CHAPTER 5

# Managing the Remote Cable MSO Links Solution

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## Introduction

This chapter describes the three monitoring mechanisms that you can use to monitor the traffic optimization on remote links solution:

- p3vlink command line utility (CLU)
- SCE command line interface (CLI)
- Reporter tool virtual links report template group

## Virtual Links Names

Each virtual link represents a single interface on the CMTS device and the virtual link name comprises the CMTS device name and the interface name. The virtual links are named according to the following naming convention:

<Device name>_<Interface name>

- <Device name>—This portion of the name is set when configuring the CMTS in the vlink.cfg configuration file.
- <Interface name>—This portion of the name identifies the specific CMTS interface including the direction and the interface index. This information is how the CMTS describes the interface internally and is retrieved from the CMTS device using SNMP.
  - The direction portion of the virtual link name indicates the virtual link direction. This can be *upstream* or *downstream*.
  - The interface index indicates the specific interface on the CMTS of the virtual link.

The following is an example virtual link name for a CMTS device named Device-1:

```
Device-1_CMTS1/0-upstream 1
```

If a downstream virtual link contains two channels, then the virtual link names are displayed as:

<Device name>_<Interface name>-L<index of the primary channel>

or

<Device name>_<Interface name>-W

# Monitoring Using the p3vlink Utility

The **p3vlink** utility provides the ability to show virtual link configurations and metrics related to the virtual links. The command format is:

```
p3vlink OPERATION [OPTIONS]
```

Table 5-1 and Table 5-2 lists the **p3vlink** operations and options.

*Table 5-1 p3vlink Operations*

| Operation | Description | Notes |
|---|---|---|
| **--show** | Displays the current general configuration, CMTS device list, and CMTS device information. | — |
| **--show-device** | Displays general configuration of the specified CMTS device that is known to the VLM.<br>To specify the CMTS device, use the **-d** option.<br>To show all the links related to the CMTS device, specify the **--detail** option. | — |
| **--resync** | This command gets all the SCE virtual link configurations and sends it to the SCE, SCE-Sniffer DHCP LEG, and CM.<br>To specify the SCE, use the option **-n SCE_NAME**.<br>To specify a collection manager, use the option **-n CM_NAME**. In this case, the VLM gets all the SCE virtual links that are related to the specified collection manager and sends the data to the collection manager. | This is a nonblocking command. Query operation and synchronization operation is activated in the background. |
| **--resync-all** | For each SCE, this command gets all the SCE virtual link configurations and sends them to the SCE, SCE-Sniffer DHCP LEG, and collection manager. | This is a nonblocking command. Query operation and synchronization operation is activated in the background. |
| **--start-query** | Start the on demand query operation (and the CMTS device synchronization operation) for one CMTS device or more separated by ",".<br>To specify the CMTS device to be queried, use the option **-d <device name>**. | This is a nonblocking command. Query operation and synchronization operation is activated in the background. |
| **--show-vlinks** | Shows the virtual links and virtual link indexes related to the specified SCE.<br>Use the option **-n <SCE name>** to specify the SCE.<br>(Optional) To specify the prefix of the virtual links that you want this command to show, use the option **--prefix=<vlink prefix>**. | — |
| **--show-vlink-data** | Shows all the data related to the specified link.<br>To specify the vlink, use the one of the following options:<br>**--vlink-name=<name>** or<br>**--vlink-id=<id>**, **--ne-name**, and **--direction** | — |

