



## Managing Advanced Features

Cisco MDS 9000 Family switches support advanced features, such as world wide names, domains, and name server. The Fabric Manager allows you to configure these features on multiple Cisco 9000 switches. The Device Manager allows you to configure these advanced features on a single Cisco 9000 switch. This chapter describes how to configure these advanced features using the Fabric Manager and Device Manager.



### Note

For information about these advanced features and configuring them using the command-line interface (CLI), refer to the *Cisco 9000 Family Configuration Guide*.

This chapter includes the following information:

- [Managing World Wide Names, page 11-1](#)
- [Managing Domain Parameters, page 11-3](#)
- [Configuring the Name Server, page 11-10](#)
- [Viewing RSCN Information, page 11-15](#)
- [Configuring Timers, page 11-16](#)
- [Configuring Virtual Routing Redundancy Protocol \(VRRP\), page 11-18](#)

## Managing World Wide Names

Each port on a Cisco MDS 9000 Family switch is uniquely identified by its world wide names (WWNs), which include the switch MAC address and an identifier for each port. The principal switch selection and the allocation of domain IDs use the WWN to identify a specific port.

To add WWNs from the Fabric Manager, choose **FC > WWN Manager** on the menu tree. The dialog box from the Fabric Manager displays WWN information for multiple switches. To add WWNs from the Device Manager, choose **WWN Manager** from the FC menu. The dialog box from the Device Manager displays WWNs for a single switch.

Both dialog boxes show the display-only information described in [Table 11-1](#).

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**Table 11-1 FC > WWN Manager—Display-Only Attributes**

Display-Only Information	Description
Switch	Displays the switch ID. This attribute is only displayed from the Fabric Manager.
Type 1 WWNs: Max	Displays the maximum number of Type 1 WWNs available for assignment to internal entities. The IEEE publishes standards for three formats for 48-bit WWNs: <ul style="list-style-type: none"> <li>• Type 1</li> <li>• Extended Type 2</li> <li>• Type 5 Registered</li> </ul>
Type 1 WWNs: Available	Displays the number of Type 1 WWNs currently available for assignment to internal entities.
Type 1 WWNs: Reserved	Displays the number of Type 1 WWNs reserved and unavailable for use.
Type 2&5/Other WWNs: Max	Displays the maximum number of total WWNs of types Type 2 and Type 5 available for assignment to internal entities.
Type 2&5/Other WWNs: Available	Displays the sum total of Type 2 and Type 5 WWNs currently available for assignment to the internal entities.
Type 2&5/Other WWNs: Reserved	Displays the number of Type 1 WWNs reserved and unavailable for use.
SwitchWWN	Displays the WWN for the switch (Fabric Manager only)

Table 11-2 describes the configurable attributes for the WWN.

**Table 11-2 FC > WWN Manager—Configurable Attributes**

Configurable Attribute	Description
BaseMacAddress	Specifies the first MAC address used for generating WWNs when the default range of WWNs generated from supervisor MAC addresses is exhausted.
MacAddressRange	Specifies the number of secondary MAC addresses starting from and including the WWN SecondaryBaseMacAddress.

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# Managing Domain Parameters

This section describes how to configure domain parameters and includes the following topics:

- [Viewing Domain Information, page 11-6](#)
- [Configuring Domain Attributes, page 11-4](#)
- [Viewing Domain Information, page 11-6](#)
- [Viewing Domain Manager Statistics, page 11-6](#)
- [Configuring Domain Interfaces, page 11-7](#)
- [Configuring Persistent FCIDs, page 11-8](#)
- [Viewing Domain Areas, page 11-8](#)
- [Viewing Domain Area Ports, page 11-10](#)

## Managing Running Attributes for Domains

To view running domain attributes from the Fabric Manager, choose **FC > Domain Manager > Running** on the menu tree. The dialog box from the Fabric Manager displays domain attributes for multiple switches.

To view running domain attributes from the Device Manager, choose **Domain Manager** from the FC menu and click the **Running** tab. The Domain Manager dialog box, with the Running tab selected, displays domain attributes for a single switch.

Both dialog boxes show the display-only attributes described in [Table 11-3](#).

