PBB Service Commands

VPLS Service Commands

vpls

Syntax **vpls** *service-id* **customer** *customer-id* **vpn** *vpn-id* [**m-vpls**] [**b-vpls | i-vpls**] [**create**]
vpls *service-id*
no vpls *service-id*

Context config>service

Description This command creates or edits a Virtual Private LAN Services (VPLS) instance. The **vpls** command is used to create or maintain a VPLS service. If the *service-id* does not exist, a context for the service is created. If the *service-id* exists, the context for editing the service is entered.

A VPLS service connects multiple customer sites together acting like a zero-hop, layer 2 switched domain. A VPLS is always a logical full mesh.

When a service is created, the **create** keyword must be specified if the **create** command is enabled in the **environment** context. When a service is created, the **customer** keyword and *customer-id* must be specified and associates the service with a customer. The *customer-id* must already exist having been created using the **customer** command in the service context. Once a service has been created with a customer association, it is not possible to edit the customer association. The service must be deleted and recreated with a new customer association.

Once a service is created, the use of the **customer** *customer-id* is optional for navigating into the service configuration context. Attempting to edit a service with the incorrect *customer-id* specified will result in an error.

More than one VPLS service may be created for a single customer ID.

By default, no VPLS instances exist until they are explicitly created.

The **no** form of this command deletes the VPLS service instance with the specified *service-id*. The service cannot be deleted until all SAPs and SDPs defined within the service ID have been shutdown and deleted, and the service has been shutdown.

service-id — The unique service identification number identifying the service in the service domain. This ID must be unique to this service and may not be used for any other service of any type. The *service-id* must be the same number used for every SR OS router on which this service is defined.

Values 1 — 2147483648

customer *customer-id* — Specifies the customer ID number to be associated with the service. This parameter is required on service creation and optional for service editing or deleting.

Values 1 — 2147483647

vpn *vpn-id* — Specifies the VPN ID number which allows you to identify virtual private networks (VPNs) by a VPN identification number.

Values 1 — 2147483647

Default **null** (0)

m-vpls — Specifies a management VPLS.

b-vpls | i-vpls — Creates a backbone-vpls or ISID-vpls for use with PBB

eth-tunnel

Syntax **eth-tunnel** *tunnel-id*

Context config>service>vpls

Description This command associates a BVPLS SAP with the global Ethernet tunnel object specified by tunnel-id. Only one-to-one mapping between SAP and Ethernet tunnel is supported in the initial implementation. The global eth-tunnel tunnel-id with at least a member port must be configured in advance for the command to be successful. A SAP will be instantiated using the active path components (member port and control-tag) for VPLS forwarding. The last member port in the Ethernet Tunnel cannot be deleted if there is a SAP configured on that eth-tunnel. This command is only available in the BVPLS context.

The **no** form of this command removes the sap from the Ethernet tunnel object.

Default no sap is specified

Parameters *tunnel-id* — Specifies the value of the Ethernet tunnel identifier to be used for the SAP.

Values 1-64

spb

Syntax [**no**] **spb** *instance* [**fid** *value*] [**create**]

Context config>service>vpls b-vpls
config>service>vpls b-vpls>sap>spb
config>service>vpls b-vpls>spoke-sdp>spb

Description This command enables Shortest Path Bridging (SPB) on a B-VPLS instance. SPB uses IS-IS that supports multiple instances, therefore an instance must be specified. The declaration of SPB in this context is the control configuration for the SPB. This is an SPB management interface and it manages the configuration for IS-IS. Various parameters that define this SPB instance are configured under this SPB instance. Several of the parameters are shared with other B-VPLS service instances using SPB.

SPB enables an instance of IS-IS protocol with the no shutdown command. Alternatively, the IS-IS protocol instance under SPB is disabled with the shutdown command in the **config>service>vpls b-vpls>spb** context.

A Forwarding Identifier (FID) is optionally specified which is an abstraction of the B-VID used for forwarding in SPB. When no FID is configured the control VPLS is advertised with FID value 1.

When a FID value is specified, the control VPLS is advertised and associated with the FID value specified. The default algorithm for any FID declared or implicit is low-path-id. When a FID is specified, the ect-algorithm can be specified for the FID and changed only when there are no VPLS, SAPs or SDP bindings associated with the FID. The FID for a control instance cannot be changed once created. To change a FID the SPB component would have to be shutdown, deleted and recreated with a new FID.

Default no spb

Parameters *instance-id* — Specifies the instance ID for an SPB IS-IS instance.

Values 1024–2047 (4 available)

Default 1024

FID — Specifies FID value.

