Configuring an SLM

Synthetic loss measurement (SLM) is part of the ITU-T Y.1731 standard. It can be used to periodically measure Frame Loss and Forward Loss Ratio (FLR) between a pair of point to point MEPs. Measurements are made between two MEPs that belong to the same domain and MA.

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Configuring SLM over VPLS

This section describes the procedure for configuring SLM over VPLS.

Note The EVC name is mandatory in the VPLS configuration methods.

Procedure

Step 1 Configure CFM on PE Device

For configuration details, see Configuring Ethernet Connectivity Fault Management in a Service Provider Network. In case of H-VPLS configuration, see CFM Configuration over EFP Interface with Cross Connect Feature.

Step 2 Configure CFM over VPLS using **l2 vfi** *vfi-name* **manual** *evc* command or **l2vpn vfi context** *vfi-name* command.

The evc should be the EVC name used in the CFM on PE device configuration. For configuration details, see Configuring the VFI in the PE.

Note The EVC name is mandatory in both the above mentioned VPLS configuration methods.

Step 3 Configure a Sender MEP (optional task).

For configuration details, see Configuring a Sender MEP for a Single-Ended Ethernet Frame Loss Ratio Operation.

Restrictions for SLM support over VPLS

- Only Up MEP (Maintenance End Point) on EVC (ethernet virtual circuit) BD (bridge domain) with VPLS towards the core is supported. Down MEP on VFI is not supported.
- To send unicast packets (LBR, LTM/R, Y1731 packets), port-emulation method is used. The access interface (the interface where Up MEP is configured) needs to be up to send unicast packets.
- SLM is not supported with TEFP in access.
- SLM scales with frame interval of 100ms.

Configuring an SLM

To configure an SLM, execute the following commands:

Procedure

Step 1 **enable**

Example:

```
Router > enable
```

Enables privileged EXEC mode.

- Enter your password if prompted.

Step 2 **configure terminal** *operation number*

—Identifies the IP SLAs' operation you want to configure.

Example:

```
Device# configure terminal
```

Enters global configuration mode.

Step 3 **ip sla** *operation number*

Example:

```
Router(config)# ip sla 11
```

Configures an IP SLA operation and enters IP SLA configuration mode.

- *operation-number*—Identifies the IP SLAs' operation you want to configure.

Step 4 **ethernet y1731 loss SLM domain** *domain-name* {**evc** *evc-id* | **vlan** *vlan-id*} {**mpid** *target-mp-id* | **mac-address**-*target -address*}**cos** *cos*{**source**{**mpid** *source-mp-id* | **mac-address** *source-address*}}

Example:

```
Router(config-ip-sla)# ethernet y1731 loss SLM domain xxx evc yyy mpid 101 cos 4 source
mpid 100
```

Configures a single-ended synthetic loss measurement and enters IP SLA Y.1731 loss configuration mode.

- **EVC**—Specifies the ethernet virtual circuit name.
- **SLM**—Specifies that the frames sent are Synthetic Loss Measurement (SLM) frames.
- **domain** *domain-name*—Specifies the name of the Ethernet Connectivity Fault Management (CFM) maintenance domain.
- **vlan** *vlan-id*—Specifies the VLAN identification number. The range is from 1 to 4094.
- **mpid** *target-mp-id*—Specifies the maintenance endpoint identification numbers of the MEP at the destination. The range is from 1 to 8191.
- **mac-address** *target-address*—Specifies the MAC address of the MEP at the destination.
- **cos** *cos*—Specifies, for this MEP, the class of service (CoS) that will be sent in the Ethernet message. The range is from 0 to 7.
- **source**—Specifies the source MP ID or MAC address.
- **mpid** *source-mp-id*—Specifies the maintenance endpoint identification numbers of the MEP being configured. The range is from 1 to 8191.
- **mac-address** *source-address*—Specifies the MAC address of the MEP being configured.

Step 5 **aggregate interval** *seconds*

Example:

```
Router(config-sla-y1731-loss)# aggregate interval 900
```

(Optional) Configures the length of time during which the performance measurements are conducted and the results stored.