**Table 11-3 FC > Domain Manage > Principal—Display-Only Attributes**

Display-Only Attribute	Description
Switch	Displays the switch ID. This attribute is only displayed from the Fabric Manager.
Vsan	Displays the VSAN ID.
State	Displays the state of the Domain Manager on the local switch on this VSAN.
Local Switch: DomainId	Displays the Domain Id of the local switch on this VSAN or zero if no Domain Id has been assigned.
Local Switch: WWN	Displays the WWN of the local switch on this VSAN.
Local Switch: Priority	Displays the priority value, used in the principal switch selection process, for the current switch.
Principal Switch: WWN	Displays the WWN of the principal switch on this VSAN, or zero (0) if the identity of the principal switch is unknown.
Principal Switch: Priority	Displays the priority value, used in the principal switch selection process, for the principal switch.

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# Configuring Domain Attributes

From this dialog box you can specify a fabric name for fabric logins on the VSAN and set the priority for the switch used in the principal switch selection process.

[Table 11-4](#) describes the configurable principal attributes for the domain.

**Table 11-4 FC > Domain Manage > Principal—Configurable Attributes**

Configurable Attribute	Description
FabricName	Specifies the WWN that is used for fabric logins on this VSAN.  This attribute is available only if principal switch selection is used.
Priority	Specifies the priority of the switch used in the principal switch selection process.
State	Displays the operating state of the VSAN. Click the <b>State</b> heading to sort the information in ascending or descending order.

To manage domain attributes from the Fabric Manager, choose **FC > Domain Manager > Configuration** on the menu tree. The dialog box from the Fabric Manager lets you manage domain attributes for multiple switches.

To manage domain attributes from the Device Manager, choose **Domain Manager** from the FC menu and click the **Configuration** tab. The Device Manager dialog box displays domain attributes for a single switch.

Both dialog boxes show the display-only attributes described in [Table 11-5](#).

**Table 11-5 FC > Domain Manager > Configuration—Display-Only Attributes**

Display-Only Attribute	Description
Switch	Displays the switch ID. This attribute is only displayed from the Fabric Manager.
Vsan	Displays the VSAN ID.

[Table 11-6](#) describes the configurable attributes for the domain.

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**Table 11-6 FC > Domain Manager > Configuration—Configurable Attributes**

Configurable Attribute	Description
Enable	<p>Enables or disables principal switch selection on this VSAN.</p> <ul style="list-style-type: none"> <li>• If enabled on an active VSAN, the switch participates in principal switch selection.</li> <li>• If disabled, the switch does not participate in the principal switch selection or in domain allocation. In this case, the domain ID must be configured statically.</li> </ul>
ConfigDomain: Id	Specifies the configured domain ID of the local switch on this VSAN, or zero if no domain ID has been configured.
ConfigDomain: IdType	<p>Click to select the type of configured Domain ID. Valid values are:</p> <ul style="list-style-type: none"> <li>• static</li> <li>• preferred</li> </ul>
FabricName	<p>Specifies the WWN that is used for fabric logins on this VSAN.</p> <p>This attribute is available only if principal switch selection is used.</p>
Priority	Specifies the priority of the switch used in the principal switch selection process.
ContiguousAllocation	<p>Specifies how the switch behaves when elected as the principal switch.</p> <p>Check the check box to enable or disable the ContiguousAllocation feature.</p> <ul style="list-style-type: none"> <li>• When enabled, the switch does not accept noncontiguous domain IDs, and attempts to replace all domain IDs in the list with contiguous domain IDs.</li> <li>• When disabled, the switch grants the domain IDs, even if they are noncontiguous.</li> </ul>

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**Table 11-6 FC > Domain Manager > Configuration—Configurable Attributes (continued)**

Configurable Attribute	Description
AutoReconfigure	<p>Specifies how the switch responds if two disjointed fabrics with overlapping domain ID lists merge.</p> <p>Check the check box to enable or disable the AutoReconfigure feature.</p> <ul style="list-style-type: none"> <li>When enabled, the switch rebuilds the fabric.</li> <li>When disabled, the switch isolates the E_ports on which the errors occurred.</li> </ul>
Restart	<p>Specifies whether the domain manager is to reconfigure the fabric and rebuild the domain ID tree again in case of errors. Valid values are:</p> <ul style="list-style-type: none"> <li>nonDisrup</li> <li>disruptive</li> <li>noOp</li> </ul>

## Viewing Domain Information

To view domain information from the Device Manager, choose **Domain Manager** from the FC menu and click the **Domains** tab. The dialog box displays domain information for a single switch and shows the display-only attributes described in [Table 11-7](#).

**Table 11-7 FC > Domain Manager > Domains—Display-Only Attributes**

Display-Only Attribute	Description
Switch	Displays the switch ID. This attribute is only displayed from the Fabric Manager.
Vsan, DomainId	Displays the VSAN ID and the domain ID.
SwitchWwn	Displays the WWN of the switch on this VSAN.