*Table 5-1 p3vlink Operations (continued)*

| Operation | Description | Notes |
|---|---|---|
| **--show-subs** | This command has two uses:<br>Show all subscribers connected to a specific CMTS device.<br>To specify the CMTS device, use the **-d <device name>** option.<br>(Optional) To specify the virtual link ID, use the **--vlink-id=<id>** option.<br>(Optional) To specify the virtual link direction, use the **--direction=<up\|down>** option.<br>(Optional) To specify the prefix of the virtual links that you want this command to show, use the option **--prefix=<vlink prefix>**.<br>Show all subscribers connected to a specific CMTS device interface, or related to a specific CMTS device.<br>To show all subscribers related to the vlink, use **--vlink-name=<name>**. Because each vlink represents one CMTS device interface, this command enables you to see all subscribers traveling from a specific CMTS device interface. | This command retrieves subscribers whose giaddr attribute is one of the CMTS devices giaddr attributes.<br>The result can be filtered by using:<br>• Prefix (first use only)<br>• Vlink-id (first use only)<br>• direction |
| **--remove-device** | Removes a dynamic device from the VLM.<br>To specify the CMTS device, use the **-d <device name>** option. | Once the device is removed, VLM deletes all virtual links related to the device from the SCE. The subscribers of the affected device are logged in with default vlink mappings. |
| **--enable-logging –d <device name>** | Enables login on a specific device.<br>To specify the CMTS device, use the **-d <device name>** option. | This command sets the log_all flag related to the device to true.<br>During load-config and SM restart operations, the value of log_all is reset to the value defined in the configuration file. |
| **--disable-logging –d <device name>** | Disables login on a specific device.<br>To specify the CMTS device, use the **-d <device name>** option. | This command sets the log_all flag related to the device to false.<br>During load-config and SM restart operations, the value of log_all is reset to the value defined in the configuration file. |

*Table 5-2 p3vlink Options*

| SM Option | Abbreviation | Description |
|---|---|---|
| **--ne-name=***NAME* | **-n** *NAME* | Specifies the logical name of the SCE platform or CM. |
| **--device=***DEVICE* | **-d** *DEVICE* | Specifies the logical name of the CMTS device. |
| **--direction=***up/down* | — | Specifies the direction of the virtual link. |
| **--prefix=***vlink prefix* | — | Specifies the virtual link prefix. |

*Table 5-2 p3vlink Options (continued)*

| SM Option | Abbreviation | Description |
|---|---|---|
| **--vlink-name=***vlink name* | — | Specifies the virtual link name. |
| **--vlink-id** | — | Specifies the index of the virtual link. |
| **--detail** | — | (Optional) To display additional information, use this option with the --show-device operation. |

# p3vlink Utility Examples

To show the CMTS device general configuration, CMTS device list, and CMTS device information:

```
p3vlink --show
General data:
-------------
        Start:                          Yes
        Monitor Every:                  60 minutes
        BW Up Factor                    95
        BW Down Factor                  95
        Next query operation:           Wed Nov 05 08:40:33 IST 2008
        Next ip removal operation:      Wed Nov 12 10:40:11 IST 2008
        Enable Device Learning:         true
        Upstream Global Controllers:    None
        Downstream Global Controllers: None
Device list
-----------
        1) Name: device, Host Name: Paris, Type Static, Query state: Completed, Last
successful query: Wed Nov 05 08:39:35 IST 2008

Command terminated successfully
>
```

To show the general configuration of a specified CMTS device:

```
p3vlink --show-device -d CMTS1 --detail
Name:                           CMTS1
Host Name:                      Paris
IP:                             192.0.2.10
Type:                           Static
SCE Related:                    sce0
Upstream factor:                95
Downstream factor:              95
Last success Query:             Thu Jun 19 17:54:48 IDT 2008
Last Query Attempt:             Thu Jun 19 17:54:48 IDT 2008
Last Query Status:              Completed
Sync state with SCE:            done
Sync state with CM:             done
Giaddr List:                    127.0.0.1
Upstream Global Controllers:    None
Downstream Global Controllers: <GC Name>=<GC Value>,<GC Name>=<GC Value>…
isLogAll:                       true
Num of up interfaces:           6
Num of down interfaces:         2
```

```
VLink Information:
1) Name: CMTS1_Cmts0/0-upstream2, Vlink Id: 1, Direction UP, PIR 5000 kbps.
2) Name: CMTS1_Cmts0/0-downstream1, Vlink Id:1, Direction DOWN, PIR 10000 kbps
       Channel Name: <vlink Name>-W, index <value>, PIR <value> kpbs, CIR <value> kpbs
       Channel Name: <vlink Name>-L<channel index>, index <value>, PIR <value> kpbs, CIR
<value> kpbs
3) Name: CMTS1_Cmts0/0-upstream3, Vlink Id:2, Direction UP, PIR 10000 kbps.
4) Name: CMTS1_Cmts1/0-downstream1, Vlink Id:2, Direction DOWN, PIR 20000 kbps.
5) Name: CMTS1_Cmts0/0-upstream1, Vlink Id:3, Direction UP, PIR 10000 kbps.
6) Name: CMTS1_Cmts1/0-upstream2, Vlink Id:4, Direction UP, PIR 20000 kbps.
7) Name: CMTS1_Cmts1/0-upstream3, Vlink Id:5, Direction UP, PIR 20000 kbps.
8) Name: CMTS1_Cmts1/0-upstream1, Vlink Id:6, Direction UP, PIR 20000 kbps.

Command terminated successfully
>
```