- *seconds*—Specifies the length of time in seconds. The range is from 1 to 65535. The default is 900.

Step 6 **availability algorithm**{ **sliding-window** | **static-window 1**} **symmetric**

Example:

```
Router(config-sla-y1731-loss)# availability algorithm static-window
```

(Optional) Specifies availability algorithm used.

- **sliding-window**—Specifies a sliding-window control algorithm.
- **static-window**—Specifies static-window control algorithm.

Step 7 **frame consecutive** *value*

Example:

```
Router(config-sla-y1731-loss)# frame consecutive 10.
```

(Optional) Specifies number of consecutive measurements to be used to determine availability or unavailability status.

- *value*—Specifies the number of consecutive measurements. The range is from 1 to 10. The default is 10.

Step 8 **frame interval** *milliseconds*

Example:

```
Router(config-sla-y1731-loss)# frame interval 1000
```

(Optional) Sets the gap between successive frames.

- *milliseconds*—Specifies the length of time in milliseconds (ms) between successive synthetic frames. The default is 1000

Step 9 **frame size** *bytes*

Example:

```
Router(config-sla-y1731-loss)# frame size 64
```

(Optional) Configures padding size for frames.

- *bytes*—Specifies the padding size, in four-octet increments, for the synthetic frames. The default is 64.

Step 10 **history interval** *intervals-stored*

Example:

```
Router(config-sla-y1731-loss)# history interval 2
```

(Optional) Sets the number of statistics distributions kept during the lifetime of an IP SLAs Ethernet operation.

- *intervals-stored*—Specifies the number of statistics distributions. The range is from 1 to 10. The default is 2.

Step 11 **owner** *owner-id*

Example:

```
Router(config-sla-y1731-loss)# owner admin
```

(Optional) Configures the owner of an IP SLAs operation.

- *owner-id*—Specified the name of the SNMP owner. The value is from 0 to 255 ASCII characters.

Step 12 **exit**

Example:

```
Router(config-sla-y1731-loss)# exit
```

Exits IP SLA Y.1731 loss configuration mode and enters IP SLA configuration mode.

Step 13 **ip sla reaction-configuration** *operation-number* [**react** {**unavailableDS** |**unavailableSD** | **loss-ratioDS** | **loss-ratioSD**}] [**threshold-type** {**average** [*number -of-measurements*] | **consecutive** [*occurences*] | **immediate**}] [**threshold-value** *upper -threshold lower-threshold*]

Example:

```
Router(config)# ip sla reaction-configuration 11 react unavailableDS
```

(Optional) Configures proactive threshold monitoring for frame loss measurements.

- *operation-number*—Identifies the IP SLAs operation for which reactions are to be configured.
- **react**—(Optional) Specifies the element to be monitored for threshold violations.
- **unavailableDS**—Specifies that a reaction should occur if the percentage of destination-to-source Frame Loss Ratio (FLR) violates the upper threshold or lower threshold.
- **unavailableSD**—Specifies that a reaction should occur if the percentage of source-to-destination FLR violates the upper threshold or lower threshold.
- **loss-ratioDS**—Specifies that a reaction should occur if the one-way destination-to-source loss-ratio violates the upper threshold or lower threshold.
- **loss-ratioSD**—Specifies that a reaction should occur if the one way source-to-destination loss-ratio violates the upper threshold or lower threshold.
- **threshold-type average**[*number-of-measurements*]—(Optional) When the average of a specified number of measurements for the monitored element exceeds the upper threshold or when the average of a specified number of measurements for the monitored element drops below the lower threshold, perform the action defined by the action-type keyword. The default number of 5 averaged measurements can be changed using the number-of-measurements argument. The range is from 1 to 16.
- **threshold-type consecutive**[*occurrences*] —(Optional) When a threshold violation for the monitored element is met consecutively for a specified number of times, perform the action defined by the action-type keyword. The default number of 5 consecutive occurrences can be changed using the occurrences argument. The range is from 1 to 16.
- **threshold-type immediate**—(Optional) When a threshold violation for the monitored element is met, immediately perform the action defined by the **action-type** keyword.
- **threshold-value***upper-threshold lower-threshold*—(Optional) Specifies the upper-threshold and lower-threshold values of the applicable monitored elements.