## Viewing Domain Manager Statistics

To monitor domain manager statistics from the Fabric Manager, choose **FC > Domain Manager > Statistics** on the menu tree. The dialog box from the Fabric Manager displays domain statistics for multiple switches.

To monitor domain manager statistics from the Device Manager, choose **Domain Manager** from the FC menu and click the **Statistics** tab. The Domain Manager dialog box, with the Statistics tab selected, displays domain statistics for a single switch.

Both dialog boxes show the display-only attributes described in [Table 11-8](#).

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**Table 11-8 FC > Domain Manager > Statistics—Display-Only Attributes**

Display-Only Attribute	Description
Switch	Displays the switch ID. This attribute is only displayed from the Fabric Manager.
Vsan	Displays the VSAN ID.
PrincipalSwitchSelections	Displays the number of principal switch selections on this VSAN.
Fabrics—Builds	Displays the number of fabric builds on this VSAN.
Fabrics—Reconfigures	Displays the number of fabric reconfigures on this VSAN.
Fcid—Granted	Displays the number of FC IDs granted for use on the local switch since the switch was initialized.
Fcid—Recovered	Displays the number of FC IDs recovered on the local switch since the switch was initialized.
Fcid—Free	Displays the number of FC IDs unassigned for the VSAN.
Fcid—Assigned	Displays the number of FC IDs assigned for the VSAN.
Fcid—Reserved	Displays the number of FC IDs reserved for the VSAN.

## Configuring Domain Interfaces

To configure domain interfaces from the Fabric Manager, choose **FC > Domain Manager > Interfaces** on the menu tree. The dialog box from the Fabric Manager displays domain interfaces for multiple switches.

To configure domain interfaces from the Device Manager, choose **Domain Manager** from the FC menu and click the **Interfaces** tab. The Domain Manager dialog box, with the Interfaces tab selected, displays domain interfaces for a single switch.

Both dialog boxes show the display-only attributes described in [Table 11-9](#).

**Table 11-9 FC > Domain Manager > Interfaces—Display-Only Attributes**

Display-Only Attribute	Description
Switch	Displays the switch ID. This attribute is only displayed from the Fabric Manager.
Vsan, Interface	Displays the VSAN ID and port ID.
Role	Displays the role of this interface.

[Table 11-10](#) describes the configurable attributes for domain interfaces.

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**Table 11-10 FC > Domain Manager > Interfaces—Configurable Attributes**

Configurable Attribute	Description
RcfReject	Enables or disables RcfReject messages on this interface. If enabled, incoming RCF messages are rejected on this interface. If disabled, incoming RCF messages are accepted on this interface.

## Viewing Domain Areas

To monitor domain areas from the Fabric Manager, choose **FC > Domain Manager > Domain > Areas** on the menu tree. The dialog box from the Fabric Manager displays domain areas for multiple switches.

To monitor domain areas from the Device Manager, choose **Domain Manager** from the FC menu and click the **Areas** tab. The Domain Manager dialog box, with the Areas tab selected, displays domain areas for a single switch.

Both dialog boxes show the display-only attributes described in [Table 11-11](#).

**Table 11-11 FC > Domain Manager > Areas—Display-Only Attributes**

Display-Only Attribute	Description
Switch	Displays the switch ID. This attribute is only displayed from the Fabric Manager.
Vsan	Displays the VSAN ID.
AssignedAreaIdList	Displays the list of area IDs assigned in this VSAN.

## Configuring Persistent FCIDs

To configure persistent FCIDs from the Fabric Manager, choose **FC > Domain Manager > Persistent FCIDs** on the menu tree. The dialog box from the Fabric Manager displays persistent FCIDs for multiple switches.

To configure persistent FCIDs from the Device Manager, choose **Domain Manager** from the FC menu and click the **Persistent FCIDs** tab. The Domain Manager dialog box, with the Persistent FCIDs tab selected, displays persistent FCIDs for a single switch.

Both dialog boxes show the display-only attributes described in [Table 11-9](#).

**Table 11-12 FC > Domain Manager > Persistent FCIDs—Display-Only Attributes**

Display-Only Attribute	Description
VsanID, WWN	Displays the VSAN ID and the WWN of the switch on this VSAN.
Used	Displays True if the FC ID is being used; False if the FC ID is not being used.



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Table 11-10 describes the configurable attributes for persistent FCIDs.

