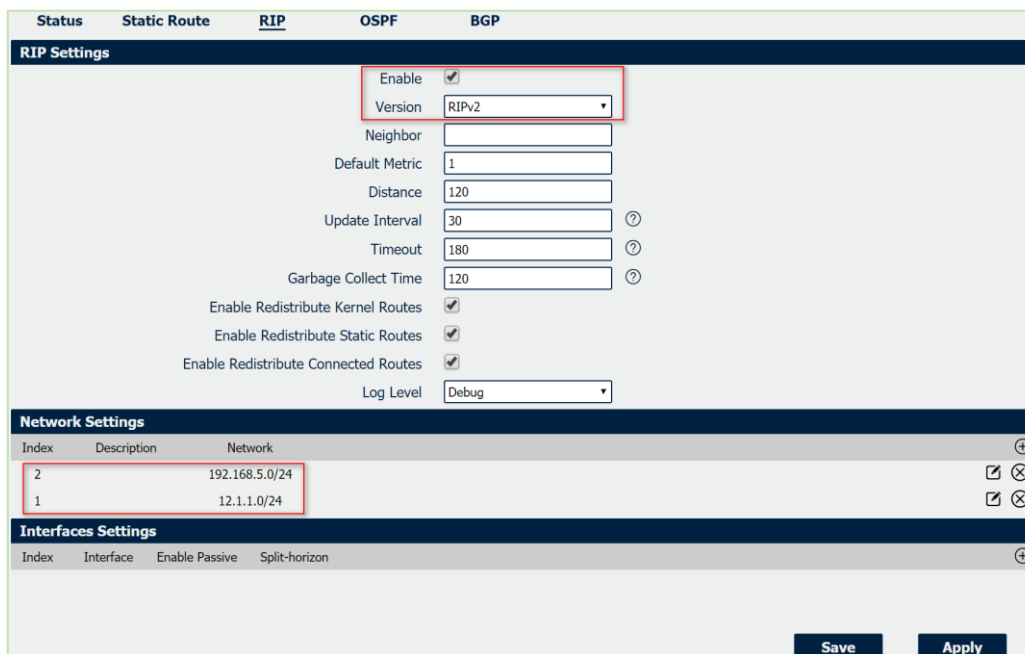
3.2 Spoke Configuration

1. Go to **VPN>DMVPN**, enable DMVPN and configure DMVPN as below picture.

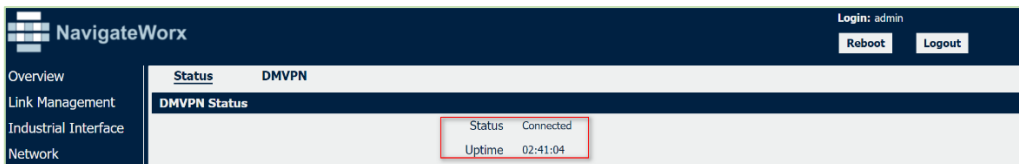


2. Click Save>Apply.

3. Go to **Network>Route>RIP**, enable RIP and configure RIP as below picture.



4. Route had connected to CISCO HUB. Go to **VPN>DMVPN>Status** to check the connection status.



The screenshot shows the 'DMVPN Status' page in the NavigateWorx interface. The status is 'Connected' and the uptime is '02:41:04'. The page includes a sidebar with navigation options like Overview, Link Management, Industrial Interface, and Network. At the top right, there are 'Reboot' and 'Logout' buttons.

4. Route Table

1. Route Table on CISCO HUB for reference.

```

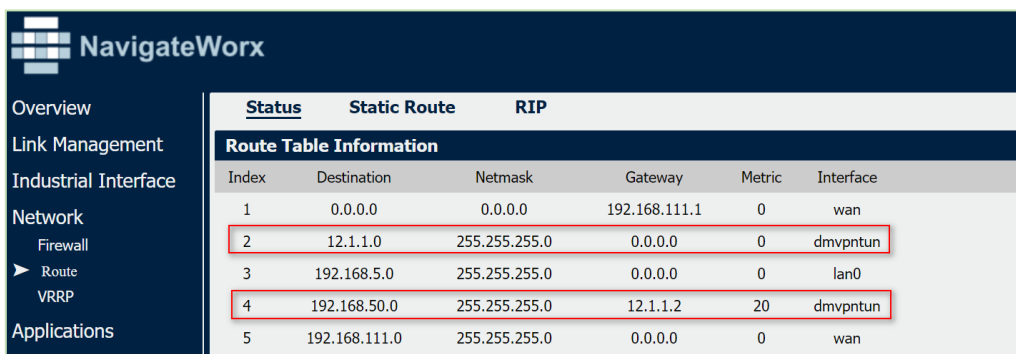
cisco2811#show ip route
Codes: C - connected, S - static, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, su - IS-IS summary, 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 192.168.111.1 to network 0.0.0.0

C    192.168.88.0/24 is directly connected, Loopback3
C    192.168.111.0/24 is directly connected, FastEthernet0/0
     172.16.0.0/24 is subnetted, 2 subnets
C      172.16.1.0 is directly connected, Loopback1
C      172.16.2.0 is directly connected, Loopback2
R    192.168.5.0/24 [120/1] via 12.1.1.1, 00:00:17, Tunnel1
     12.0.0.0/24 is subnetted, 1 subnets
C      12.1.1.0 is directly connected, Tunnel1
C    192.168.50.0/24 is directly connected, Loopback0
S*   0.0.0.0/0 [1/0] via 192.168.111.1
cisco2811#

```

2. Route Table on SPOKE for reference.



The screenshot shows the 'Route Table Information' table in the NavigateWorx interface. The table has columns for Index, Destination, Netmask, Gateway, Metric, and Interface. Three rows are highlighted with red boxes: index 2 (12.1.1.0), index 4 (192.168.50.0), and index 5 (192.168.111.0).

Index	Destination	Netmask	Gateway	Metric	Interface
1	0.0.0.0	0.0.0.0	192.168.111.1	0	wan
2	12.1.1.0	255.255.255.0	0.0.0.0	0	dmpntun
3	192.168.5.0	255.255.255.0	0.0.0.0	0	lan0
4	192.168.50.0	255.255.255.0	12.1.1.2	20	dmpntun
5	192.168.111.0	255.255.255.0	0.0.0.0	0	wan

5. Testing

1. Enable CMD and Ping from end device of SPOKE to subnet of CISCO HUB.

```
Administrator: Command Prompt
C:\Users\Administrator>
C:\Users\Administrator>ping 192.168.50.1

Pinging 192.168.50.1 with 32 bytes of data:
Reply from 192.168.50.1: bytes=32 time=4ms TTL=254
Reply from 192.168.50.1: bytes=32 time=4ms TTL=254
Reply from 192.168.50.1: bytes=32 time=4ms TTL=254
Reply from 192.168.50.1: bytes=32 time=4ms TTL=254

Ping statistics for 192.168.50.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 4ms, Maximum = 4ms, Average = 4ms

C:\Users\Administrator>
```

2. Ping from CISCO HUB to end device of SPOKE.

```
cisco2811#ping 192.168.5.2 source 192.168.50.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.5.2, timeout is 2 seconds:
Packet sent with a source address of 192.168.50.1
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 4/4/8 ms
cisco2811#
```

3. Test successfully.