Raw Data Formatting: The RDR Formatter and NetFlow Exporting

Revised: February 25, 2015

Introduction

Cisco Service Control is able to deliver gathered reporting data to an external application for collecting, aggregation, storage and processing over two protocols:

- RDRv1: the Service Control proprietary export protocol
- NetFlow V9: an industry standard export protocol

These two protocols can be used simultaneously in the same deployment. However, any specific destination (external collector) to which data is sent can be configured with only one protocol.

The services over IPv6 are classified to the same service IDs as the corresponding services over IPv4. RDRs that contain IP address information provide IPv4 or IPv6 addresses based on the traffic. Transaction Usage RDR, HTTP Transaction Usage RDR, Transaction RDR, Blocking RDR, and Link Usage RDR support IPv6 information.

Note Generic transaction usage RDR or anonymized transaction usage RDR is not generated for IPv6 if the Anonymized transaction usage RDR is enabled on the device.

RDR Formatter and NetFlow Exporting Support

The RDR Formatter

The RDR formatter is used to gather the streams of Raw Data Records (RDRs) events passed from the application, format the data into external reporting protocol (RdrV1 or NetFlowV9), and send these reports to the appropriate destination(s). As the exporting of NetFlow traffic is done by the RDR Formatter, any of the configurations of the RDR Formatter affects the exporting of NetFlowV9 reports. For more information regarding RDR types and a description of their formats, see the *Cisco Service Control Application for Broadband Reference Guide*.

NetFlow

NetFlow reporting protocol is an industry standard for delivering gathered reporting data for external application for collecting, aggregation, storage and processing. The NetFlow protocol option integrates the Service Control solution with a wide range of existing data collectors and reporters.

Release 3.1.0 supports layer 7 application export reporters.

NetFlow Terminology

- Exporter

  A device (in this case, the RDR formatter component in the Cisco SCE platform) with NetFlow services enabled, responsible for exporting information using NetFlowV9 protocol.

- NetFlow Collector

  A device that receives records from one or more exporters. It processes the received export packet(s) by parsing and storing the record information. Records can be optionally aggregated before being stored on the hard disk.

- Export Packet

  A packet originating at the exporter, carrying the records of the exporter to the NetFlow collector.

- Packet Header

  The first part of an export packet. the packet header provides basic information about the packet such as the NetFlow version, number of records contained within the packet, sequence numbering, and the observation domain source ID.

- FlowSet

  A generic term for a collection of flow records that have a similar structure. In an export packet, one or more flowsets follow the packet header. There are two different types of flowsets:

  - Template FlowSet
  - Data FlowSet.

- Template FlowSet

  One or more template records that have been grouped together in an export packet

- Template Record

  Defines the structure and interpretation of fields in a flow data record.

- Data FlowSet

  One or more records, of the same type, that are grouped together in an export packet. Each record is either a flow data record or an options data record previously defined by a template record or an options template record.

- Flow Data Record

  A data record that contains values of the flow parameters corresponding to a template record.

NetFlow Exporting Support

The RDR formatter supports the exporting of NetFlowV9 reports and is able to send export packets to the configured destinations. The packets contain template records and data records. The template records define the format of the following data records. Each export packet may contain both types of records, or only one type of records.

NetFlow Templates

Each RDR type supported for NetFlowV9 exporting has a pre-defined mapping that allows the RDR formatter to convert it to a NetFlow V9 report and sent it over a NetFlow destination. The Cisco SCE platform maintains template records for several RDR types, with the structure of each NetFlow data record that corresponds to that RDR type. All NetFlow templates are pre-defined; users cannot create or edit the NetFlow templates.

Please note that if an RDR tag that is not supported for NetFlow exporting is configured to be sent over a NetFlow destination, this report will not be formatted and sent, and a special counter will be incremented along and a warning will be logged. (See the output of the show rdr-formatter statistics command – 'unsupported-tags'.)

Although template records and data records can be mixed in the same export packet, the template must precede any related data records. For this reason, templates are included in the first export packet, the first time a record is sent, and again at configured intervals (template refresh) to ensure that data records will be recognized and read correctly.

Data Destinations

The Cisco SCE platform can be configured with a maximum of eight destinations, three destinations per category. Each destination is defined by the following parameters:

- IP address
- port number
- protocol (RDRv1 or NetFlow)
- transport type (TCP (RDRv1) or UDP (NetFlow))

The destination is assigned a priority for each category to which it is assigned.

Figure 9-1 illustrates the simplest data destination topology, with only one category and one destination.