The output of this command includes the following four information elements:

- Num of up interfaces—Summarizes the total number of upstream virtual links related to this CMTS device. *Unknown* indicates that the VLM was not able to communicate with the CMTS device.
- Num of down interfaces—Summarizes the total number of downstream virtual links related to this CMTS device. *Unknown* indicates that the VLM was not able to communicate with the CMTS device.
- Sync state with SCE:
  - Done—The SCE is fully synchronized with CMTS device information. When working in cascade mode, both the active and standby SCEs are synchronized with CMTS device data.
  - Not-done—The SCE (or one of the SCEs in cascade mode) is not synchronized with all CMTS device data. Use the command **p3vlink --resync -n** <*sce which manages the device*> to perform the synchronization operation.
  - Sync-in-process—When VLM detects configuration changes, the change needs to be sent to the SCE. During the update process, the VLM changes the sync to Sync-in-process state.

    For successful updates, the SCE sync state is set to Done else the value is set to Not-Done.
- Sync state with CM:
  - Done—The CM is fully synchronized with CMTS device information.
  - Not-done—The CM is not synchronized with all CMTS device data. Use the command **p3vlink --resync -n** <*sce which manages the device*> to perform the synchronization operation.
  - N/A—The SCE to which the CMTS device belongs, is not connected to any CM.
  - Sync-in-process – When VLM detects configuration changes, the change needs to be sent to the CM. During the update process, the VLM changes the sync to Sync-in-process state.

    For successful updates, SCE sync state is set to Done else the value is set to Not-Done.
- Last Query Status:
  - Not started—Query operation for the device was not started since the last SM boot.
  - Completed—Last query was completed successfully.
  - Failure
  - Waiting for query—Query operation is in queue waiting for resources.
  - In-query—Device is in the process of a query operation.
  - Waiting For Deletion—During the last query, if no giaddr was found, the system queues up the device for deletion. This is applicable to dynamic devices only.

