



## Multi-VRF for NEMO

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Multi-VRF NEMO feature enables user privacy and supports overlapping IP addresses on a network mobility (NEMO) mobile router so that the devices or subnets connected to the NEMO mobile router seamlessly access multiple enterprise virtual routing and forwarding instances (VRFs), or multiple separate services across an access point name (APN).

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## Finding Feature Information

Your software release may not support all the features documented in this module. For the latest caveats and feature information, see [Bug Search Tool](#) and the release notes for your platform and software release. To find information about the features documented in this module, and to see a list of the releases in which each feature is supported, see the feature information table.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to [www.cisco.com/go/cfn](http://www.cisco.com/go/cfn). An account on Cisco.com is not required.

## Information About Multi-VRF NEMO



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**Note** NEMO Mobile IP does not work in Cisco IOS XE Everest16.4.1.

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## Dynamic Mobile Network Routing

Dynamic Mobile Network Routing (DMNR) is a network-based, mobile technology that provides dynamic routing, and support for mobile or stationary enterprise routers in primary wireless access or automatic wireless backup configurations. DMNR enables integration between wireless and wireline enterprise services that is, third generation (3G) Wireless WAN, by making use of the Mobile IPv4 network mobility (NEMO) protocol.

The mobile router is used with DMNR service for providing backup communications over Code Division Multiple Access (CDMA) or Evolution-Data Optimized (EVDO) Access and mobile private networks between an enterprise branch office and a data center connected to a IP MPLS/VPN network.

Multi-VRF NEMO feature enables privacy and supports overlapping IP addresses on a network mobility (NEMO) mobile router so that the devices or subnets connected to the NEMO mobile router seamlessly access multiple enterprise virtual routing and forwarding instances (VRFs), or multiple separate services across an access point name (APN).

## Per-VRF Tunnel Template Support

Tunnel template support is available in this feature. A separate tunnel template is configured on a mobile router (MR) for each virtual routing and forwarding (VRF) instance, and the same tunnel template is applied on the tunnel created specifically for each VRF instance. The template is configured before the network mobility (NEMO) call is created.

# How to Configure Multi-VRF NEMO

## Defining VRF Instances

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **vrf definition** *vrf-name*
4. **address-family ipv4**
5. **address-family ipv4**
6. **exit**
7. Repeat the steps 3 through 6 to define another VRF instance. You can repeat these steps as many times as the required number of VRF instances.

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b> Device> enable	Enables privileged EXEC mode. • Enter your password if prompted.
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b> Device> configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>vrf definition</b> <i>vrf-name</i> <b>Example:</b> Device (config)# vrf definition red1	Enters IP VRF configuration mode for defining a VRF routing table instance.

	Command or Action	Purpose
<b>Step 4</b>	<b>address-family ipv4</b> <b>Example:</b> Device (config-vrf)# address-family ipv4	Enters VRF address-family configuration mode to configure a routing session using standard IPv4 address prefixes.
<b>Step 5</b>	<b>address-family ipv4</b> <b>Example:</b> Device (config-vrf-af)# exit-address-family	Exits VRF address-family configuration mode and enters IP VRF configuration mode.
<b>Step 6</b>	<b>exit</b> <b>Example:</b> Device (config-vrf)# exit	Exits IP VRF configuration mode and enters global configuration mode.
<b>Step 7</b>	Repeat the steps 3 through 6 to define another VRF instance. You can repeat these steps as many times as the required number of VRF instances.	—

## Configuring Multi-VRF for NEMO

### Before you begin

### SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ip mobile router**
4. **address address mask**
5. **address address mask**
6. **home-agent ip-address [priority level]**
7. **mobile-network interface interface-number**
8. **mobile-network interface interface-number**
9. **vrf-routing vrf-name**
10. **vrf-routing vrf-name**
11. **template tunnel interface-number [vrf vrf-name]**
12. **template tunnel interface-number [vrf vrf-name]**
13. **end**

### DETAILED STEPS

	Command or Action	Purpose
<b>Step 1</b>	<b>enable</b> <b>Example:</b> Device> enable	Enables privileged EXEC mode. <ul style="list-style-type: none"> <li>• Enter your password if prompted.</li> </ul>