Figure 9-1 Data Destination Topology: One Category and One Destination

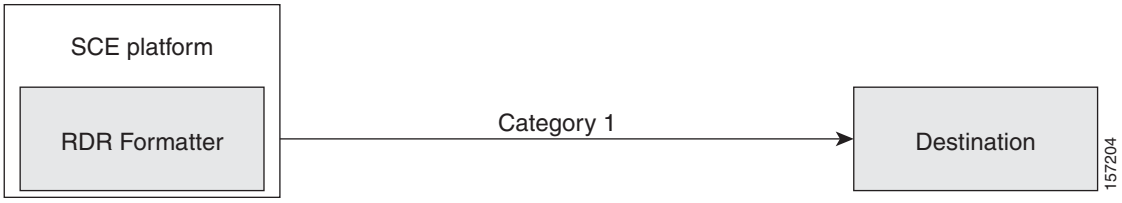
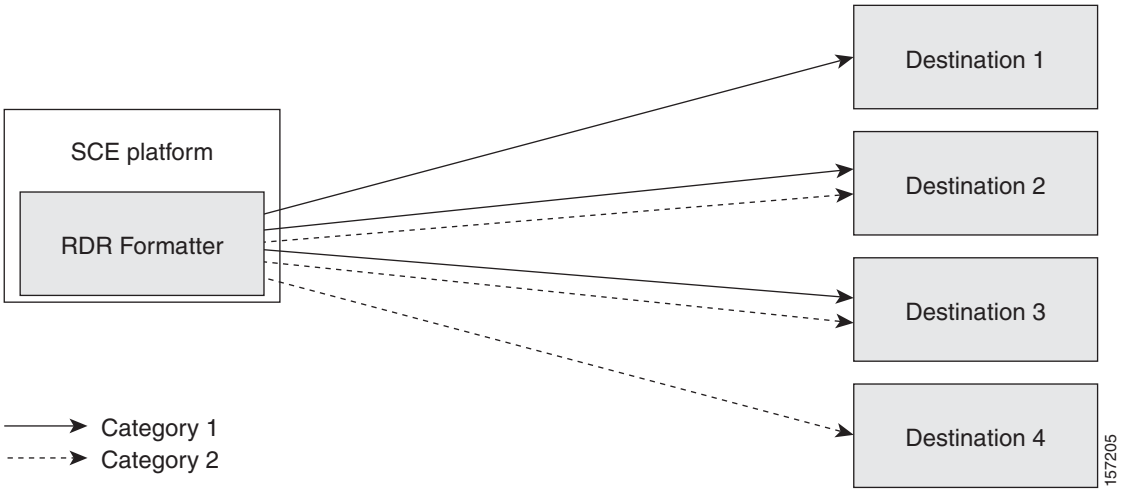


Figure 9-2 illustrates a complex topology using two categories and four destinations. Each category can send data to three of the four destinations.

Figure 9-2 Data Destination Topology: Two Categories and Four Destinations



Categories

In certain installations, data must be sent to different collector servers according to their type. For instance, in the pre-paid environment, some types of data must be sent to the pre-paid collector to get a new quota, while others should be sent to the mediation system. In this case, the data types are divided into up to four groups, and each group, or category, is assigned to a particular destination or destinations. The categories are defined by the application running on the Cisco SCE platform.

The system supports up to four categories:

- **Category 1—**Usage RDRs to the Collection Manager or mediation system
- **Category 2—**Quota RDRs to Pre-Paid Server or Subscriber Controller OSS
- **Category 3—**External events RDR or RT Signaling to various systems, such as a packet cable multi-media policy server
- **Category 4—**URL Query RDR to URL Filtering database (for example, surfControl)

Each destination must be configured regarding each category in use. Each destination may be assigned to more than one category and may be assigned the same or different priorities for each category.

It is also possible to remove a category from a destination, leaving only the desired category. If all categories are removed, the destination itself is deleted.

By default, the categories are referred to as Category 1 through Category 4. However, you can define meaningful names for the categories. This generally reduces confusion and prevents errors.

You can also configure the buffer size for each category. The total buffer size is 80 MB.

Priority

The priority value is used to indicate whether the destination should be a destination for a given category.

Priority is related to the redundant forwarding mode, in that it indicates which is the primary active connection. Priority values have no effect in multicast forwarding mode.

Each destination is assigned a priority value for each category. The first destination that is configured is automatically assigned a priority of 100 (highest priority) for all categories, unless explicitly defined otherwise.

Following are some important points to keep in mind regarding priority values:

- Two destinations may not have the same priority for one category. The priority values for destinations within a category must be unique to have any meaning.
- If only one priority value is assigned to the destination, that priority is automatically assigned to all categories for that destination.
- If only one category is assigned a priority value for a destination, no RDRs from the other categories will be sent to the specified destination.
- Assign a high priority if data from the specified category should be sent to this destination. Assign a low priority if data from the specified category should less likely to be sent to this destination.
- Redundant forwarding mode—Assign a high priority to the primary destination for the system/category. Assign a lower priority to the secondary destination for the system/category.

Setting DSCP for NetFlow

When using the NetFlowV9 protocol, priority can be defined by configuring a DSCP value to be assigned to the NetFlow packets. This DSCP value defines the DiffServ level of the NetFlow traffic to all destinations.

Forwarding Modes

When more than one destination is defined for a category, the system must decide which of these destinations is to receive the data. This is determined by the forwarding mode. There are three forwarding modes:

- Redundancy—All records are sent only to the primary (active) connection. If the primary connection fails, the records will be sent to the connected destination with the next highest priority.
- Multicast—All records are sent to all destinations. This feature may negatively affect performance in an installation with a high rate of data.
- Simple load balancing—Each successive record is sent to a different destination, one destination after the other, in a round robin manner. It is the responsibility of the collectors to aggregate the records.

  If one connection fails, the contents of the history buffer are sent to all connected destinations.

Note Some types of deployments using the NetFlow protocol require multicast forwarding mode. In a deployment where there are multiple destinations for at least one category, and at least one of those is a NetFlow destination, the multicast forwarding mode must be configured.

Protocol

The following two protocols are supported:

- The RDR Formatter: the Service Control proprietary protocol
- NetFlow V9: an industry standard protocol

These two protocols can be used simultaneously in the same deployment. However, each formatter destination can support only one protocol.