**Table 11-13 FC > Domain Manager > Persistent FCIDs—Configurable Attributes**

Configurable Attribute	Description
FcId	Displays the FC ID assigned for this WWN on this VSAN.
Mask	Displays the number of FC IDs which are assigned either statically or dynamically for this WWN on this VSAN. Possible values are Single, meaning just one FCI ID is assigned, or Area, meaning all of the FC IDs in the area that is specified are assigned.
Assignment	Displays the type of persistency of this FC ID (static or dynamic).

Before you can create persistent FCIDs, you must:

- Configure a static domain ID in that VSAN
- Ascertain that the static configured domain and the runtime domain are the same. You can verify this using the `show fcdomain` command. For information about using the command line interface (CLI), refer to the *Cisco 9000 Family Configuration Guide*.



**Note**

If you connect to the switch from an AIX or HP-UX host, be sure to create the persistent FC ID in the VSAN that connects these hosts.



**Note**

Persistent FC IDs with loop-attach devices (FL ports) need to remain connected to the same port in which they were configured.

To create a new persistent FCID, do the following:

**Step 1** Click the Create button.

The Create Domain Manager Persistent FCIDs dialog is displayed.

**Step 2** Enter the VSAN ID.

**Step 3** Enter the WWN.

**Step 4** Enter the FCID.

**Step 5** Select the Mask.

This is the number of FC IDs which are assigned either statically or dynamically for this WWN on this VSAN. Possible values are Single, meaning just one FCI ID is assigned, or Area, meaning all of the FC IDs in the area that is specified are assigned.

**Step 6** Select the Assignment.

This is the type of persistency of this FC ID (static or dynamic).

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- Step 7** Click Create to create the persistent FCID; click Close to return to the Domain Manager without creating the FCID.

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To delete a persistent FCID, do the following.

- Step 1** Select the persistent FCID you want to delete.  
The Delete button is enabled.
- Step 2** Click the Delete button to delete the FCID.
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## Viewing Domain Area Ports

To monitor area ports for domains from the Fabric Manager, choose **FC > Domain Manager > Domain > Area Ports** on the menu tree. The FC dialog box from the Fabric Manager displays area ports for domains for multiple switches.

To monitor area ports for domains from the Device Manager, choose **Domain Manager** from the FC menu and click the **Area Ports** tab. The Domain Manager dialog box, with the Area Ports tab, displays area ports for domains for a single switch.

Both dialog boxes show the display-only attributes described in [Table 11-14](#).

**Table 11-14 FC > Domain Manager > Area Ports—Display-Only Attributes**

Display-Only Attribute	Description
Switch	Displays the switch ID. This attribute is only displayed from the Fabric Manager.
Vsan, AreaId	Displays the VSAN ID and area ID.
Ports	Displays the list of port IDs assigned in this area and VSAN.

## Configuring the Name Server

Configuring the Name Server includes the following tasks.

- [Viewing General Attributes for the Name Server, page 11-10](#)
- [Viewing Advanced Attributes for the Name Server, page 11-11](#)
- [Proxy Ports for the Name Server, page 11-12](#)
- [Viewing Name Server Statistics, page 11-13](#)

## Viewing General Attributes for the Name Server

To view general name server attributes from the Device Manager, choose **Name Server** from the FC menu. The Name Server dialog box, with the General tab selected, displays name server attributes for a single switch. This dialog box shows the display-only attributes described in [Table 11-15](#).

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**Table 11-15 FC > Name Server > General—Display-Only Attributes**

Display-Only Attribute	Description
Vsan, Fcid	Displays the VSAN ID and Fibre Channel ID.
Type	Displays the type of this port. Valid values are: <ul style="list-style-type: none"> <li>Nx_port</li> <li>Fx_port</li> <li>xE_port</li> </ul>
PortName	Displays the Fibre Channel port name (or WWN) for this Nx_port.
NodeName	Displays the Fibre Channel node name (or WWN) for this Nx_port.
FabricPortName	Displays the fabric port name (WWN) of the Fx_port to which this Nx_port is attached.
ClassOfSvc	Displays the class of service supported by the port. Zero (0) indicates that this port does not support any class of service.
FC4Type	Displays the FC-4 protocol types supported by this Nx_port.
FC4Features	Displays the FC-4 features associated with this port and FC-4 type (which shows if the port is the target or initiator).

## Viewing Advanced Attributes for the Name Server

To monitor advanced name server attributes from the Device Manager, choose **Name Server** from the FC menu and click the **Advanced** tab. The Name Server dialog box, with the Advanced tab selected, displays advanced name server attributes for a single switch. This dialog box shows the display-only attributes described in [Table 11-16](#).