	Command or Action	Purpose
<b>Step 2</b>	<b>configure terminal</b> <b>Example:</b> Device> configure terminal	Enters global configuration mode.
<b>Step 3</b>	<b>ip mobile router</b> <b>Example:</b> Device> ip mobile router	Enables the mobile router and enters mobile router configuration mode.
<b>Step 4</b>	<b>address address mask</b> <b>Example:</b> Device (mobile-router)# ip mobile router	Enables the mobile router and enters mobile router configuration mode.
<b>Step 5</b>	<b>address address mask</b> <b>Example:</b> Device (mobile-router)# address 10.2.2.2 255.255.255.255	Sets an IP address for the tunnel source interface.
<b>Step 6</b>	<b>home-agent ip-address [priority level]</b> <b>Example:</b> Device (mobile-router)# home-agent 10.1.1.1	Specifies the home agent that the mobile router uses during registration.
<b>Step 7</b>	<b>mobile-network interface interface-number</b> <b>Example:</b> Device (mobile-router)# mobile-network Ethernet 0/3	Specifies the mobile router interface that is connected to the dynamic mobile network.
<b>Step 8</b>	<b>mobile-network interface interface-number</b> <b>Example:</b> Device (mobile-router)# mobile-network Ethernet 1/1	Specifies the mobile router interface that is connected to the dynamic mobile network.
<b>Step 9</b>	<b>vrf-routing vrf-name</b> <b>Example:</b> Device (mobile-router)# vrf-routing red1	Enables the mobile router carry the network prefixes belonging to a VRF in the registration request message.
<b>Step 10</b>	<b>vrf-routing vrf-name</b> <b>Example:</b> Device (mobile-router)# vrf-routing blue1	Enables the mobile router carry the network prefixes belonging to a VRF in the registration request message.
<b>Step 11</b>	<b>template tunnel interface-number [vrf vrf-name]</b> <b>Example:</b> Device (mobile-router)# template tunnel 200 vrf red1	Applies a tunnel template to tunnels brought up in a specific VRF or global VRF at the mobile router.

	Command or Action	Purpose
Step 12	<b>template tunnel</b> <i>interface-number</i> [ <b>vrf</b> <i>vrf-name</i> ] <b>Example:</b> Device (mobile-router)# <b>template tunnel</b> 200 vrf blue1	Applies a tunnel template to tunnels brought up in a specific VRF or global VRF at the mobile router.
Step 13	<b>end</b> <b>Example:</b> Device (mobile-router)# <b>end</b>	Exits the mobile router configuration and returns to privileged EXEC mode.

## Configuration Examples for Multi-VRF for NEMO

### Example: Defining VRF Instances

```
Device> enable
Device# configure terminal
Device(config)# vrf definition red1
Device(config-vrf)# address-family ipv4
Device(config-vrf-af)# exit-address-family
Device(config-vrf)# exit
Device(config)# vrf definition red1
Device(config-vrf)# address-family ipv4
Device(config-vrf-af)# exit-address-family
Device(config-vrf)# end
```

### Example: Configuring Multi-VRF for NEMO

```
Device> enable
Device# configure terminal
Device(config)# ip mobile router
Device(mobile-router)# ip mobile router
Device(mobile-router)# home-agent 10.1.1.1
Device(mobile-router)# mobile-network Ethernet 0/3
Device(mobile-router)# mobile-network Ethernet 1/1
Device(mobile-router)# vrf-routing red1
Device(mobile-router)# vrf-routing blue1
Device(mobile-router)# template tunnel 200 vrf red1
Device(mobile-router)# template tunnel 200 vrf blue1
Device(mobile-router)# end
```

## Additional References

### Related Documents

Related Topic	Document Title
Cisco IOS commands	<a href="#">Cisco IOS Master Command List, All Releases</a>

Related Topic	Document Title
IP Mobility commands	<a href="#">Cisco IOS IP Mobility Command Reference</a>

### Technical Assistance

Description	Link
<p>The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies.</p> <p>To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds.</p> <p>Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.</p>	<a href="http://www.cisco.com/support">http://www.cisco.com/support</a>

## Feature Information for Multi-VRF for NEMO

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

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**Table 1: Feature Information for Multi-VRF for NEMO**

Feature Name	Releases	Feature Information
Multi-VRF for NEMO	15.4(3)T	<p>The Multi-VRF NEMO feature enables privacy and supports overlapping IP addresses on a network mobility (NEMO) mobile router so that the devices or subnets connected to the NEMO mobile router seamlessly access multiple enterprise virtual routing and forwarding instances (VRF)s, or multiple separate services across an access point name (APN).</p> <p>The following commands were introduced or modified: <b>template tunnel</b>, <b>vrf-routing</b>, <b>test ospfv3 interface</b>.</p>