To show all the virtual links for a specific network element (SCE):

```
p3vlink --show-vlinks -n sc0
device0_0_Cmts0/1-downstream1, vlink id=15, direction=DOWN
device0_0_Cmts0/1-upstream1, vlink id=8, direction=UP
device0_0_Cmts0/1-upstream2, vlink id=16, direction=DOWN
device0_1_Cmts1/1-downstream1, vlink id=11, direction=DOWN
device0_1_Cmts1/1-upstream1, vlink id=6, direction=UP
device0_1_Cmts1/1-upstream2, vlink id=12, direction=DOWN
device0_2_Cmts2/1-downstream1, vlink id=25, direction=DOWN
device0_2_Cmts2/1-upstream1, vlink id=13, direction=UP
device0_2_Cmts2/1-upstream2, vlink id=26, direction=DOWN
device0_3_Cmts3/1-downstream1, vlink id=13, direction=DOWN
device0_3_Cmts3/1-upstream1, vlink id=7, direction=UP
device0_3_Cmts3/1-upstream2, vlink id=14, direction=DOWN
device0_4_Cmts4/1-downstream1, vlink id=21, direction=DOWN
device0_4_Cmts4/1-upstream1, vlink id=11, direction=UP
device0_4_Cmts4/1-upstream2, vlink id=22, direction=DOWN
device0_5_Cmts5/1-downstream1, vlink id=1, direction=DOWN
device0_5_Cmts5/1-upstream1, vlink id=1, direction=UP
device0_5_Cmts5/1-upstream2, vlink id=2, direction=DOWN
device0_6_Cmts6/1-downstream1, vlink id=9, direction=DOWN
device0_6_Cmts6/1-upstream1, vlink id=5, direction=UP
device0_6_Cmts6/1-upstream2, vlink id=10, direction=DOWN
device1_0_Cmts7/1-downstream1, vlink id=3, direction=DOWN
device1_0_Cmts7/1-upstream1, vlink id=2, direction=UP
device1_0_Cmts7/1-upstream2, vlink id=4, direction=DOWN
device1_1_Cmts8/1-downstream1, vlink id=7, direction=DOWN
device1_1_Cmts8/1-upstream1, vlink id=4, direction=UP
device1_1_Cmts8/1-upstream2, vlink id=8, direction=DOWN
device1_2_Cmts9/1-downstream1, vlink id=27, direction=DOWN
device1_2_Cmts9/1-upstream1, vlink id=14, direction=UP
device1_2_Cmts9/1-upstream2, vlink id=28, direction=DOWN
device1_3_Cmts10/1-downstream1, vlink id=23, direction=DOWN
device1_3_Cmts10/1-upstream1, vlink id=12, direction=UP
device1_3_Cmts10/1-upstream2, vlink id=24, direction=DOWN
device1_4_Cmts11/1-downstream1, vlink id=19, direction=DOWN
device1_4_Cmts11/1-upstream1, vlink id=10, direction=UP
device1_4_Cmts11/1-upstream2, vlink id=20, direction=DOWN
device1_5_Cmts12/1-downstream1, vlink id=5, direction=DOWN
device1_5_Cmts12/1-upstream1, vlink id=3, direction=UP
device1_5_Cmts12/1-upstream2, vlink id=6, direction=DOWN
device1_6_Cmts13/1-downstream1, vlink id=17, direction=DOWN
device1_6_Cmts13/1-upstream1, vlink id=9, direction=UP
device1_6_Cmts13/1-upstream2, vlink id=18, direction=DOWN
Command terminated successfully
```

To show the vlink data of a specific link:

```
p3vlink --show-vlink-data --vlink-name=device_Cmts0/0-downstream1
VLink Name: device_Cmts0/0-downstream1
VLink Id:    1
Direction:    downstream
SCE Name:     sce0
Device Name:  device
PIR:     200000000


Channels related to VLink
<name>-L, index <index>, PIR <value>, CIR <value>
<name>-W, index <index>, PIR <value>, CIR <value>
```

```
Related upstream virtual links —Lists all upstream interface related to the same MAC layer
as the selected downstream interface.
device_Cmts0/0-upstream0
device_Cmts0/0-upstream1
device_Cmts0/0-upstream2
device_Cmts0/0-upstream3
```

**Note** If more than one vlink has the same name, this command displays the information for all the vlinks.

To show the subscribers using virtual links:

- Use the **p3subsdb** command to list all the subscribers:

```
p3subsdb --show-all
lynn_jones
Command terminated successfully
>
```

- Use the **p3subs** command to show the virtual links of a particular subscriber:

```
p3subs --show -s lynn_jones
Name:           lynn_jones
Domain:         subscribers
Mappings:
        IP: 1.1.1.13/32
Properties:
        downVlinkId=7    Name=device1_1_Cmts8/1-downstream1
        upVlinkId=4      Name=device1_1_Cmts8/1-upstream1
Custom Properties:
        giaddr=1.1.1.1
Command terminated successfully
>
```

- Use the **p3vlink** command to show the subscribers that are associated with a particular CMTS device:

```
p3vlink --show-subs -d device1_1
Subscribers related to device: device1_1 vlink-id: 4, giaddr: 1.1.1.1, direction UP
lynn_jones
Subscribers related to device: device1_1 vlink-id: 7, giaddr: 1.1.1.1, direction DOWN
lynn_jones
Command terminated successfully
>
```