**Table 11-16 FC > Name Server > Advanced—Display-Only Attributes**

Display-Only Attribute	Description
Vsan, Fcid	Displays the VSAN ID and Fibre Channel ID.
PortIpAddress	Displays the IP address of the associated port.
SymbolicNodeName	Displays the user-defined node name for this port.
SymbolicPortName	Displays the user-defined name of this port.
NodeIpAddress	Displays the IP address of the node for this Nx_port.
HardAddress	If the port is not an NL_port or if it does not have a hard address, this attribute displays all zeros (0).
ProcAssoc	Displays the Fibre Channel initial process associator (IPA).

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## Proxy Ports for the Name Server

To configure proxy ports for the name server from Fabric Manager, choose **FC > Name Server Proxies** on the menu tree. The dialog box from the Fabric Manager displays name server proxy ports for multiple switches.

To configure proxy ports for the name server from the Device Manager, choose **Name Server** from the FC menu and click the **Proxy** tab. The Name Server dialog box, with the Proxy tab selected, displays name server proxies for a single switch.

Both dialog boxes show the display-only attributes described in [Table 11-17](#).

**Table 11-17 FC > Name Server > Proxies—Display-Only Attributes**

Display-Only Attribute	Description
Switch	Displays the switch ID. This attribute is only displayed from the Fabric Manager.
Vsan	Displays the VSAN ID.

[Table 11-18](#) displays the configurable proxy attributes for the name server.

**Table 11-18 FC > Name Server > Proxies—Configurable Attributes**

Configurable Attribute	Description
PortName	Specifies the name of the proxy port that can register or deregister for other ports on this VSAN. Use the proxy attribute to enable third party registrations.

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## Viewing Name Server Statistics

To monitor name server statistics from the Fabric Manager, choose **FC > Name Server Statistics** on the menu tree. The dialog box from the Fabric Manager displays name server statistics for multiple switches.

To monitor name server statistics from the Device Manager, choose **Name Server** from the FC menu and click the **Statistics** tab. The Name Server dialog box, with the Statistics tab selected, displays name server statistics for a single switch.

Both dialog boxes show the display-only attributes described in [Table 11-19](#).

**Table 11-19 FC > Name Server > Statistics**

Display-Only Attribute	Description
Switch	Displays the switch ID. This attribute is only displayed from the Fabric Manager.
Vsan	Displays the VSAN ID.
Queries—Rx	Displays the total number of queries received by the local switch on this VSAN.
Queries—Tx	Displays the total number of queries sent by the local switch on this VSAN.
Requests Rx—Reg	Displays the total number of registration requests received by the local switch on this VSAN.
Requests Rx—DeReg	Displays the total number of deregistration requests received by the local switch on this VSAN.
Rscns—Rx	Displays the total number of RSCN commands received by the local switch on this VSAN.
Rscns—Tx	Displays the total number of RSCN commands sent by the local switch on this VSAN.
Rejects Tx	Displays the total number of requests rejected by the local switch on this VSAN.

## Viewing LUN Information

This section describes how to manage LUN information and includes the following topics:

- [Configuring LUN Discovery, page 11-13](#)
- [Viewing Logical Unit Information, page 11-14](#)
- [Viewing LUNs Information, page 11-15](#)

## Configuring LUN Discovery

To view logical unit number (LUN) information from the Device Manager, choose **LUN** from the FC menu. The dialog box shows the display-only attributes described in [Table 11-20](#).

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**Table 11-20 LUN Discover**

Display-Only Attribute	Description
StartDiscovery	Determines the scope of LUN discovery. Click <b>local</b> to restrict discovery to directly attached SCSI target devices, ports and LUNs on all VSANs. Click <b>Remote</b> to discover all SCSI target devices, ports and LUNs in the fabric except for those that are directly attached. Click both to discover for both local and remote discovery.
Results—Status	Displays the outcome of the LUN discovery on the local switch. The possible values are: <ul style="list-style-type: none"> <li>inProgress—Indicates that the discovery is still in progress</li> <li>completed—Indicates that the discovery is complete</li> <li>failure—Indicates that the discovery encountered a failure</li> </ul>
CompleteTime	Displays the elapsed time since the last system restart when the last discovery was completed.

## Viewing Logical Unit Information

To view logical unit number (LUN) information from the Device Manager, choose **LUN** from the FC menu and click the **Logical Units** tab. The dialog box shows the display-only attributes described in [Table 11-21](#).