Values 1-4095

Default 1

Note: SPB operates with disable-learning, disable aging and discard-unknown. The state of these commands is ignored when SPB is configured.

spb

Syntax **[no] spb [create]**

Context config>service>vpls b-vpls>sap>spb>
config>service>vpls b-vpls>spoke-sdp>spb>

Description This command enables Shortest Path Bridging (SPB) on SAP or Spoke SDP. The B-VPLS may be a control B-VPLS or user B-VPLS. Since SPB uses IS-IS that supports multiple instances, SPB inherits the instance from the control B-VPLS.

SPB at this context level is enabled immediately. SPB enables an instance of IS-IS protocol with the no shutdown command. Alternatively, the IS-IS protocol instance under SPB is disabled with the shutdown command in the **config>service>vpls b-vpls>spb** context.

Default no spb

spbm-control-vpls

Syntax **spbm-control-vpls** *service-id* **fid** *fid*
no spbm-control-vpls

Context config>service>vpls *service-id* b-vpls>

Description This command associates a user B-VPLS with a particular control B-VPLS and a FID. The ECT algorithm and the behavior of unicast and multicast come from the association to the FID.

A Forwarding Identifier (FID) is specified which is an abstraction of the B-VID used for forwarding in SPB. The ect-algorithm is associated with the FID and can be changed only when there are no

VPLS, SAPs or SDP bindings associated with the FID. The FID must be independent from the FID assigned to other services.

Default none

shutdown

Syntax [**no**] **shutdown**

Context config>service>vpls b-vpls>spb>
config>service>vpls b-vpls>sap>spb>
config>service>vpls b-vpls>spoke-sdp>spb>

Description This command administratively disables an entity. When disabled, an entity does not change, reset, or remove any configuration settings or statistics.

The operational state of the entity is disabled as well as the operational state of any entities contained within.

The **no** form of this command administratively enables an entity.

SPB Interface — In the config>service>vpls b-vpls>spb> context, the command disables the IS-IS interface. By default, the IS-IS interface is disabled, shutdown.

lsp-lifetime

Syntax **lsp-lifetime** *seconds*
no lsp-lifetime

Context config>service>vpls b-vpls>spb

Description This command sets the time, in seconds, SPB wants the LSPs it originates to be considered valid by other routers in the domain. This is a control B-VPLS command.

Each LSP received is maintained in an LSP database until the lsp-lifetime expires unless the originating router refreshes the LSP. By default, each router refreshes its LSP's every 20 minutes (1200 seconds) so other routers will not age out the LSP.

The LSP refresh timer is derived from this formula: lsp-lifetime/2

The **no** form of the command reverts to the default value.

Default 1200 — LSPs originated by SPB should be valid for 1200 seconds (20 minutes).

Parameters *seconds* — The time, in seconds, that SPB wants the LSPs it originates to be considered valid by other routers in the domain.

Values 350 — 65535

lsp-wait

Syntax **lsp-wait** *lsp-wait* [*lsp-initial-wait* [*lsp-second-wait*]]

Context config>service>vpls b-vpls>spb

Description This command is used to customize the throttling of SPB LSP-generation. Timers that determine when to generate the first, second and subsequent LSPs can be controlled with this command. Subsequent LSPs are generated at increasing intervals of the second lsp-wait timer until a maximum value is reached. This is a control B-VPLS command.

Parameters *lsp-max-wait* — Specifies the maximum interval in seconds between two consecutive occurrences of an LSP being generated.

Values 1 — 120

Default 5

lsp-initial-wait — Specifies the initial LSP generation delay in seconds.

Values 0 — 100

Default 0

lsp-second-wait — Specifies the hold time in seconds between the first and second LSP generation.

Values 1 — 100

Default 1

overload

Syntax **overload** [**timeout** *seconds*]
no overload

Context config>service>vpls b-vpls>spb

Description This command administratively sets the SPB to operate in the overload state for a specific time period, in seconds, or indefinitely. During normal operation, the router may be forced to enter an overload state due to a lack of resources. When in the overload state, the router is only used if the destination is reachable by SPB and will not used for other transit traffic.

If a time period is specified, the overload state persists for the configured length of time. If no time is specified, the overload state operation is maintained indefinitely.

The overload command can be useful in circumstances where SPB is overloaded or used prior to executing a shutdown command to divert traffic around the switch.

The **no** form of the command causes the router to exit the overload state.

Default no overload

Parameters *seconds* — The time, in seconds, that this router must operate in overload state.