- Use the **p3vlink** command to show the subscribers that are associated with a particular channel:

```
p3vlink --show-subs -d Test0 --direction=Down --vlink-id=23
Subscribers related to device: Test0 vlink-id: 23, giaddr: 24.191.128.17, direction
DOWN010101010106010101010107
Command terminated successfully

p3vlink --show-subs --vlink-name test1_Cmts0/0-upstream2
Subscribers related to device: test1 vlink-id: 5, giaddr: 10.78.233.149, direction UP
010101010101
1 subscriber was found
Command terminated successfully
>
```

# Monitoring Virtual Links Using the SCE CLI

The SCE provides CLI commands to monitor the virtual links in the solution.

Table 5-3 lists the virtual links CLI commands.

*Table 5-3 Virtual Links Commands*

| Commands | Description |
|---|---|
| Show Commands | |
| **show interface LineCard 0 virtual-links [all \| changed \| different-from-template]** | This command has three uses:<br>• To display all the defined virtual links, use the **all** option.<br>• To display virtual links whose configurations have changed from the template, use the **changed** option.<br>• To display virtual links configurations that differ from the template, use the **different-from-template** option. |
| **show interface LineCard 0 virtual-links [status \| mapping]** | Displays the status of virtual links and updates the log with virtual links mapping.<br>To display the status of the virtual link, use the **status** option.<br>To update the log with virtual link mapping, use the **mapping** option.<br>This is a debug command. |
| **show interface LineCard 0 virtual-links template [direction [upstream \| downstream]]** | Displays the virtual link template of both upstream and downstream<br>(Optional) To show only one direction, use the **[direction [upstream \| downstream]]** option. |
| **show interface LineCard 0 virtual-links default direction [upstream \| downstream] [counter \| agc-mapping]** | Displays the default virtual link.<br>(Optional) To specify the agc-mapping between virtual link and the actual agc indexes, use the **agc-mapping** option.<br>(Optional) To specify the counter along with agc-mapping, enforce rate and actual rate, use the **counter** option. |
| **show interface LineCard 0 virtual-links [name <name> \| index <index>] direction [upstream \| downstream] [counter \| agc-mapping]** | Displays the virtual link by name or index.<br>To display the name or index of the virtual link, use the **[name <name> \| index <index>]** option.<br>(Optional) To specify the agc-mapping between virtual link and the actual agc indexes, use the **agc-mapping** option.<br>(Optional) To specify the counter along with agc-mapping, enforce rate and actual rate, use the **counter** option. |
| Add Commands | |
| **virtual-links index <index> direction [upstream \| downstream]** | Adds a virtual link index.<br>(Optional) To specify a direction, use the **[direction [upstream \| downstream]]** option. |

*Table 5-3 Virtual Links Commands (continued)*

| Commands | Description |
|---|---|
| **virtual-links index <index> name <name> direction [upstream \| downstream]** | Adds a virtual link index and specifies a name<br>To specify a name for the channel, use the **name** option.<br>(Optional) To specify a direction, use the **[direction [upstream \| downstream]]** option. |
| Remove Commands | |
| **no Virtual-links index <index> direction [upstream \| downstream]** | Removes a virtual link associated with the specified index and direction<br>To specify the index, use the **<index>** option.<br>To specify the direction, use the **direction** option. |
| **no Virtual-links all direction [upstream \| downstream]** | Removes all the virtual links. |
| Set Commands | |
| **virtual-links index <index> direction [upstream \| downstream] gc <offset> set-PIR value <value>** | Sets the virtual link index pir values by gc-offset and direction |
| Reset Commands | |
| **virtual-links index <index> direction [upstream \| downstream] gc <offset> reset-PIR** | Resets the virtual link index pir value by gc template offset and direction to template values. |