Transport Type

The following two transport types are available:

- TCP
- UDP

Currently, the transport type is linked to the configured protocol as follows:

- RDRv1 protocol requires TCP transport type
- NetFlow V9 protocol requires UDP transport type

Configuring Data Destinations and Categories

Configuring a Data Destination

There are three general categories of CLI commands related to the configuration of data destinations:

- General commands that apply to both the RDRv1 protocol and the NetFlow protocol
- Commands that are relevant only to the RDR formatter (may affect NetFlow exporting as well)
- Commands relevant only to the NetFlowV9 protocol and the NetFlow exporting support

Options

In order for the data records, either RDRs or NetFlow export packets, from the Cisco SCE platform to arrive at the correct location, the following parameters must be configured:

- **ip-address—**The IP address of the destination
- **portnumber—**The port number
- **protocol**—The protocol used for data sent to the destination (either RDRv1 or NetFlow; if no protocol is assigned the protocol is RdrV1)
- **transport—**The transport type, TCP or UDP (optional, as this parameter is determined by the protocol)

A priority value may be assigned. Priority is important in the redundancy forwarding mode, but not crucial in multicast mode. Remember that in multicast mode, the existence of any priority value causes the destination to receive reports. The relationship between priorities and categories is addressed in "Configuring a Destination and Assigning Categories" section on page 9-9.

From the SCE(config)# prompt, type:

Command	Purpose
rdr-formatter destination *ip-address* **port** *portnumber* **[priority** *priority***] protocol** *protocol* **[transport** *transport***]**	Defines the destination. When no category is specified, the specified priority is assigned to all categories.

Configuring the Data Destinations: Examples

Example 1

This example shows how to configure a simple system with only one destination, using the NetFlow protocol. With only one destination, it is not necessary to configure a priority value.

```
SCE(config)# rdr-formatter destination 10.1.1.205 port 33000 protocol NetFlowV9 transport
udp
```

Example 2

The following example shows how to configure two destinations in a system without using the categories.

The first destination will automatically be assigned a priority of 100, and therefore the priority does not need to be explicitly defined. For the second destination, the priority must be explicitly defined.

The same priority will automatically be assigned to both categories for each destination, but since the categories will be ignored, this is irrelevant.

```
SCE(config)# rdr-formatter destination 10.1.1.205 port 33000 protocol RdrV1 transport tcp
SCE(config)# rdr-formatter destination 10.1.1.206 port 33000 priority 80 protocol RdrV1
transport tcp
```

Configuring the Data Categories

There are three steps in defining the data categories:

- Define the category names (optional).
- Configure the buffer size (optional).
- Configure the destinations with the proper priorities for each category, as well as configuring all the other destination parameters, may be approached in several different ways, and may take some planning. Refer to the examples below for illustrations of some of the issues involved in configuring categories.

Options

The following options are available:

- **category-number—**The number of the category (1-4)
- **category-name—**The name to be assigned to the category

From the SCE(config)# prompt, type:

Command	Purpose
rdr-formatter category number *category-number* **name** *category-name*	Defines the name for the specified category number. This category name can then be used in any **rdr-formatter** command instead of the category number.

Configuring the Buffer Size

Options

The following options are available:

- **category-number**—the number of the category (1-4)
- **size**—the size of the buffer in bytes

  By default, the buffer sizes are as follows:

  - Category 1—40 MB
  - Category 2—24 MB
  - Category 3—8 MB
  - Category 4—8 MB

  Total buffer size is 80 MB.

From the SCE(config)# prompt, type:

Command	Purpose
rdr-formatter category number *category-number* **buffer-size** *size*	Configures the buffer size for the specified category number.

Configuring a Destination and Assigning Categories

Options

The following options are available:

- **ip-address—**The IP address of the destination
- **portnumber—**The port number
- **category-number—**The number of the category (1-4)
- **category-name—**The name to be assigned to the category
- **priority—**The priority value assigned to this category for this destination (1-100)
- **protocol—**The protocol used for data sent to the destination (either RDRv1 or NetFlow; if no protocol is assigned the protocol is RdrV1)
- **transport—**The transport type, TCP or UDP (optional, as this parameter is determined by the protocol)

General Guidelines:

- A maximum of four categories can be configured in one command.
- The category may defined by either number or name.
- A different priority may be assigned to each category.
- Note that within each category the priorities must be unique for each destination.

From the SCE(config)# prompt, type:

Command	Purpose
rdr-formatter destination *ip-address* **port** *portnumber* **category [name** *category-name* **| number** *category-number*] **[priority** *priority*] **[category [name** *category-name* **| number** *category-number*] **[priority** *priority*]] **[category [name** *category-name* **| number** *category-number*] **[priority** *priority*]] **[category [name** *category-name* **| number** *category-number*] **[priority** *priority*]] **protocol** *protocol* **[transport** *transport*]	Defines the destination and assigns categories with optional priorities.

Configuring the Data Destinations with Categories: Examples

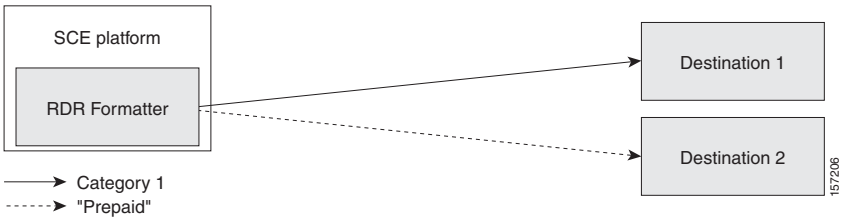
Example 1

The following example defines a name for one category, and then configures two destinations, assigning each to a different category (Figure 9-3).

The data from category 1 goes to the first destination, so a high priority was assigned to that category in the first destination, and no priority in the second.

Since all data from category 2 (prepaid) goes to the second destination, the priority assigned to category 2 is assigned only to the second destination and not to the first.

