# Configuring Multicast Interoperation with N7K-F132-15 Modules

This appendix describes how multicasting interoperates in a chassis that contains both M Series and N7K-F132-15 modules.


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## Information About Multicast Interoperation

Beginning with Cisco NX-OS Release 5.1, you can add an N7K-F132-15 module, which is a Layer 2-only module, into the Cisco Nexus 7000 Series chassis. You can add this module to a chassis that already contains M-Series modules to provide multicasting in a chassis that contains both N7K-F132-15 and M-Series modules.

## Multicast Interoperation with N7K-F132-15 and M-Series Modules

**Note** You must install an M-Series module in the Cisco Nexus 7000 Series chassis to run Layer 3 routing and multicasting with the N7K-F132-15 module because you must have interfaces from both the M-Series and the N7K-F132-15 modules in the same virtual device context (VDC). See the *Cisco Nexus 7000 Series Virtual Device Context Configuration Guide* for more information on VDCs.

Layer 3 routing and multicasting come up automatically when you have an M-Series module installed in the chassis with the N7K-F132-15 module. You can position a chassis with both N7K-F132-15 and M-Series modules at the boundary between the Layer 2 and Layer 3 networks.

You must configure a VLAN interface for each VLAN on the N7K-F132-15 module that you want to use the proxy-routing functionality in a chassis that contains both N7K-F132-15 and M-Series modules. See the *Cisco Nexus 7000 Series Interfaces Configuration Guide* for information on configuring VLAN interfaces.

By default, all of the physical interfaces on the M-Series modules in the VDC become proxy routing ports for the VLANs that are configured with VLAN interfaces on the Layer 2-only N7K-F132-15 module in the same VDC. The physical interfaces on the M-Series module can be administratively down and they still pass traffic as proxy routers.

Packets that enter an interface on the N7K-F132-15 module are automatically forwarded to one of the interfaces on the M-Series modules in the same VDC to be routed. The interface on the M-Series module also performs egress replication for Layer 3 multicast packets that enter an interface on the N7K-F132-15 module in the same VDC. See the *Cisco Nexus 7000 Series NX-OS Unicast Routing Configuration Guide* for additional information about the routing interoperation with the N7K-F132-15 module.

You can specify which interfaces on the M-Series modules in the VDC where you want to perform the egress replication of VLAN interfaces for Layer 3 multicast packets. For multicast egress replication, the system automatically rebalances all the VLAN interfaces among all the available M-Series proxy routing interfaces. You can specify automatic or manual rebalancing among the proxy multicast replicators. If you specify manual rebalancing, you trigger a rebalance by entering a command. This command is useful when you are inserting or removing modules.

**Note** When you configure manual egress multicast replication load balancing and enter the rebalancing command, that command is not part of the configuration. It is not included in the commands that are copied when you enter the **copy running-config startup-config** command.

## Virtualization Support

You must have interfaces from both the M-Series and the N7K-F132-15 modules in the same VDC.

See the *Cisco Nexus 7000 Series Virtual Device Context Configuration Guide* for more information about VDCs.

## High Availability

For information about high availability, see the *Cisco Nexus 7000 Series NX-OS High Availability and Redundancy Guide*.

# Prerequisites for Multicast Interoperation

For multicast interoperation, you must have at least one module of the following series in the Cisco Nexus 7000 Series chassis, as well as a valid license installed:

- M Series
- N7K-F132-15

# Guidelines and Limitations

Multicasting requires you to have interfaces from both the M-Series and the N7K-F132-15 modules in the same VDC.

# Configuring Layer 3 Multicast Using a Mixed Chassis

You can configure a Layer 3 gateway in a chassis with N7K-F132-15 and M-Series modules, by using the proxy routing functionality. You enable routing on a specific VLAN by configuring a VLAN interface. See the *Cisco Nexus 7000 Series NX-OS Interfaces Configuration Guide* for more information about Layer 3 routing and VLAN interfaces.

By default, Layer 3 routing and multicasting come up automatically when you have an M-Series module installed in the chassis with the N7K-F132-15 module. Layer 3 routing, multicasting, and load balancing among the available M-Series works by default using proxy routing on the M-Series modules.