Values 60 — 1800

Default Infinity (overload state maintained indefinitely)

overload-on-boot

Syntax **overload-on-boot** [**timeout** *seconds*]
no overload-on-boot

Context config>service>vpls b-vpls>spb>

Description When the router is in an overload state, SPB the B-VPLS is used only if there is no other SPB B-VPLS to reach the destination. This command configures the IGP upon bootup in the overload state until one of the following events occur:

- The timeout timer expires.
- A manual override of the current overload state is entered with the **config**>**service**>**vpls** *instance*>**b-vpls**>**spb**>**no overload** command.

The **no** form of the command does not affect the overload-on-boot function.

If no timeout is specified, SPB IS-IS goes into overload indefinitely after a reboot. After the reboot, the SPB IS-IS status displays a permanent overload state:

```
L1 LSDB Overload : Manual on boot (Indefinitely in overload)
```

This state can be cleared with the **config**>**service**>**vpls** *instance* >**b-vpls**>**spb**>**no overload** command.

When specifying a timeout value, SPB IS-IS goes into overload for the configured timeout after a reboot. After the reboot, SPB IS-IS status displays the remaining time the system stays in overload:

```
L1 LSDB Overload : Manual on boot (Overload Time Left : 17)
```

The overload state can be cleared before the timeout expires with **config**>**service**>**vpls** *instance*>**b-vpls**>**spb**>**no overload** command.

The **no** form of the command removes the overload-on-boot functionality from the configuration.

Default no overload-on-boot

Parameters *seconds* — The time, in seconds, that this router must operate in overload state.

Values 60 — 1800

Default Infinity (overload state maintained indefinitely)

spf-wait

Syntax [**no**] **spf-wait** *spf-wait* [*spf-initial-wait* [*spf-second-wait*]]

Context config>service>vpls b-vpls>spb>

Description This command defines the maximum interval between two consecutive SPF calculations in seconds. Timers that determine when to initiate the first, second and subsequent SPF calculations after a topology change occurs can be controlled with this command.

Subsequent SPF runs (if required) occur at exponentially increasing intervals of the spf-second-wait interval. For example, if the spf-second-wait interval is 1000, then the next SPF will run after 2000 milliseconds, and then next SPF will run after 4000 milliseconds, etc., until it reaches the spf-wait value. The SPF interval remains at the spf-wait value until there are no more SPF runs scheduled in that interval. After a full interval without any SPF runs, the SPF interval drops back to spf-initial-wait.

Default no spf-wait

Parameters *spf-wait* — Specifies the maximum interval in seconds between two consecutive spf calculations.

Values 1 — 120

Default 10

spf-initial-wait — Specifies the initial SPF calculation delay in milliseconds after a topology change.

Values 10 — 100000

Default 1000

spf-second-wait — Specifies the hold time in milliseconds between the first and second SPF calculation.

Values 1 — 100000

Default 1000

level

Syntax **level** *level-number*

Context config>service>vpls b-vpls>spb

Description This command creates the context to configure SPB Level 1 or Level 2 area attributes. This is IS-IS levels. Only Level 1 can be configured.

A Level 1 adjacency can be established only with other Level 1 B-VPLS. A Level 2 adjacency can be established only with other Level 2 B-VPLS. Currently there is no support for level 1 and level 2 in the same instance of SPB.

Default level 1

Parameters *level-number* — The SPB level number.

Values 1, 2

bridge-priority

Syntax **bridge-priority** *value*

Context config>service>vpls b-vpls>spb>level level-number

Description This command configures the four bit bridge priority for Shortest Path Bridging. This value is added to the 6 byte bridge Identifier (which is the system-id) in the top four bits of a two byte field. Note the actual value will be bit shifted 12 bits left effective putting this in the high bits of the 16 bits added to system ID.

The bridge priority is important in choosing the Root Bridge for the single tree algorithm (lowest value = best). Bridge priority also factors into the tie breaker for SPF algorithms as described in the SPB standard. The bridge-identifier (system-id) of the control B-VPLS determines the tiebreaker when the bridge-priorities are equal.

Values 0 — 15

Default 8

ect-algorithm

Syntax **ect-algorithm** *name* **fid-range** *fid-range*

Context config>service>vpls b-vpls>spb>level level-number

Description This command configures the ect-algorithm associated with a FID. Names are:

- low-path-id
- high-path-id

The algorithm for low-path-id chooses the path with the lowest metric and uses the sum of each Bridge-ID to break-ties (in this case preferring the lowest bridge identifiers).

The algorithm for high-path-id choose the path with the lowest metric and the sum of each Bridge-ID (after each one is modified by the algorithm mask) to break-ties (in this case preferring the highest bridge identifiers).