Figure 9-3 Configuring Destinations: Two Categories and Two Destinations



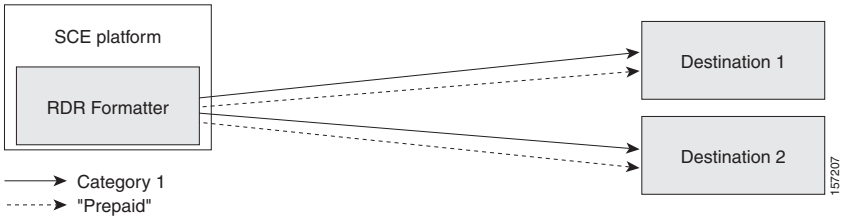
Note that if there is a loss of connection to either destination, transmission of data of the relevant category is interrupted until the connection is re-established. There is no redundant connection defined for either category.

```
SCE(config)# rdr-formatter category number 2 name prepaid
SCE(config)# rdr-formatter destination 10.1.1.205 port 33000 category number 1 priority 90
protocol RdrV1 transport tcp
SCE(config)# rdr-formatter destination 10.1.1.206 port 33000 category name prepaid
protocol RdrV1 transport tcp
```

Example 2

This example is similar to the above, but a low priority is assigned to the second category for each destination, rather than no priority (Figure 9-4). This allows each destination to function as a backup for the other in case of a problem with one of the connections (redundancy forwarding mode).

Figure 9-4 Configuring Destinations: Two Categories with Redundancy Mode




```
SCE(config)# rdr-formatter category number 2 name prepaid
SCE(config)# rdr-formatter destination 10.1.1.205 port 33000 category name prepaid
priority 90 category number 1 priority 25 protocol RdrV1 transport tcp
SCE(config)# rdr-formatter destination 10.1.1.206 port 33000 category number 1 priority 80
category name prepaid priority 20 protocol RdrV1 transport tcp
```

Example 3

This example demonstrates two methods for assigning one category to the first destination only, while the other category uses the second destination as the primary destination, and the first destination as a secondary destination.

```
SCE(config)# rdr-formatter category number 2 name prepaid
SCE(config)# rdr-formatter destination 10.1.1.205 port 33000 category name prepaid
priority 90 category number 1 priority 10 protocol RdrV1 transport tcp
SCE(config)# rdr-formatter destination 10.1.1.206 port 33000 category number 1 priority 95
protocol RdrV1 transport tcp
```

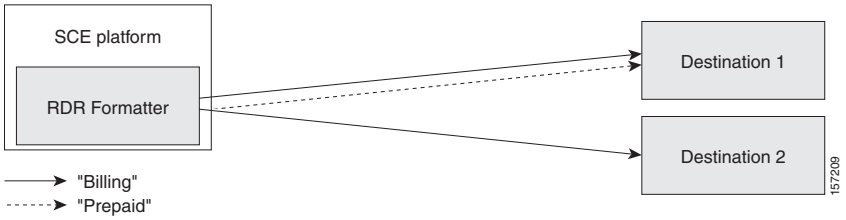
In the following example, all priority values seem quite high. However, it is the relative values of priorities for a category that determine which destination is the primary destination.

```
SCE(config)# rdr-formatter category number 2 name prepaid
SCE(config)# rdr-formatter destination 10.1.1.205 port 33000 priority 90 protocol RdrV1
transport tcp
SCE(config)# rdr-formatter destination 10.1.1.206 port 33000 priority 95 protocol RdrV1
transport tcp
SCE(config)# no rdr-formatter destination 10.1.1.206 port 33000 category name prepaid
protocol RdrV1 transport tcp
```

Example 4

This example illustrates a more complex configuration with one category (prepaid) assigned to one destination and the other (billing) being sent to both destinations, in multi-cast mode (Figure 9-5).

Figure 9-5 Configuring Destinations: Two Categories and Two Modes



The forwarding mode is defined for the entire RDR formatter, not just one category. Since the category "prepaid" goes to only one destination, the forwarding mode is irrelevant. It is relevant, however to the "billing" category, since it goes to two different destinations.

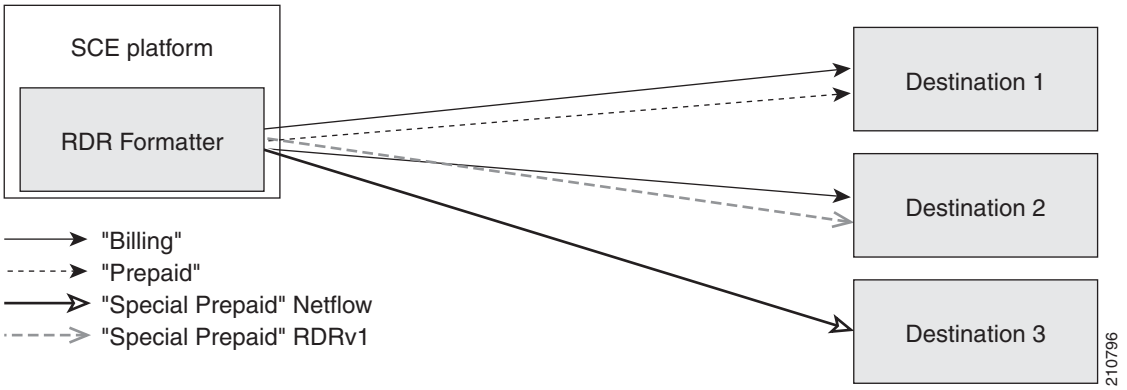
```
SCE(config)# rdr-formatter forwarding-mode multicast
SCE(config)# rdr-formatter category number 1 name billing
SCE(config)# rdr-formatter category number 2 name prepaid
SCE(config)# rdr-formatter destination 10.1.1.205 port 33000 priority 40 protocol
NetFlowV9 transport udp
SCE(config)# no rdr-formatter destination 10.1.1.205 port 33000 category name prepaid
protocol NetFlowV9 transport udp
SCE(config)# rdr-formatter destination 10.10.10.96 port 33000 category name billing
priority 90 protocol NetFlowV9 transport udp
SCE(config)# rdr-formatter destination 10.1.96.0 port 33000 category name prepaid priority
80prepaid priority 80 protocol NetFlowV9 transport udp
```