**Table 11-21 LUN Discover—Display-Only Attributes**

Display-Only Attribute	Description
VsanId	The VSAN to which this target belongs.
Port WWN	The name of this authorized and discovered target device or port.
DevType	The device type of the SCSI target.
VendorId	The vendor ID of the SCSI target.
ProductId	The product ID of the SCSI target.
RevLevel	The product revision level of the SCSI target.
OtherInfo	The bytes from 0 to 7 in the INQUIRY command response data.

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## Viewing LUNs Information

To view LUNs information from the Device Manager, choose **LUN** from the FC menu and click the **LUNs** tab. The dialog box shows the display-only attributes described in [Table 11-22](#).

**Table 11-22 LUN Discover—Display-Only Attributes**

Display-Only Attribute	Description
Id	The number of this LUN.
Capacity (M)	The capacity of this LUN.
SerialNum	The serial number of this LUN.

## Viewing RSCN Information

This section describes how to view RSCN information and includes the following topics:

- [Viewing RSCN Nx Registrations, page 11-15](#)
- [Viewing RSCN Statistics, page 11-16](#)

## Viewing RSCN Nx Registrations

To view Nx registrations for RSCN from the Fabric Manager, choose **FC > RSCN Registrations** on the menu tree. The dialog box from the Fabric Manager displays Nx registrations for RSCN for multiple switches.

To monitor Nx registrations for RSCN from the Device Manager, choose **RSCN** from the FC menu. The RSCN dialog box, with the Nx Registrations tab selected, displays Nx registrations for RSCN for a single switch.

Both dialog boxes show the display-only attributes described in [Table 11-23](#).

**Table 11-23 FC > RSCN Registrations—Display-Only Attributes**

Display-Only Attribute	Description
Switch	Displays the switch ID. This attribute is only displayed from the Fabric Manager.
Vsan, FcId	Displays the VSAN ID and Fibre Channel ID.
RegType	Displays the registration desired by the subscriber. Valid values are: <ul style="list-style-type: none"> <li>• fromFabricCtrlr—Indicates RSCNs generated by the fabric controller</li> <li>• fromNxPort—Indicates RSCNs generated by the Nx_port</li> <li>• fromBoth—Indicates RSCNs generated by both the fabric controller and the Nx_port</li> </ul>

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## Viewing RSCN Statistics

To monitor registered state change notification (RSCN) statistics from the Fabric Manager, choose **FC > RSCN Statistics** on the menu tree. The dialog box from the Fabric Manager displays RSCN statistics for multiple switches.

To monitor RSCN from the Device Manager, choose **RSCN** from the FC menu and click the **Statistics** tab. The RSCN dialog box, with the Statistics tab selected, displays RSCN statistics for a single switch.

Both dialog boxes show the display-only attributes described in [Table 11-24](#).

**Table 11-24 FC > RSCN > Statistics—Display-Only Attributes**

Display-Only Attribute	Description
Switch	Displays the switch ID. This attribute is only displayed from the Fabric Manager.
Vsan	Displays the VSAN ID.
RxScrs	Displays the number of State Change Registrations (SCRs) received from Nx_Ports on this VSAN.
ScrRej	Displays the number of SCRs rejected on this VSAN.
RxRscns	Displays the number of RSCNs received from Nx_Ports on this VSAN.
TxRscns	Displays the number of RSCNs transmitted from Nx_Ports on this VSAN.
RscnReqRej	Displays the number of RSCN requests rejected on this VSAN.
RxSwRscns	Displays the number of interswitch RSCNs received from other switches on this VSAN.
TxSwRscns	Displays the number of interswitch RSCNs transmitted to other switches on this VSAN.
SwRscnReqRej	Displays the number of interswitch RSCN requests rejected on this VSAN.

## Configuring Timers

To configure timers from the Fabric Manager, choose **FC > Timers** on the menu tree. The dialog box from the Fabric Manager displays timers for multiple switches.

To configure timers from the Device Manager, choose **Timers/Policies** from the FC menu. The dialog box from the Device Manager displays timers for a single switch.

Both dialog boxes show the display-only attributes described in [Table 11-25](#).



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**Table 11-25 FC > Timers—Display-Only Attributes**

Display-Only Attribute	Description
Switch	Displays the switch ID. This attribute is only displayed from the Fabric Manager.
F_S_TOV	Displays the fabric stability timeout value, which ensures fabric stability during fabric configuration.
Drop Latencies—Switch	Displays the drop latency for the switch in milliseconds.