A Forwarding Identifier (FID) is an abstraction of the IEEE 802.1 SPB Base VID and represents the VLAN (B-VPLS) in IS-IS LSPs. B-VPLS services with the same FID share B-MACs and I-SIDs. (the SAP encapsulation VLAN tag may be set to the same value as the FID or to any other valid VLAN tag). One or more FIDs can be associated with an ECT-algorithm by using the FID range. User B-VPLS services may share the same FID as the control B-VPLS or use independent FIDs where each FID has an assigned ect-algorithm. B-VPLS services with i-vpls services must have an independent FID. B-VPLS services with only PBB Epipes may share FIDs with other B-VPLS services including the control B-VPLS service.

The ect-algorithm is associated with the FID and can only be changed only when there are no VPLS, SAPs or SDP bindings associated with the FID. The FID must be independent from the FID assigned to other services.

Default low-path-id

Parameters *name* — low-path-id, high-path-id

fid-range — Range of Forwarding Identifier values.

Values 1 — 4095

forwarding-tree-topology

Syntax **forwarding-tree-topology unicast** [**st**|**spf**]

Context config>service>vpls b-vpls>spb>level level-number

Description This command sets the unicast forwarding to follow the shortest path tree defined by the ECT algorithm shortest path forwarding (spf) or to follow a single tree. (st). Shortest path trees make use of more link resources.

Multicast traffic is defaulted to follow the single tree topology. A single tree unicast would make Multicast and uncast follow the same path.

Default spf

lsp-pacing-interval

Syntax **lsp-pacing-interval** *milliseconds*
no lsp-pacing-interval

Context config>service>vpls b-vpls>sap>spb>
config>service>vpls b-vpls>spoke-sdp>spb>

Description This command configures the interval between SPB LSP PDUs sent from this interface. This command is valid only for interfaces on control B-VPLS.

To avoid bombarding adjacent neighbors with excessive data, pace the Link State Protocol Data Units (LSP's). If a value of zero is configured, no LSP's are sent from the interface.

The no form of the command reverts to the default value.

Default 100 — LSPs are sent in 100 millisecond intervals.

Parameters *milliseconds* — The interval in milliseconds that SPB IS-IS LSP's can be sent from the interface expressed as a decimal integer.

0 — 65535

retransmit-interval

Syntax **retransmit-interval** *seconds*
no retransmit-interval

Context config>service>vpls b-vpls>sap>spb>
config>service>vpls b-vpls>spoke-sdp>spb>

Description This command configures the minimum time between LSP PDU retransmissions on a point-to-point interface. This command is valid only for interfaces on control B-VPLS.

The no form of the command reverts to the default value.

Default 100

Parameters *seconds* — The interval in seconds that SPB IS-IS LSPs can be sent on the interface.

Values 1 — 65535

metric

Syntax **metric** *value*
No metric

Context config>service>vpls b-vpls>sap>spb>level
config>service>vpls b-vpls>spoke-sdp>spb>level

Description This configures metric for this SPB interface SAP/spoke-sdp. This command is valid only for interfaces on control B-VPLS.

Values 1 — 16,777,215

Default 1000

hello-interval

Syntax **hello-interval** *seconds*
no hello-interval

Context config>service>vpls b-vpls>sap>spb>level
config>service>vpls b-vpls>spoke-sdp>spb>level

Description This command configures the interval in seconds between hello messages issued on this interface at this level. This command is valid only for interfaces on control B-VPLS.

The no form of the command to reverts to the default value.

Default 3 — Hello interval default for the designated intersystem.

9 — Hello interval default for non-designated intersystems.

Parameters *seconds* — The hello interval in seconds expressed as a decimal integer.

Values 1 — 20000

hello-multiplier

Syntax **hello-multiplier** *multiplier*
no hello-multiplier

Context config>service>vpls b-vpls>sap>spb>level
config>service>vpls b-vpls>spoke-sdp>spb>level

Description This command configures the number of missing hello PDUs from a neighbor SPB declares the adjacency down. This command is valid only for interfaces on control B-VPLS.

The no form of the command reverts to the default value.

Default 3 — SPB can miss up to 3 hello messages before declaring the adjacency down.

Parameters *multiplier* — The multiplier for the hello interval expressed as a decimal integer.

Values 2 — 100

mrp

Syntax **mrp**

Context config>service>vpls
config>service>vpls>mesh-sdp
config>service>vpls>sap
config>service>vpls>spoke-sdp

Description This command configures Multiple Registration Protocol (MRP) parameters. MRP is valid only under B-VPLS.

attribute-table-size

Syntax [**no**] **attribute-table-size** *value*

Context config>service>vpls>mrp

Description This command controls the number of attributes accepted on a per B-VPLS basis. When the limit is reached, no new attributes will be registered.