Example 5

Finally, the following example illustrates a configuration with three categories and three destinations, as follows (Figure 9-6):

- Category 1: 'Billing", RDRv1 protocol, goes to Destination 1
- Category 2: "Prepaid", RDRv1 protocol, goes to Destinations 1 and 2
- Category 3: "Special Prepaid", NetFlow V9 protocol, goes to Destination 3, RDRv1 protocol goes to Destination 2

Figure 9-6 Configuring Destinations: Three Categories and Two Protocols




```
SCE(config)# rdr-formatter forwarding-mode multicast
SCE(config)# rdr-formatter category number 1 name billing
SCE(config)# rdr-formatter category number 2 name prepaid
SCE(config)# rdr-formatter category number 3 name special-prepaid
SCE(config)# rdr-formatter destination 10.1.1.205 port 33000 category name billing
priority 90 category name prepaid priority 80 protocol RdrV1 transport tcp
SCE(config)# rdr-formatter destination 10.10.10.96 port 33000 category name prepaid
priority 90 category name special-prepaid priority 80 protocol RdrV1 transport tcp
SCE(config)# rdr-formatter destination 10.1.1.206 port 33000 category name special-prepaid
priority 90 protocol NetFlowV9 transport udp
```

Configuring the Forwarding Mode

In a deployment where there are multiple destinations for at least one category, and at least one of those is a NetFlow destination, the multicast forwarding mode must be configured.

Options

The following forwarding modes are available:

- **redundancy—**All records are sent only to the primary (active) connection. If the primary connection fails, the records will be sent to the connected destination with the next highest priority.
- **multicast—**All records are sent to all destinations. This feature may negatively affect performance in an installation with a high rate of data.
- **load-balancing—**Each successive record is sent to a different destination, one destination after the other, in a round robin manner. It is the responsibility of the collectors to aggregate the records.

From the SCE(config)# prompt, type:

Command	Purpose
rdr-formatter forwarding-mode *mode*	Configures the specified forwarding mode.

Configuring the Forwarding Mode: Example

The following example shows how to set the forwarding-mode to multicast.

```
SCE(config)# rdr-formatter forwarding-mode multicast
```

Configuring the RDR Formatter

Options

The following options are relevant specifically to the RDR formatter:

- Enabling and disabling the RDR formatter
- Setting the size of the RDR formatter history buffer.
- Dynamic mapping of RDRs to categories (see "Configuring the Flexible Redirection Across SCOS Login" section on page 9-16)

Use the following commands to enable or disable the RDR Formatter:

From the SCE(config)# prompt, type:

Command	Purpose
service rdr-formatter	Enables the RDR formatter.
no service rdr-formatter	Disables the RDR formatter.

How to Configure the Size of the RDR Formatter History Buffer

The following option is available:

- **size**—size of the history buffer in bytes. Maximum buffer size is 64 KB.

From the SCE(config)# prompt, type:

Command	Purpose
rdr-formatter history-size *size*	Sets the size of the RDR formatter history buffer.

Configuring NetFlow Exporting Support

Options

The following options are relevant specifically to NetFlow exporting support (within the RDR-Formatter):

- Assigning a DSCP value to the NetFlow export packets to a specified destination for priority configuration.

  The DSCP value must be between 0 and 63, and be entered in HEX format.
- Configuring the frequency of exporting the template records (template refresh interval)

How to Configure a DSCP Value for NetFlow

Options

The following option is available:

- **dscp-value—**DSCP value to be assigned to the NetFlow packets over all destinations (0-63 in HEX format)

From the SCE(config)# prompt, type:

Command	Purpose
rdr-formatter protocol NetFlowV9 dscp *dscp-value*	Configures the DSCP value for NetFlow exporting support.

How to Configure the Template Refresh Interval

Options

The following options are available:

- **ip-address—**The destination IP address.
- **port-number—**The destination port number
- **timeout-value—**The frequency of exporting the template records in seconds (1 – 86400.)

From the SCE(config)# prompt, type:

Command	Purpose
rdr-formatter destination *ip-address* **port** *port-number* **protocol NetFlowV9 template data timeout** *timeout-value*	Sets the template refresh interval.

Configuring the Flexible Redirection Across SCOS Login

The REDIRECTION_HISTORY_RDR is generated whenever a redirection happens for the subscriber on breaching the quota.

The following pre-configuration are required to enable the “Flexible redirection across login” feature:

- Apply PQB.

  For more information, see “Subscriber Redirection” section in Cisco Subscriber Manger user guide.

  For more information, see “Redirection History RDR” section in Cisco Service Control Application for Broadband reference guide.

- Change the redirection history RDR from Category -1 to Category - 3 (as Subscriber Manager receives Category-3 RDR only).

```
SCE8000#>conf
SCE8000(config)#>rdr-formatter rdr-mapping tag-ID 0xf0f0f061 category-number 3
SCE8000(config)#>no rdr-formatter rdr-mapping tag-ID 0xf0f0f061 category-number 1
```

- Configure the RDR-formatter.

```
SCE8000#>configure
SCE8000(config)#>RDR-formatter forwarding-mode multicast
SCE8000(config)#>RDR-formatter destination [SM-IP Address] port 33145 category number
3 priority 100
```

Note The default port number for redirection is 33145. If you want to change the port number other than the default port number, you need to change the port number both on the Subscriber Manager side and RDR-formatter side.