Table 11-26 describes the configurable timer attributes.

**Table 11-26 FC > Timers—Display-Only Attributes**

Configurable Attribute	Description
R_A_TOV	Specifies the resource allocation timeout value for FxPorts for determining when to reuse an NxPort resource, such as a recovery qualifier. Note that all switches in a fabric should be configured with the same value for this timeout. Valid values are 5000 to 15000 ms.
E_D_TOV	Specifies the error detect timeout value used for FxPorts for detecting an error condition. Note that all switches in a fabric should be configured with the same value for this timeout. Valid values are 2000 to 100000 ms.
D_S_TOV	Specifies the distributed services timeout value, which indicates how long a distributed services requestor waits for a response. Valid values are 5000 to 100000 ms.
Policies—InorderDelivery	If enabled, then the in order delivery is guaranteed. If disabled, it is not guaranteed.
Policies—TrunkProtocol	Enables the trunking protocol. The trunking protocol is used for negotiating trunk mode and calculating operational VSANs on an EISL link. It also performs port VSAN consistency checks. On non-trunking ISL links, if the port VSANs are different, the E ports will be isolated. To avoid this isolation, disable this parameter.

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## Configuring Virtual Routing Redundancy Protocol (VRRP)

Cisco MDS 9000 Family switches support the Virtual Router Redundancy Protocol (VRRP), as described in RFC 2338. VRRP provides redundant paths to a gateway switch. For further information about VRRP, refer to the *Cisco MDS 9000 Family Configuration Guide*.

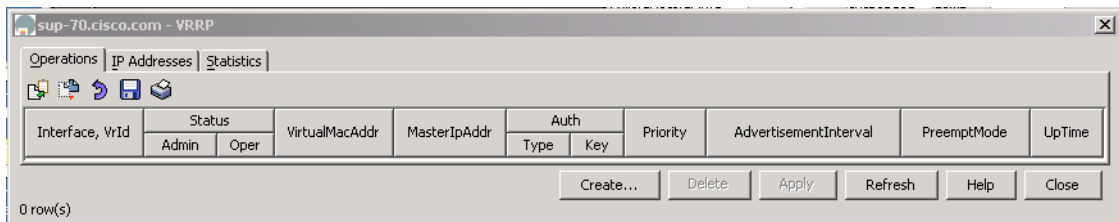
This section describes how to use Device Manager to configure VRRP and includes the following information:

- [Configuring VRRP Operations Attributes, page 11-18](#)
- [Managing IP Addresses for VRRP, page 11-20](#)
- [Viewing VRRP Statistics, page 11-21](#)

### Configuring VRRP Operations Attributes

To configure VRRP operations attributes from Device Manager, choose **VRRP** option from the IP menu. [Figure 11-1](#) shows the VRRP dialog box with the Operations tab selected.

**Figure 11-1 VRRP Dialog Box, Operations View**



The VRRP Operations view shows the display-only attributes described in [Table 11-27](#).

**Table 11-27 VRRP Operations—Display-Only Attributes**

Display-Only Attribute	Description
Interface, VrId	Displays the port ID and virtual router ID.
Stat—Admin	Enables/disables the virtual router, as follows: <ul style="list-style-type: none"> <li>• up—transitions the virtual router from the initialized state to either backup or master.</li> <li>• down—transitions the virtual router from either master or backup to the initialized state.</li> </ul>

***Send documentation comments to*****Table 11-27 VRRP Operations—Display-Only Attributes (continued)**

Display-Only Attribute	Description
Stat—Oper	Displays the current operational state of the virtual router. Valid values are: <ul style="list-style-type: none"> <li>initialize—indicates that the virtual router is waiting for a startup event.</li> <li>backup—indicates that the virtual router is monitoring the availability of the master router.</li> <li>master—indicates that the virtual router is forwarding packets for IP addresses associated with this router.</li> </ul>
VirtualMacAddr	Displays the number of IP addresses associated with this virtual router.
MasterIpAddr	Displays the master router's primary IP address. This is the IP address listed as the source in the last VRRP advertisement received by this virtual router.

[Table 11-28](#) describes the configurable Operations attributes for the virtual router.