If a new lower limit (smaller than the current number of attributes) from a local or dynamic I-VPLS is being provisioned, a CLI warning will be issued stating that the system is currently beyond the new limit. The value will be accepted, but any creation of new attributes will be blocked under the attribute count drops below the new limit; the software will then start enforcing the new limit.

Default maximum number of attributes

Parameters *value* — [1-2048] for 7450 ESS-6, 7450 ESS-7, 7450 ESS-12, 7750 SR-7, or 7750 SR-12

[1-1023] for 7450 ESS-1 or 7750 SR-1

attribute-table-high-wmark

Syntax [**no**] **attribute-table-high-wmark** *high-water-mark*

Context config>service>vpls>mrp

Description This command specifies the percentage filling level of the MMRP attribute table where logs and traps are sent.

Default 95%

Parameters *high-water-mark* — 1%-100%

attribute-table-low-wmark

Syntax [**no**] **attribute-table-low-wmark** *low-water-mark*

Context config>service>vpls>mrp

Description This command specifies the MMRP attribute table low matermark as a percentage. When the percentage filling level of the MMRP attribute table drops below the configured value, the corresponding trap is cleared and/or a log entry is added.

Default 90%

Parameters *low-water-mark* — 1%-100%

flood-time

Syntax **flood-time** *flood-time*
no flood-time

Context config>service>vpls>mrp

Description This command configures the amount of time, in seconds, after a status change in the VPLS service during which traffic is flooded. Once that time expires, traffic will be delivered according to the MMRP registrations that exist in the VPLS. When "no flood-time" is executed, flooding behavior is disabled.

Default no flood-time

Parameters *flood-time* — Specifies the MRP flood time, in seconds.

Values 3 — 600

join-time

Syntax [**no**] **join-time** *value*

Context config>service>vpls>sap>mrp
config>service>vpls>spoke-sdp>mrp
config>service>vpls>mesh-sdp>mrp

Description This command controls the interval between trasmit opportunities that are applied to the Applicant state machine. An instance of this Join Period Timer is required on a per-Port, per-MRP Participant basis. For additional information, refer to IEEE 802.1ak-2007 section 10.7.4.1.

Default 2

Parameters *value* — [1-10] tenths of a second

leave-time

Syntax [**no**] **leave-time** *value*

Context config>service>vpls>sap>mrp
config>service>vpls>spoke-sdp>mrp
config>service>vpls>mesh-sdp>mrp

Description This command controls the period of time that the Registrar state machine will wait in the leave state before transitioning to the MT state when it is removed. An instance of the timer is required for each state machine that is in the leave state. The Leave Period Timer is set to the value leave-time when it is started.

A registration is normally in "in" state where there is an MFIB entry and traffic is being forwarded. When a "leave all" is performed (periodically around every 10-15 seconds per SAP/SDP binding - see leave-all-time-below), a node sends a message to its peer indicating a leave all is occurring and puts all of its registrations in leave state.

The peer refreshes its registrations based on the leave all PDU it receives and sends a PDU back to the originating node with the state of all its declarations.

Refer to IEEE 802.1ak-2007 section 10.7.4.2.

Default 30

Parameters *value* — [30-60] tenths of a second

leave-all-time

Syntax [**no**] **leave-all-time** *value*

Context config>service>vpls>sap>mrp
config>service>vpls>spoke-sdp>mrp
config>service>vpls>mesh-sdp>mrp

Description This command controls the frequency with which the LeaveAll state machine generates LeaveAll PDUs. The timer is required on a per-Port, per-MRP Participant basis. The Leave All Period Timer is set to a random value, T, in the range LeaveAllTime<T<1.5*leave-all-time when it is started. Refer to IEEE 802.1ak-2007 section 10.7.4.3.

Default 100

Parameters *value* — [60-300] tenths of a second

periodic-time

Syntax [**no**] **periodic-time** *value*

Context config>service>vpls>sap>mrp
config>service>vpls>spoke-sdp>mrp
config>service>vpls>mesh-sdp>mrp

Description This command controls the frequency the PeriodicTramsmission state machine generates periodic events if the Periodic Transmission Timer is enabled. The timer is required on a per-Port basis. The Periodic Transmissing Timer is set to one second when it is started.

Default 10

Parameters *value* — [10-100] tenths of a second

periodic-timer

Syntax [**no**] **periodic-timer**

Context config>service>vpls>sap>mrp
config>service>vpls>spoke-sdp>mrp
config>service>vpls>mesh-sdp>mrp

Description This command enables or disables the Periodic Transmission Timer.