Note One subscriber can have up to 128 profiles redirected.

In redirection section, the following two parameters will be added in p3sm.cfg file of Subscriber Manager:

- enable—This parameter is used to enable the Profile Redirection Feature. The values are yes/no.
- redirection_rdr_port—This parameter validates the port number. The default value is 33145.

Sample Configuration

```
#The following parameters define Profile Redirection feature options
[Redirection]
#To enable Profile Redirection Feature this should be used. By default no.
enable=no
#The port on which redirect rdr server to be run. By default 33145
redirection_rdr_port=33145
```

For more information, see *Cisco Service Control Subscriber Manager User Guide, Release 5.1.x.* and *Cisco Service Control Application for Broadband User Guide, Release 5.1.x*

Configuring Redirection Rate Limit

- In 5.1.0, Redirection Rate Limit feature configuration is done per redirection profile. This feature controls the redirections based on per second per profile.
- In this design, timer task will check every second to allow redirection or not as per configuration. If redirections exceed the configured Redirection Rate Limit value in a specific time, further redirections are not allowed. In other words, redirections will continue provided that the rate limit value not exceeding the configured redirection rate limit value.
- This feature will work with all subscriber redirection options – Only Once , Always, Periodically and Once in a Day/Week/Month.
- The Rate Limit value is configured for all 12 TP's. Based on this, each TP will get redirections as per the configured value (configured rate limit value divided by 12).

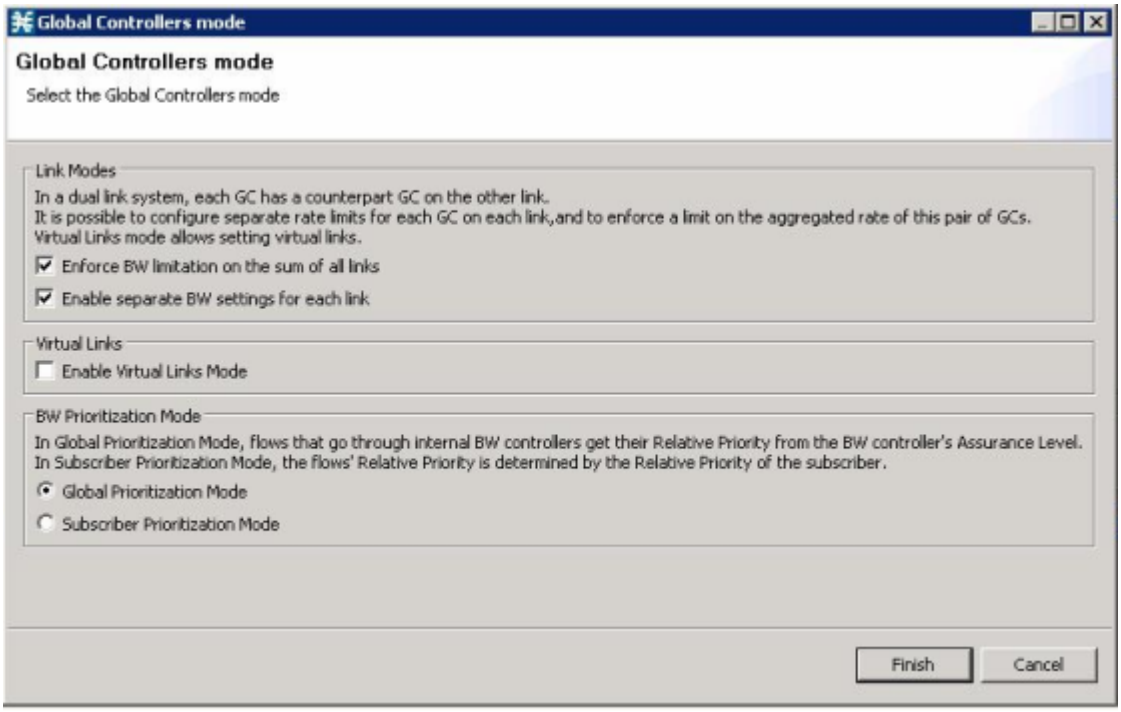
Configuring Total Link Limit

This feature enables SCE to control the total traffic rate in each link per system level. By using this feature, each SCE link can be rate limited with configured equal rate or different rate in AGC / GC mode to cater to the Customer requirements.

To configure to AGC/GC mode in SCE:

Step 1 Select the checkboxes **Enforce BW limitation on the sum of all links** and **Enable separate BW settings for each link** in SCABB console.