Step 14 **ip sla logging traps**

Example:

```
Router(config)# ip sla logging traps
```

(Optional) Enables IP SLAs syslog messages from CISCO-RTTMON-MIB.

Step 15 **exit**

Example:

```
Router(config)# exit
```

Exits global configuration mode and enters privileged EXEC mode.

What to do next

Once the SLM is configured, you have to schedule an IP SLA operation.

Scheduling an IP SLA Operation

To schedule an IP SLA operation, execute the following commands:

Procedure

Step 1 **enable**

Example:

```
Router> enable
```

Enables the privileged EXEC mode.

Enter your password if prompted.

Step 2 **configure terminal**

Example:

```
Router# configure terminal
```

Enters the global configuration mode.

Step 3 **ip sla schedule** *operation-number* [**life** { **forever** | *seconds* }] [**start-time** {*hh* **:** *mm* [**:** *ss*] [*month day* | *day month*] | **pending** | **now** | **after** *hh* **:** *mm* **:** *ss* | **random** *milliseconds*}]

Example:

```
Router(config)# ip sla schedule 10 start-time now life forever
```

Configures the scheduling parameters for an individual IP SLA operation or Specifies an IP SLA operation group number and the range of operation numbers to be scheduled for a multi-operation scheduler.

- *operation-number*—Identifies the IP SLAs operation for which reactions are to be configured.
- **life forever**— (Optional) Schedules the operation to run indefinitely.
- **life** *seconds* —(Optional) Number of seconds the operation actively collects information. The default is 3600 seconds (one hour).
- **start-time** —(Optional) Time when the operation starts.
- *hh***:***mm*[**:***ss*]—Specifies an absolute start time using hour, minute, and (optionally) second. Use the 24-hour clock notation. For example, start-time 01:02 means “start at 1:02 a.m.,” and start-time 13:01:30 means “start at 1:01 p.m. and 30 seconds.” The current day is implied unless you specify a month and day.
- *month* —(Optional) Name of the month to start the operation in. If month is not specified, the current month is used. Use of this argument requires that a day be specified. You can specify the month by using either the full English name or the first three letters of the month.
- *day* —(Optional) Number of the day (in the range 1 to 31) to start the operation on. If a day is not specified, the current day is used. Use of this argument requires that a month be specified.
- **pending** —(Optional) No information is collected. This is the default value.

- **now** —(Optional) Indicates that the operation should start immediately.
- **after** *hh*:*mm*:*ss*—(Optional) Indicates that the operation should start hh hours, mm minutes, and ss seconds after this command was entered.
- **random** *milliseconds*—(Optional) Adds a random number of milliseconds (between 0 and the specified value) to the current time, after which the operation will start. The range is from 0 to 10000.

Step 4 **exit**

Example:

```
Router(config)# exit
```

Exits the global configuration mode and enters the privileged EXEC mode.

Configuration Example for SLM over VPLS

This section lists the CLIs and their corresponding outputs of SLM configuration over VPLS that are generated.

- **sh run | i evc**

```
ethernet evcEVC_100
```

- **sh run | sec cfm**

```
ethernet cfm global
ethernet cfm domain CFM-VPLS level 5
service ser1 evc EVC_100 vlan 100
continuity-check
continuity-check interval 1s
```

- **sh run | sec 12 vfi**

```
l2 vfi VPLS-CFM manual EVC_100
vpn id 100
bridge-domain 100
neighbor 2.2.2.2 encapsulation mpls
```

- **sh run int g0/4/4**

```
interface GigabitEthernet0/4/4
service instance 100 ethernet EVC_100
encapsulation dot1q 100

cfm mep domain CFM-VPLS mpid 1001
bridge-domain 100
```

- **sh run | sec ip sla**

```
ip sla 200
ethernet y1731 loss SLM domain CFM-VPLS evc EVC_100 mpid 1002 cos 7 source mpid 1001
ip sla schedule 200 start-time now
```