# virtual-links Command Examples

The following examples show the output from the CLI virtual links commands.

```
SCE2000#> show interface Linecard 0 virtual-links template
Virtual Link enabled
Global Virtual link Global Controller, upstream:
    name = globalGC - pir: 8000000 - cir: 0 - al: 5
    name = globalGC1 - pir: 8000000 - cir: 0 - al: 5
Virtual link Global Controller, upstream Template hierarchic:
Total bandwidth limit in Virtual-Link:
    name = Virtual-Link Global Controller - pir: 8000000,8000000,8000000,8000000 - cir: 0
    - al: 5
    name = appGC - pir: 8000000,8000000,8000000,8000000 - cir: 0 - al: 5
    Global Virtual link Global Controller, downstream:
    name = globalGC1 - pir: 8000000 - cir: 0 - al: 5
Virtual link Global Controller, downstream Template hierarchic:
Total bandwidth limit in Virtual-Link:
    name = Virtual-Link Global Controller - pir: 8000000,8000000,8000000,8000000 - cir: 0
    - al: 5
    name = appGC - pir: 8000000,8000000,8000000,8000000 - cir: 0 - al: 5
    name = appGC1 - pir: 8000000,8000000,8000000,8000000 - cir: 0 - al: 5
    name = appGC2 - pir: 8000000,8000000,8000000,8000000 - cir: 0 - al: 5

SCE2000#> show interface LineCard 0 virtual-links all
Virtual Link enabled
upstream Virtual-Link:
index=1, name=virtual link 1
index=2, name=virtual link 2
index=3, name=virtual link 3
downstream Virtual-Link:
```

```
index=1, name=virtual link 1
index=2, name=virtual link 2
index=3, name=virtual link 3

SCE2000#> show interface LineCard 0 virtual-links different-from-template
Virtual Link enabled
upstream Virtual-Link:
    virtual index=1, name=virtual link 1
        channel index=1, name=virtual channel 1, pir=99999, cir=99, al=9, agc index=3
        application index=1, name=appGC-1, pir=8000000, cir=0, al=5, agc index=2
    virtual index=2, name=virtual link 2
        channel index=2, name=virtual channel 2, pir=99999, cir=99, al=9, agc index=7
        application index=1, name=appGC-2, pir=8000000, cir=0, al=5, agc index=6
downstream Virtual-Link:
    virtual index=3, name=virtual link 3
        channel index=3, name=virtual channel 3, pir=99999, cir=99, al=9, agc index=15
        application index=1, name=appGC-3, pir=8000000, cir=0, al=5, agc index=12
        application index=2, name=appGC1-3, pir=8000000, cir=0, al=5, agc index=13
        application index=3, name=appGC2-3, pir=8000000, cir=0, al=5, agc index=14

SCE8000#> show interface LineCard 0 virtual-links index 1 direction upstream agc-mapping
Virtual Link enabled
upstream Virtual-Link:
    virtual index=1, name=virtual link 1
        channel index=1, name=virtual channel 1, pir=99999, cir=99, al=9, agc index=3
        application index=1, name=appGC-1, pir=8000000, cir=0, al=5, agc index=2

SCE8000#> show interface LineCard 0 virtual-links index 1 direction upstream counter
Virtual Link enabled
upstream Virtual-Link:
    virtual index=1, name=virtual link 1
        channel index=1, name=virtual channel 1, pir=99999, cir=99, al=9, agc index=3,
        enforce rate=99999, actual rate=0
        application index=1, name=appGC-1, pir=8000000, cir=0, al=5, agc index=2, enforce
        rate=8000000, actual rate=0
```

# Monitoring Virtual Links Using the Reporter

The Service Control Application for Broadband (SCA BB) includes a Reporter tool that allows you to produce reports based on the traffic analysis performed by the SCE platform. The information is sent from the SCE platform and is stored in a database. The Reporter can query and retrieve information from the database and present the results in a comprehensive range of reports.

The Reporter includes the Virtual Links Monitoring group of report templates that allow you to view statistics of bandwidth or volume of traffic used by a virtual link. The reports are provided per service usage counter for the total volume used by the virtual link. The volume consumption can be displayed per service for the virtual link. The reports are provided per channel.

Each report can be filtered to focus on a virtual link ID, a virtual link name, a virtual link direction, or a combination of the virtual link identifiers.