Figure 9-7 Configuring AGC/GC mode in SCE

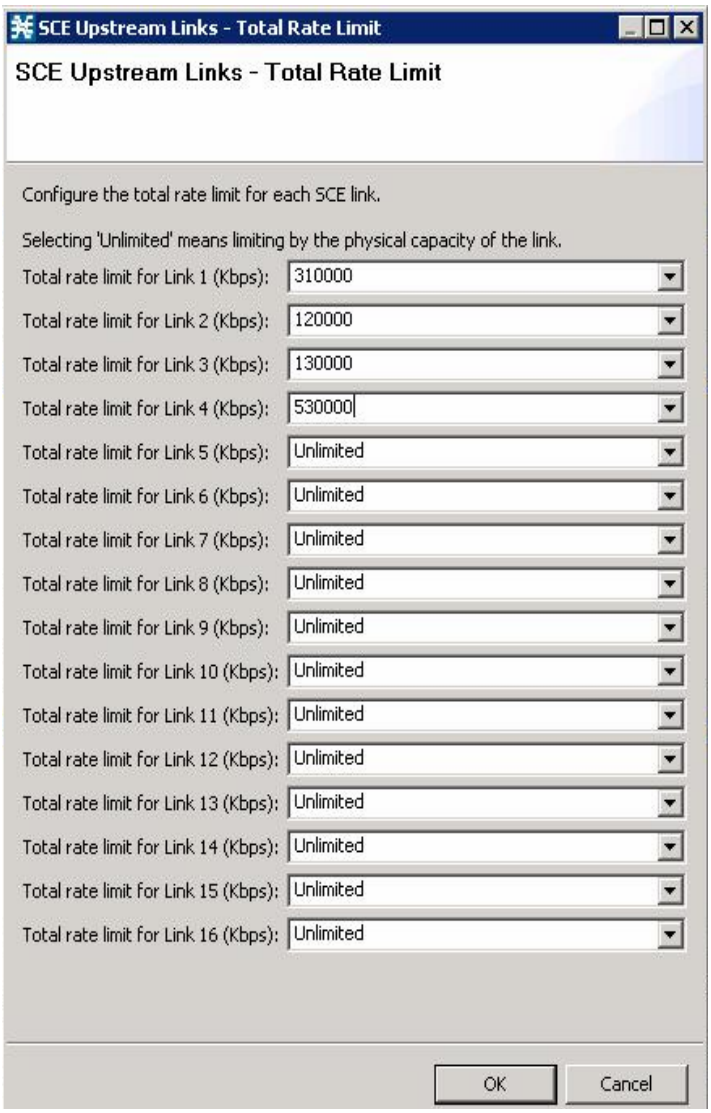


Step 2 Configure Edit Link Rate for both upstream and downstream.

To configure same rate for each link or different rate for each link:

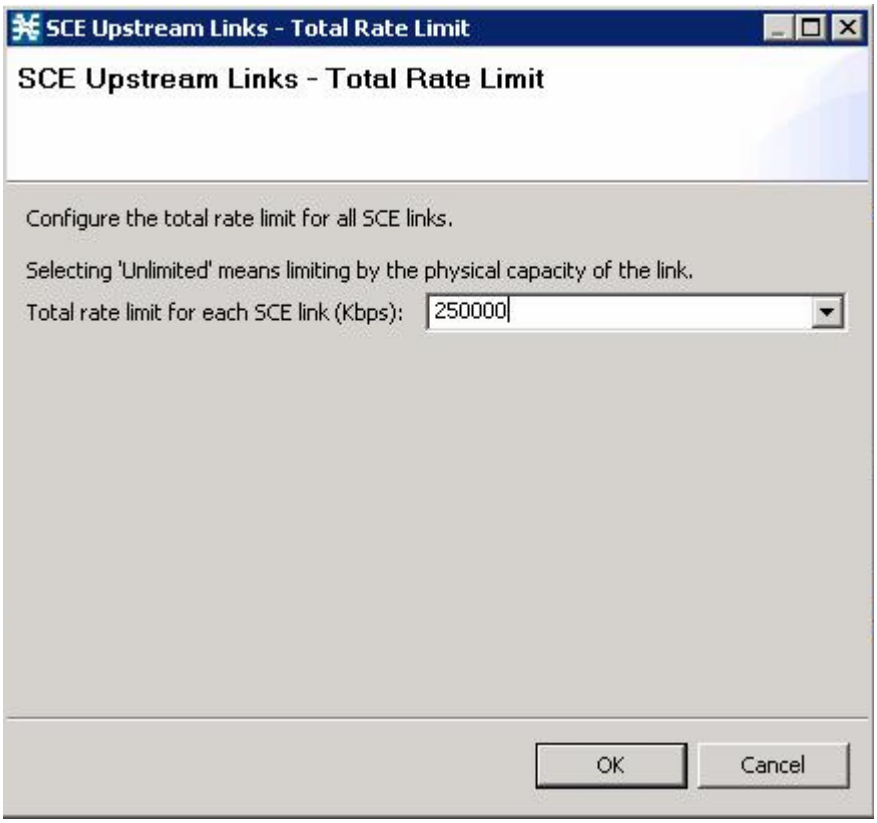
a. Disable the checkbox "Enable separate BW settings for each link" to configure same rate for each link.

Figure 9-8 Configuring same rate for each link



b. Enable the checkbox "Enable separate BW settings for each link" to configure different rate for each link.

Figure 9-9 Configuring different rate for each link



Step 3 Apply PQB to SCE.

Note Make sure to check the insight reports to confirm the total traffic rate is achieved per link.

Configuring Dynamic Mapping of RDRs to Categories

Dynamic configuration of RDRs to multiple categories is supported.

Each RDR tag has a list of categories. The default category is the one that was assigned when application was loaded.

The configuration of categories to RDR tags is done by adding and removing mappings. A user can add a mapping of an RDR tag to a category and can remove a mapping, including the default mapping. If all categories are removed from a tag, the tag is ignored as long as it remains with no mapped categories.

The user must provide the RDR tag ID and the category number to add or remove. The configuration is saved as part of the application configuration.

Configuring Mappings

Use these command to add or remove a mapping.

- Options, page 9-21

- How to Restore the Default Mapping for a Specified RDR Tag, page 9-21

Options

The following options are available:

- **tag-umber—**The complete 32 bit value given as an hexadecimal number. The RDR tag must be already configured in the Formatter by the application.
- **category-number—**Number of the category (1-4) to which to map the RDR tag.

From the SCE(config)# prompt, type:

Command	Purpose
rdr-formatter rdr-mapping (tag-id *tag-number* **category-number** *category-number***)**	Adds a mapping to a category. If the table already contains a mapping with the same tag and category number, an error is issued and nothing is done.
no rdr-formatter rdr-mapping (tag-id *tag-number* **category-number** *category-number***)**	Removes a mapping from a category.