**Table 11-28 VRRP Operations—Display-Only Attributes**

Configurable Attribute	Description
Auth—Type	Specifies the authentication type used for VRRP exchanges between virtual routers.
Auth—Key	Specifies the authentication key.
Priority	Specifies the priority to be used for the virtual router master election process. Higher values imply higher priority. A priority of zero (0) is sent by the master router to indicate that this router has ceased to participate in VRRP and a backup virtual router should transition to become a new master. A priority of 255 is used for the router that owns the associated IP addresses.
AdvertisementInterval	Specifies the time interval, in seconds, between sending advertisement messages. Only the master router sends VRRP advertisements.
PreemptMode	Enables a higher priority virtual router to preempt a lower priority master.
UpTime	Displays the time this virtual router transitioned out of the initialized state.

To create a new VRRP entry, click the **Create** button. You see the window shown in [Figure 11-2](#).

## Send documentation comments to

**Figure 11-2 Create VRRP**

Complete the fields on this window to create a new VRRP entry, and click **OK** or **Apply**.

## Managing IP Addresses for VRRP

To manage IP addresses for virtual routers from Device Manager, click the **IP Addresses** tab on the VRRP dialog box.

[Figure 11-3](#) shows the VRRP dialog box with the IP Addresses tab selected.

**Figure 11-3 VRRP Dialog Box, IP Addresses View**

This window shows the display-only attributes described in [Table 11-29](#).

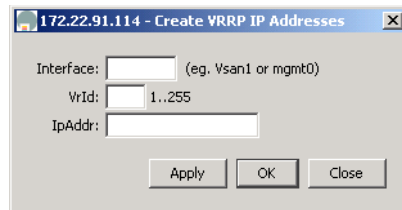
**Table 11-29 VRRP IP Addresses Tab—Display-Only Attributes**

Display-Only Attribute	Description
Port, Vrid, Address	Displays the port ID, virtual router ID, and IP address.
Status	Adds/deletes an associated IP address for the virtual router.

To create a new VRRP entry, click the **Create** button. You see the window shown in [Figure 11-4](#).

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**Figure 11-4 Create VRRP IP Addresses**

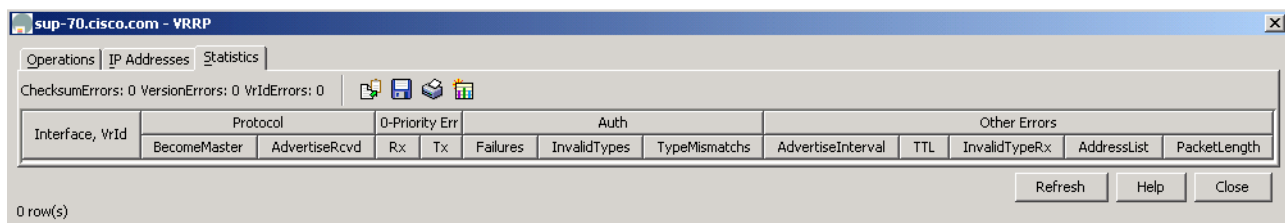


Complete the fields on this window to create a new VRRP IP Address, and click **OK** or **Apply**.

## Viewing VRRP Statistics

To monitor VRRP statistics, click the **Statistics** tab on the VRRP dialog box. [Figure 11-5](#) shows the VRRP dialog box with the Statistics tab selected.

**Figure 11-5 VRRP Statistics**



This window shows the display-only attributes described in [Table 11-30](#).

**Table 11-30 VRRP Statistics Tab—Display-Only Attributes**

Display-Only Attribute	Description
Protocol— BecomeMaster	The total number of times that this virtual router's state has transitioned to MASTER.
Protocol— AdvertiseRcvd	The total number of VRRP advertisements received by this virtual router.
0-Priority-Err— Rx	The total number of VRRP packets received with a priority of 0.
0-Priority-Err— Tx	The total number of VRRP packets sent with a priority of 0.
Auth— Failures	The total number of VRRP packets received that do not pass the authentication check.
Auth— InvalidTypes	The total number of packets received with an unknown authentication type.
Auth— TypeMismatches	The total number of packets that do not match the locally configured authentication method.

***Send documentation comments to*****Table 11-30 VRRP Statistics Tab—Display-Only Attributes (continued)**

Display-Only Attribute	Description
Other Errors— AdvertiseInterval	The total number of VRRP advertisement packets received for which the advertisement interval is different than the one configured for the local virtual router.
Other Errors— TTL	The total number of VRRP packets received by the virtual router with IP TTL (Time-To-Live) not equal to 255.
Other Errors— InvalidTypeRx	The number of VRRP packets received by the virtual router with an invalid value in the 'type' field.
Other Errors— AddressList	The total number of packets received for which the address list does not match the locally configured list for the virtual router.
Other Errors— PacketLength	The total number of packets received with a packet length less than the length of the VRRP header.