The Virtual Links Monitoring group includes the following report templates:

- VLink Bandwidth per Service—Shows the distribution of bandwidth among the different service usage counters defined in the system for all subscribers.
- VLink Aggregated Usage Volume per Service—Shows the total volume of traffic (upstream and downstream) for each service usage counter.

- VLink Bandwidth per Package—Shows the distribution of bandwidth among the different packages defined in the system for selected vlinks.
- VLink Hourly Usage Volume per Service—Shows the distribution of volume among the different service usage counters defined in the system, grouped by hour.
- VLink Daily Usage Volume per Service—Shows the distribution of volume among the different service usage counters defined in the system, grouped by day.
- Daily Peak BW for all VLinks—Shows the daily value of the maximum bandwidth (1-hour or 2-hour average) for all virtual links.
- Total Active Subscribers per VLink—Shows the number of active subscribers for a selected vlink.
- VLink Bandwidth per Channel—Shows the distribution of bandwidth among the different channels for selected vlinks.
- Top Subscribers per VLink—Shows a list of the top subscriber volume consumption in a specific hour or day for a selected Vlink.
- Average Bandwidth per Subscribers per VLink—Shows the average bandwidth for a specific subscriber for a selected vlink.
- Accumulated Bandwidth Distribution per VLink—Shows the accumulated bandwidth distribution for a selected vlink.

# Creating a New Report Instance

**Step 1** Go to the SCA BB console. From the Tools menu, choose **Reporter**.

The Reporter opens and the Templates tab appears.

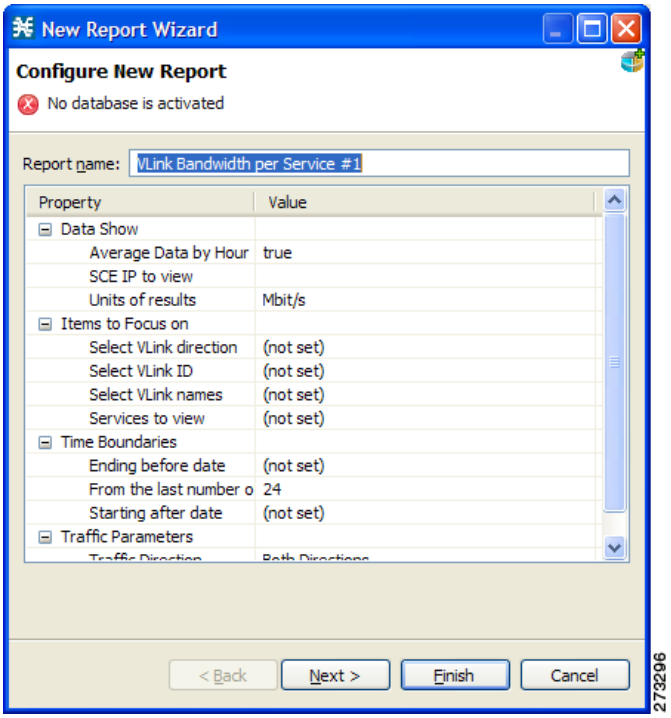
**Step 2** In Templates view, expand the Virtual Links Monitoring group.

**Step 3** Right-click a report instance (for example, VLink Bandwidth per Service).

A popup menu appears.

**Step 4** From the menu, choose **New**.

The New Report Wizard dialog box appears, allowing you to configure the new report.




**Step 5** In the Report name field, enter the name of the report instance.

The default report name is **VLink Bandwidth per Service #1**. (If you create another report instance from this report template, it is named **VLink Bandwidth per Service #2**, and so on. You can rename report instances.)

**Step 6** To create a report that focuses on a particular CMTS device:

**a.** In the Select VLink names row, click the right column and click the **Browse** button that appears.

**b.** Click the **Search** button.

In the search box, enter the name of the CMTS device with a * before and after; for example *CMTS_1*

All the virtual links that contain the string ‘CMTS_1’ appear.

**c.** Select all the results and click **OK**.

The report is produced that focuses on the specified CMTS device.