How to Restore the Default Mapping for a Specified RDR Tag

From the SCE(config)# prompt, type:

Command	Purpose
default rdr-formatter rdr-mapping tag-id *tag-number*	Restores the default mapping for a specified RDR tag.

Displaying Data Destination Configuration and Statistics

The following commands can be used to display the RDR formatter configuration and statistics:

- **show rdr-formatter**
- **show rdr-formatter connection-status**
- **show rdr-formatter counters**
- **show rdr-formatter destination**
- **show rdr-formatter enabled**
- **show rdr-formatter forwarding-mode**
- **show rdr-formatter rdr-mapping**
- **show rdr-formatter statistics**
- **show rdr-formatter protocol NetFlowV9 dscp**

For a complete description of the other s**how rdr-formatter** commands, see the *Cisco SCE8000 CLI Command Reference* .

How to the Display the Current RDR Formatter Configuration

The system can display the complete data destination configuration, or just specific parameters.

From the SCE> prompt, type:

Command	Purpose
show rdr-formatter	Displays the current RDR formatter configuration.

Displaying the RDR Formatter Configuration: Example

The following example shows how to display the current RDR formatter configuration.

```
SCE#show rdr-formatter
Status: enabled
Connection is: up
Forwarding mode: redundancy
Connection table:
-------------------------------------------------------------------------|
Collector    | Port|Status|           Priority per Category:               |
IP Addres /  |     |      |-----------------------------------------------|
Host-Name    |     |      |Category1  |Category2  |Category3  |Category4  |
-------------------------------------------------------------------------|
10.1.1.205   |33000|Up    |100 primary|100 primary|100 primary|100 primary|
10.1.1.206   |33000|Down  |60         |60         |60         |60         |
10.12.12.12  |33000|Up    |40         |40         |40         |40         |
-------------------------------------------------------------------------|
RDR:    queued:    0 , sent:4460807,  thrown:   0,  format-mismatch:0
UM:     queued:    0 , sent:      0,  thrown:   0
Logger: queued:    0 , sent:     39,  thrown:   0
Errors: thrown:    0
Last time these counters were cleared: 20:23:05  IST  WED March 14 2007
```

How to the Display the Current RDR Formatter Statistics

From the SCE> prompt, type:

Command	Purpose
show rdr-formatter statistics	Displays the current RDR formatter statistics.

Displaying the Current RDR Formatter Statistics: Example

The following example shows how to display the current statistics in a deployment using both RDRv1 and NetFlow protocols.

```
SCE#show rdr-formatter statistics
RDR-formatter statistics:
=========================
Category 1:
sent:               1794517
in-queue:           0
thrown:             0
format-mismatch:    0
unsupported-tags:   1701243
rate:               2 RDRs per second
max-rate:           64 RDRs per second
Category 2:
sent:               12040436
in-queue:           0
thrown:             0
format-mismatch:    0
unsupported-tags:   0
rate:               12 RDRs per second
max-rate:           453 RDRs per second
Category 3:
sent:               0
in-queue:           0
```

```
thrown:             0
format-mismatch:    0
unsupported-tags:   0
rate:               0 RDRs per second
max-rate:           0 RDRs per second
Category 4:
sent:               0
in-queue:           0
thrown:             0
format-mismatch:    0
unsupported-tags:   0
rate:               0 RDRs per second
max-rate:           0 RDRs per second
Destination:    10.56.201.50 Port: 33000 Status: up
Sent:   13835366
Rate:   211  Max:   679
Last connection establishment:  17 hours, 5 minutes, 14 seconds
Destination:     10.56.204.7 Port: 33000 Status: up
Sent:   12134054
Rate:   183  Max:   595
Sent Templates:         13732
Sent Data Records:   12134054
Refresh Timeout (Sec):      5
Last connection establishment:  17 hours, 5 minutes, 15 seconds
```

Disabling the Linecard from Sending RDRs

The **silent** command disables the linecard from issuing data records. Both RDRs and NetFlow export packets are suppressed.

Use the **no** form of this command if you want the linecard to send records.

From the SCE(config if)# prompt, type:

Command	Purpose
silent	Disables the linecard from issuing data records.
no silent	Enables the linecard to produce data records.

Disabling RDR Aggregation

In large deployments, if each traffic processor sends its own records separately to the CM, the number of RDRs reaching the CM becomes enormous. Therefore, the Cisco SCE platform aggregates certain RDRs, thus reducing the load on the CM without affecting the usability of the information provided. In essence, the control processor receives records from all traffic processors, but it only sends one record for each reporting period, containing the aggregated data of all CPUs together.

The RDR aggregation feature is relevant only to global records. More specifically, only periodic records are aggregated, because other records relate to events like a single transaction or flow, and cannot be aggregated across processors – if they are aggregated, they loose the required granularity.

Currently the following RDRs are aggregated:

- Virtual Link Usage RDRs (VLURs)
- Link Usage RDRs (LURs)
- Package Usage RDRs (PURs)

You can disable RDR aggregation for either a specific RDR type, or for all aggregated RDRs.

From the SCE(config if)# prompt, type:

Command	Purpose
no periodic-records aggregate-by-cpu [all | LUR | PUR | VLUR]	Disables RDR aggregation for either a specific RDR type, or for all aggregated RDRs.
periodic-records aggregate-by-cpu [all | LUR | PUR | VLUR]	Re-enables RDR aggregation.

To display the current RDR aggregation configuration, use the following command:

Command	Purpose
show interface LineCard 0 periodic-records aggregation	Displays the current RDR aggregation configuration.