Default disabled

send-flush-on-failure

Syntax [**no**] **send-flush-on-failure**

Context config>service>vpls

Description This command enables sending out "flush-all-from-ME" messages to all LDP peers included in affected VPLS, in the event of physical port failures or "oper-down" events of individual SAPs. This feature provides an LDP-based mechanism for recovering a physical link failure in a dual-homed connection to a VPLS service. This method provides an alternative to RSTP solutions where dual homing redundancy and recovery, in the case of link failure, is resolved by RSTP running between a PE router and CE devices. If the endpoint is configured within the VPLS and send-flush-on-failure is enabled, flush-all-from-me messages will be sent out only when all spoke SDPs associated with the endpoint go down.

This feature cannot be enabled on management VPLS.

Default no send-flush-on-failure

pbb

Syntax **pbb**

Context config>service
config>service>vpl
config>service>epipe

Description This command configures global PBB parameters.

mac-name

Syntax **mac-name** *name ieee-address*

no mac-name *name*

Context config>service>pbb

Description This command configures the MAC name for the MAC address. It associates an ASCII name with an IEEE MAC to improve the PBB Epipe configuration. It can also change the dest-BMAC in one place instead of 1000s of Epipe.

Parameters *name* — Specifies the MAC name up to 32 characters in length.

ieee-address — The MAC address assigned to the MAC name. The value should be input in either a xx:xx:xx:xx:xx:xx or xx-xx-xx-xx-xx-xx format.

source-bmac

Syntax **source-bmac** *ieee-address*
no source-bmac

Context config>service>pbb

Description This command configures the source B-VPLS MAC address to use with PBB and provisions a chassis level source BMAC.

Parameters *ieee-address* — The MAC address assigned to the BMAC. The value should be input in either a xx:xx:xx:xx:xx:xx or xx-xx-xx-xx-xx-xx format.

backbone-smac

Syntax **backbone-smac** *ieee-address*

Context config>service>pbb>source-bmac

Description This command configures the backbone source MAC address used for PBB. This command allows a per B-VPLS control of the B-SMAC and the B-Mcast MAC. All I-VPLS provisioned under this B-VPLS will share the provisioned value.

Default backbone-smac address is chassis MAC address

Parameters *ieee-address* — Specifies the backbone source MAC address.

backbone-vpls

Syntax **backbone-vpls** *vpls-id*[:*isid*]
no backbone-vpls

Context config>service>vpls>pbb

Description This command associated the I-VPLS with the B-VPLS service. The ISID value is used to mux/demux packets for the VPLS flowing through the B-VPLS.

Parameters *vpls-id* — This value represents the VPLS ID value associated with the B-VPLS.

isid — Defines ISID associated with the I-VPLS.

Default The default is the service-id.

Values 0 — 16777215

force-qtag-forwarding

Syntax [**no**] **force-qtag-forwarding**

Context config>service>vpls ivpls>pbb

Description This command forces the addition of a IEEE 802.1q tag after the Customer MAC (CMAC) address when the PBB header is built as it egresses a related BVPLS. It is used to preserve the dot1q and DE bits from the customer domain when the service delimiting qtags are stripped as the packet is ingressing a PBB Epipe or an IVPLS. The VLAN value of the service delimiting QTAG, if one exists, is used for the corresponding inserted dot1q field. If a service delimiting QTAG does not exist, then the value of zero is used for all the inserted QTAG bits. The no form of this command sets default behavior.

The **no** form of this command disables the command.

source-bmac

Syntax **source-bmac** *ieee-address*

Context config>service>vpls bvpls>pbb

Description This command configures the base source BMAC for the B-VPLS. The first 32 bits must be the same with what is configured in the MC-LAG peer. If not configured here, it will inherit the chassis level BMAC configured under the new PBB object added in the previous section. If the **use-sap-bmac** command is on, the value of the last 16 bits (lsb) of the source BMAC must be part of the **reserved-source-bmac-lsb** configured at chassis level, under service PBB component. If that is not the case, the command will fail.

use-sap-bmac

Syntax [**no**] **use-sap-bmac**

Context config>service>vpls bvpls>pbb

Description This command enables on a per BVPLS basis the use of source BMACs allocated to multi-homed SAPs (assigned to an MC-LAG) in the related IVPLS or Epipe service. The command will fail if the value of the source-bmac assigned to the BVPLS is the hardware (chassis) BMAC. In other words, the **source-bmac** must be a configured one.

Default no use-sap-bmac

mac-notification

Syntax **mac-notification**

Context config>service>vpls bvpls

Description This command controls the settings for the MAC notification message.

