



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.

- [Configuring SLM over VPLS, page 1](#)
- [Restrictions for SLM support over VPLS, page 2](#)
- [Configuring an SLM, page 2](#)
- [Configuration Example for SLM over VPLS, page 7](#)

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.

SUMMARY STEPS

1. Configure CFM on PE Device
2. Configure CFM over VPLS using `I2 vfi vfi-name manual evc` command or `I2vpn vfi context vfi-name` command.
3. Configure a Sender MEP (optional task).

DETAILED STEPS

	Command or Action	Purpose
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 .

	Command or Action	Purpose
Step 2	Configure CFM over VPLS using I2 vfi vfi-name manual evc command or I2vpn 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 TEF in access.
- SLM scales with frame interval of 100ms.

Configuring an SLM

To configure an SLM, execute the following commands:

SUMMARY STEPS

1. **enable**
2. **configure terminal** *operation number*
3. **ip sla** *operation number*
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*}}
5. **aggregate interval** *seconds*
6. **availability algorithm** { **sliding-window** | **static-window** **1** } **symmetric**
7. **frame consecutive** *value*
8. **frame interval** *milliseconds*
9. **framesize** *bytes*
10. **history interval** *intervals-stored*
11. **owner** *owner-id*
12. **exit**
13. **exit**
14. **ip sla reaction-configuration** *operation-number* [**react** {**unavailableDS** | **unavailableSD** | **loss-ratioDS** | **loss-ratioSD**}] [**threshold-type** {**average** [*number-of-measurements*] | **consecutive** [*occurrences*] | **immediate**}] [**threshold-value** *upper-threshold lower-threshold*]
15. **ip sla logging traps**
16. **exit**

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable Example: Router > enable	Enables privileged EXEC mode. • Enter your password if prompted.
Step 2	configure terminal <i>operation number</i> Example: Device# configure terminal	—Identifies the IP SLAs' operation you want to configure. Enters global configuration mode.
Step 3	ip sla <i>operation number</i> Example: Router(config)# ip sla 11	Configures an IP SLA operation and enters IP SLA configuration mode. • <i>operation-number</i> —Identifies the IP SLAs' operation you want to configure.
Step 4	ethernet y1731 loss SLM domain <i>domain-name</i> { evc <i>evc-id</i> vlan <i>vlan-id</i> } { mpid <i>target-mp-id</i>	Configures a single-ended synthetic loss measurement and enters IP SLA Y.1731 loss configuration mode.

	Command or Action	Purpose
	<p>mac-address <i>target-address</i> } cos <i>cos</i> { source { mpid <i>source-mp-id</i> mac-address <i>source-address</i> } }</p> <p>Example:</p> <pre>Router(config-ip-sla)# ethernet y1731 loss SLM domain xxx evc yyy mpid 101 cos 4 source mpid 100</pre>	<ul style="list-style-type: none"> • SLM—Specifies that the frames sent are Synthetic Loss Measurement (SLM) frames. • domain <i>domain-name</i>—Specifies the name of the Ethernet Connectivity Fault Management (CFM) maintenance domain. • vlan <i>vlan-id</i>—Specifies the VLAN identification number. The range is from 1 to 4096. • mpid <i>target-mp-id</i>—Specifies the maintenance endpoint identification numbers of the MEP at the destination. The range is from 1 to 8191. • mac-address <i>target-address</i>—Specifies the MAC address of the MEP at the destination. • cos <i>cos</i>—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 <i>source-mp-id</i>—Specifies the maintenance endpoint identification numbers of the MEP being configured. The range is from 1 to 8191. • mac-address <i>source-address</i>—Specifies the MAC address of the MEP being configured.
Step 5	<p>aggregate interval <i>seconds</i></p> <p>Example:</p> <pre>Router(config-sla-y1731-loss)# aggregate interval 900</pre>	<p>(Optional) Configures the length of time during which the performance measurements are conducted and the results stored.</p> <ul style="list-style-type: none"> • seconds—Specifies the length of time in seconds. The range is from 1 to 65535. The default is 900.
Step 6	<p>availability algorithm { sliding-window static-window 1 } symmetric</p> <p>Example:</p> <pre>Router(config-sla-y1731-loss)# availability algorithm static-window</pre>	<p>(Optional) Specifies availability algorithm used.</p> <ul style="list-style-type: none"> • sliding-window—Specifies a sliding-window control algorithm. • static-window—Specifies static-window control algorithm.
Step 7	<p>frame consecutive <i>value</i></p> <p>Example:</p> <pre>Router(config-sla-y1731-loss)# frame consecutive 10.</pre>	<p>(Optional) Specifies number of consecutive measurements to be used to determine availability or unavailability status.</p> <ul style="list-style-type: none"> • value—Specifies the number of consecutive measurements. The range is from 1 to 10. The default is 10.
Step 8	<p>frame interval <i>milliseconds</i></p> <p>Example:</p> <pre>Router(config-sla-y1731-loss)# frame interval 100</pre>	<p>(Optional) Sets the gap between successive frames.</p> <ul style="list-style-type: none"> • milliseconds—Specifies the length of time in milliseconds (ms) between successive synthetic frames. The range is from 100 to 10000. The default is 1000.