Optionally, you can specify which physical interfaces on the M-Series modules that you want to use for egress multicast replication, as well as forcing rebalancing.

### Before you begin

You must configure a VLAN interface for each VLAN on the N7K-F132-15 module where you want to use the proxy-routing functionality in a mixed chassis.

You must have interfaces from both the M-Series and the N7K-F132-15 modules in the same VDC.

If you remove an interface from the VDC and then enter this command, the removed interface only display when you reload the VDC.

### Procedure

| | Command or Action | Purpose |
|---|---|---|
| **Step 1** | **config t**<br>**Example:**<br>`switch# config t`<br>`switch(config)#` | Enters global configuration mode. |
| **Step 2** | **hardware proxy layer-3 replication** {**use** \| **exclude**} {**module** *mod-number* \| **interface** *slot/port*} [**module-type** *f1*]<br>**Example:**<br>`switch(config)# hardware proxy layer-3 replication exclude interface ethernet 2/1-16, ethernet 3/1, ethernet 4/1-2` | Configures specific modules and physical interfaces on the M-Series module to provide egress proxy replication of Layer 3 multicast packets on the N7K-F132-15 module. |
| **Step 3** | **hardware proxy layer-3 replication rebalance-mode** { **auto** \| **manual**}<br>**Example:** | Configures the load balancing among the proxy routing replication interfaces. When you choose **auto**, the switch automatically rebalances the |

| | Command or Action | Purpose |
|---|---|---|
| | `switch(config)# hardware proxy layer-3 replication rebalance-mode auto` | configured VLAN interface multicast replication traffic load among all the M-Series replicators. The default value is manual.<br>**Note**<br>In the *manual* mode, the switch automatically balances all traffic among the available proxy routing interfaces on the M-Series modules in the chassis when you first start up the switch. |
| **Step 4** | **hardware proxy layer-3 replication trigger rebalance**<br>**Example:**<br>`switch(config)# hardware proxy layer-3 replication trigger rebalance` | When you configure **manual** again in Step 3, use this command to trigger one-time load balancing among all the proxy routing multicast replication interfaces. This command is not effective if you have configured auto in Step 3.<br>**Note**<br>This command is not saved in the configuration; it is a one-time event. |
| **Step 5** | **exit**<br>**Example:**<br>`switch(config)# exit`<br>`switch#` | Exits configuration mode. |
| **Step 6** | **show hardware proxy layer-3 detail**<br>**Example:**<br>`switch# show hardware proxy layer-3 detail` | (Optional) Displays the information on the proxy Layer-3 functionality. |
| **Step 7** | **copy running-config startup-config**<br>**Example:**<br>`switch# copy running-config startup-config` | (Optional) Copies the running configuration to the startup configuration. |

### Example

This example shows how to specify certain physical interfaces on the N7K-M Series modules to perform egress multicast replication for VLANs on the N7K-F132-15 module in a mixed chassis and to trigger a rebalance:

```
switch# config t
switch(config)# hardware proxy layer-3 replication exclude interface ethernet 2/1-16, 3/1,
 4/1-2
switch(config)# hardware proxy layer-3 replication rebalance mode manual
switch(config)# hardware proxy layer-3 replication trigger rebalance
switch(config)#
```

# Verifying the Multicast Configuration

To display multicast configuration information, perform one of the following tasks:

| Command | Description |
|---|---|
| **show hardware proxy layer-3 detail** | Displays information about the Layer 3 proxy routing functionality in a mixed chassis with both M-series and N7K-F132-15 modules. |
| **show hardware proxy layer-3 counters** {**brief** \| **detail**} | Displays information about the number of packets that are sent by the N7K-F132-15 modules to each of the M-Series modules for proxy forwarding.<br>**Note**<br>Enter the **clear hardware proxy layer-3 counters** command to reset the counters to 0. |

# Feature History for Multicast Interoperation

*Table 1: Feature History for Multicast Interoperation*

| Feature Name | Releases | Feature Information |
|---|---|---|
| Multicast interoperation between F-Series and M-Series modules in the Cisco Nexus 7000 Series chassis | 5.1(1) | This feature, along with the N7K-F132-15 modu introduced in this release. |