The mac-notification message must be generated under the following events:

1. When enabled in the BVPLS using no shutdown, a MAC notification will be sent for every active MC-LAG link. The following 3 cases assume no shutdown in the BVPLS.
2. Whenever a related MC-LAG link becomes active (related MC-LAG link = has at least 1 SAP associated with the BVPLS) if the MC-LAG peering is initialized and the PE peers are synchronized.
3. 1st SAP on an active MC-LAG is associated (via IVPLS/Epipe) with the BVPLS
4. The link between IVPLS/Epipe and BVPLS is configured and there are I-SAPs configured on an active MC-LAG link.

The MAC notification is not sent for the following events:

1. Change of source-bmac or source-bmac-lsb
2. On changes of use-sap-bmac parameter
3. If MC-LAG peering is not (initialized and in sync).

interval

Syntax [**no**] **interval** *value*

Context config>service>vpls>pbb>mac-notification

Description This command controls the frequency of subsequent MAC notification messages.

Default Inherits the chassis level configuration from config>service>mac-notification

Parameters *value* — Specifies the frequency of subsequent MAC notification messages.

Values 100 ms – 10 sec, in increments of 100 ms up to 1 sec and then in increments of 1 second up to 10 sec.

renotify

Syntax **renotify** *value*
no renotify

Context config>service>vpls>pbb>mac-notification

Description This command controls the periodic interval at which sets of MAC notification messages are sent. At each expiration of the renotify timer, a new burst of notification messages is sent, specifically <count> frames at <interval> deci-seconds.

Default no renotify

Parameters *value* — Specifies the time interval between re-notification in seconds.

Values 240—840 seconds

count

Syntax [**no**] **count** *value*

Context config>service>vpls>pbb>mac-notification

Description This command configures how often MAC notification messages are sent.

Parameters *value* — Specifies, in seconds, how often MAC notification messages are sent.

Values 1—10

Default Inherits the chassis level configuration from config>service>mac-notification

shutdown

Syntax [**no**] **shutdown**

Context config>service>vpls bvpls

Description This command disables the sending of the notification message in the BVPLS domain.

Default shutdown

backbone-vpls

Syntax **backbone-vpls** *service-id* [**isid** *isid*]
no backbone-vpls

Context config>service>vpls>pbb

Description This command configures B-VPLS service associated with the I-VPLS.

Parameters *service-id* — Specifies the service ID.

Values 1..2147483648

isid — Specifies the ISID.

Values 0..16777215

igmp-snooping

Syntax **igmp-snooping**

Context config>service>vpls>pbb>bvpls
config>service>vpls>pbb>bvpls>sap
config>service>vpls>pbb>bvpls>sdp

Description This command configures IGMP snooping attributes for I-VPLS.

mld-snooping

Syntax **mld-snooping**

Context config>service>vpls>pbb>bvpls
config>service>vpls>pbb>bvpls>sap
config>service>vpls>pbb>bvpls>sdp

Description This command configures MLD snooping attributes for I-VPLS.

mrouter-dest

Syntax [**no**] **mrouter-dest** *mac-name*

Context onfig>service>vpls>pbb>bvpls>igmp-snooping
onfig>service>vpls>pbb>bvpls>mld-snooping

Description This command configures the destination BMAC address name to be used in the related backbone VPLS to reach a specific IGMP or MLD snooping MRouter. The name is associated at system level with the MAC address, using the command **mac-name** on page 994.

Parameters *mac-name* — Specifies the MAC name.

Values 32 chars max

sap

Syntax [**no**] **sap** *sap-id*

Context config>service>vpls
config>service>vpls>pbb>backbone-vpls

Description This command configures attributes of a SAP on the B-VPLS service.

mrouter-port

Syntax [**no**] **mrouter-port**

Context config>service>vpls>pbb>bvpls>sap>igmp-snooping
config>service>vpls>pbb>bvpls>sdp>igmp-snooping
config>service>vpls>pbb>bvpls>sap>mld-snooping

config>service>vpls>pbb>bvpls>sdp>mld-snooping

Description This command specifies whether a multicast router is attached behind this SAP or spoke-SDP.

Configuring a SAP or spoke-SDP as an mrouter-port will have a double effect. Firstly, all multicast traffic received on another SAP or spoke-SDP will be copied to this SAP or spoke-SDP. Secondly, IGMP or MLD reports generated by the system as a result of someone joining or leaving a multicast group, will be sent to this SAP or SDP.

If two multicast routers exist in the local area network, one of them will become the active querier. The other multicast router (non-querier) stops sending IGMP or MLD queries, but it should still receive reports to keep its multicast trees up to date. To support this, the mrouter-port should be enabled on all SAPs or spoke-SDPs connecting to a multicast router.

Note that the IGMP version to be used for the reports (v1, v2 or v3) or MLD version (v1 or v2) can only be determined after an initial query has been received. Until such time no reports are sent on the SAP, even if mrouter-port is enabled.