	Command or Action	Purpose
Step 9	framesize <i>bytes</i> Example: <pre>Router(config-sla-y1731-loss)# frame size 32</pre>	(Optional) Configures padding size for frames. <ul style="list-style-type: none"> • <i>bytes</i>—Specifies the padding size, in four-octet increments, for the synthetic frames. The range is from 64 to 384. The default is 64.
Step 10	history interval <i>intervals-stored</i> Example: <pre>Router(config-sla-y1731-loss)# history interval 2</pre>	(Optional) Sets the number of statistics distributions kept during the lifetime of an IP SLAs Ethernet operation. <ul style="list-style-type: none"> • <i>intervals-stored</i>—Specifies the number of statistics distributions. The range is from 1 to 10. The default is 2.
Step 11	owner <i>owner-id</i> Example: <pre>Router(config-sla-y1731-loss)# owner admin</pre>	(Optional) Configures the owner of an IP SLAs operation. <ul style="list-style-type: none"> • <i>owner-id</i>—Specified the name of the SNMP owner. The value is from 0 to 255 ASCII characters.
Step 12	exit Example: <pre>Router(config-sla-y1731-loss)# exit</pre>	Exits IP SLA Y.1731 loss configuration mode and enters IP SLA configuration mode.
Step 13	exit Example: <pre>Router(config-ip-sla)# exit</pre>	(Optional) Configures proactive threshold monitoring for frame loss measurements.
Step 14	ip sla reaction-configuration <i>operation-number</i> [react { unavailableDS unavailableSD loss-ratioDS loss-ratioSD }] [threshold-type { average [<i>number -of-measurements</i>] consecutive [<i>occurrences</i>] immediate }] [threshold-value <i>upper -threshold lower-threshold</i>] Example: <pre>Router(config)# ip sla reaction-configuration 11 react unavailableDS</pre>	(Optional) Configures proactive threshold monitoring for frame loss measurements. <ul style="list-style-type: none"> • <i>operation-number</i>—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.

	Command or Action	Purpose
		<ul style="list-style-type: none"> • 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[<i>number-of-measurements</i>]—(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[<i>occurrences</i>]—(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<i>upper-threshold lower-threshold</i>—(Optional) Specifies the upper-threshold and lower-threshold values of the applicable monitored elements.
Step 15	ip sla logging traps Example: Router(config)# ip sla logging traps	(Optional) Enables IP SLAs syslog messages from CISCO-RTTMON-MIB.
Step 16	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:

SUMMARY STEPS

1. **enable**
2. **configure terminal**
3. **ip sla schedule *operation-number* start-time now ip sla schedule *operation-number***
4. **exit**

DETAILED STEPS

	Command or Action	Purpose
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 <i>operation-number</i> start-time now ip sla schedule <i>operation-number</i> Example: Router(config)# ip sla schedule 10 start-time now Example: Router(config)# ip sla group schedule 1 3,4,6-9	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.
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**

```
12 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
```