If the **send-queries** command is enabled on this SAP or spoke-SDP, the **mrouter-port** parameter can not be set.

Default no mrouter-port

sdp

Syntax [**no**] **sdp** *sdp-id:vc-id*

Context config>service>vpls>pbb>backbone-vpls

Description This command configures attributes of a SDP binding on the B-VPLS service.

Parameters *sdp-id* — Specifies the SDP ID.

Values 1..17407

vc-id — Specifies the VC ID.

Values 1..4294967295

stp

Syntax [**no**] **stp**

Context config>service>Vpls>pbb>backbone-vpls

Description This command enables or disable STP through B-VPLS service.

force-qtag-forwarding

Syntax [**no**] **force-qtag-forwarding**

Context config>service>vpls ivpls>pbb

config>service>epipe>pbb

Description This command forces the addition of a IEEE 802.1q tag after the Customer MAC (CMAC) addresses when the PBB header is built, as it egresses a related BVPLS.

It is used to preserve the dot1q and DE bits from the customer domain when the service delimiting qtags are stripped when the packet is ingressing a PBB Epipe or an IVPLS. The VLAN value of the service delimiting QTAG if one exists is used for the corresponding inserted dot1q field. If a service delimiting QTAG does not exist, then the value of zero is used for all the inserted QTAG bits.

The **no** form of this command sets default behavior.

Default disabled

mrp-policy

Syntax [**no**] **mrp-policy**

Context config>service>vpls>sap>mrp
config>service>vpls>spoke-sdp>mrp
config>service>vpls>mesh-sdp>mrp

Description This command instructs MMRP to use the mrp-policy defined in the command to control which group BMAC attributes will be declares and registered on the egress SAP/Mesh-SDP/Spoke-SDP. The Group BMACs will be derived from the ISIDs using the procedure used in the PBB solution. The Group MAC = standard OUI with the last 24 bits being the ISID value. If the policy-name refers to a non-existing mrp-policy the command should return error. Changes to a mrp-policy are allowed and applied to the SAP/SDPs under which the policy is referenced.

Default no mrp-policy

send-bvpls-flush

Syntax [**no**] **send-bvpls-flush** {[**all-from-me**] | [**all-but-mine**]}

Context config>service>vpls

Description This command configures the BVPLS flush. If B-SDPs are used and MAC notification mechanism is turned on in the related BVPLS (MPLS use case), it makes sense to turn off the T-LDP MAC Flush.

mac-notification

Syntax **mac-notification**

Context config>service>pbb

Description This command controls the settings for the MAC notification messages.

interval

Syntax [**no**] **interval** *value*

Context config>service>pbb>mac-notification

Description This command controls the frequency of subsequent MAC notification messages.

Default 100 ms

Parameters *value* — Specifies the frequency of subsequent MAC notification messages.

Values 100 ms – 10 sec, in increments of 100 ms up to 1 sec and then in increments of 1 second up to 10 sec.

count

Syntax [**no**] **count** *value*

Context config>service>pbb>mac-notification

Description This command configures how often MAC notification messages are sent.

Parameters *value* — Specifies, in seconds, how often MAC notification messages are sent.

Values 1-10

Default 3

epipe

Syntax **epipe** *service-id* **customer** *customer-id* [**vpn** *vpn-id*] [**vc-switching**] [**create**]
epipe *service-id*
no epipe *service-id*

Context config>service

Description This command configures an Epipe service instance. This command is used to configure a point-to-point epipe service. An Epipe connects two endpoints defined as Service Access Points (SAPs). Both SAPs may be defined in one .

No MAC learning or filtering is provided on an Epipe.

When a service is created, the **customer** keyword and *customer-id* must be specified and associates the service with a customer. The *customer-id* must already exist having been created using the **customer** command in the service context. Once a service has been created with a customer association, it is not possible to edit the customer association. The service must be deleted and recreated with a new customer association.

Once a service is created, the use of the **customer** *customer-id* is optional for navigating into the service configuration context. Attempting to edit a service with the incorrect *customer-id* specified will result in an error.

By default, no epipe services exist until they are explicitly created with this command.

The **no** form of this command deletes the epipe service instance with the specified *service-id*. The service cannot be deleted until the service has been shutdown.

service-id — The unique service identification number identifying the service in the service domain. This ID must be unique to this service and may not be used for any other service of any type. The *service-id* must be the same number used for every on which this service is defined.

Values 1 — 2147483648

customer *customer-id* **—** Specifies the customer ID number to be associated with the service. This parameter is required on service creation and optional for service editing or deleting.

Values 1 — 2147483647

create — Keyword used to create the service instance. The **create** keyword requirement can be enabled/disabled in the **environment>create** context.