EVPN Commands

vpls

Syntax **vpls** *service-id* **customer** *customer-id* **vpn** *vpn-id* [**m-vpls**] [**bvpls | i-vpls**] [**create**]
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.

Parameters *service-id* — The unique service identification number or string 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 router on which this service is defined.

Values

service-id:	1 — 2147483648
svc-name:	64 characters maximum

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.

bgp

Syntax **bgp**

Context config>service>vpls

Description This command enables the context to configure the BGP related parameters for BGP AD, BGP VPLS and EVPN.

route-target

Syntax **route-target** {*ext-community* | {[**export** *ext-community*] [**import** *ext-community*]}}
no route-target

Context config>service>vpls>bgp-ad
config>service>vpls>bgp

Description This command configures the route target (RT) component that will be signaled in the related MP-BGP attribute to be used for BGP auto-discovery, BGP VPLS, BGP Multi-Homing and EVPN if these features are configured in this VPLS service.

If this command is not used, the RT is built automatically using the VPLS ID. The ext-comm can have the same two formats as the VPLS ID, a two-octet AS-specific extended community, IPv4 specific extended community.

Parameters **export** *ext-community* — Specify communities allowed to be sent to remote PE neighbors.

import *ext-community* — Specify communities allowed to be accepted from remote PE neighbors.

vsi-export

Syntax **vsi-export** *policy-name* [*policy-name*...(up to 5 max)]
no vsi-export

Context config>service>vpls>bgp-ad
config>service>vpls>bgp

Description This command specifies the name of the VSI export policies to be used for BGP auto-discovery, BGP VPLS and BGP Multi-Homing if these features are configured in this VPLS service. If multiple policy names are configured, the policies are evaluated in the order they are specified. The first policy that matches is applied.

The policy name list is handled by the SNMP agent as a single entity.

vsi-import

Syntax **vsi-import** *policy-name* [*policy-name*...(up to 5 max)]
no vsi-import

Context config>service>vpls>bgp-ad>vsi-id
config>service>vpls>bgp

Description This command specifies the name of the VSI import policies to be used for BGP auto-discovery, BGP VPLS and BGP Multi-Homing if these features are configured in this VPLS service. If multiple policy names are configured, the policies are evaluated in the order they are specified. The first policy that matches is applied.

The policy name list is handled by the SNMP agent as a single entity.

route-distinguisher

Syntax **route-distinguisher** [*ip-addr:comm-val* | *as-number:ext-comm-va*l]
route-distinguisher auto-rd
no route-distinguisher

Context config>service>vpls>bgp

Description This command configures the Route Distinguisher (RD) component that will be signaled in the MP-BGP NLRI for L2VPN and EVPN families. This value will be used for BGP-AD, BGP VPLS and BGP Multi-Homing NLRI if these features are configured.

If this command is not configured, the RD is automatically built using the BGP-AD VPLS ID. The following rules apply:

- if BGP AD VPLS-id is configured & no RD is configured under BGP node - RD = VPLS-ID
- if BGP AD VPLS-id is not configured then an RD value must be configured under BGP node (this is the case when only BGP VPLS is configured)
- if BGP AD VPLS-id is configured and an RD value is also configured under BGP node, the configured RD value prevails

Values and format (6 bytes, other 2 bytes of type will be automatically generated)

Alternatively, the **auto-rd** option allows the system to automatically generate an RD based on the **bgp-auto-rd-range** command configured at service level.

Parameters *ip-addr:comm-val* — Specifies the IP address.

Values

ip-addr	a.b.c.d
comm-val	0 — 65535

as-number:ext-comm-val — Specifies the AS number.

Values

as-number	1 — 65535
ext-comm-val	0 — 4294967295

auto-rd — the system will generate an RD for the service according to the IP address and range configured in the **bgp-auto-rd-range** command.

vsi-import

Syntax **vsi-import** *policy-name* [*policy-name*...(up to 5 max)]
no vsi-import

Context config>service>vpls>bgp-ad>vsi-id
config>service>vpls>bgp

Description This command specifies the name of the VSI import policies to be used for BGP auto-discovery, BGP VPLS and BGP Multi-Homing if these features are configured in this VPLS service. If multiple policy names are configured, the policies are evaluated in the order they are specified. The first policy that matches is applied.

The policy name list is handled by the SNMP agent as a single entity.

bgp-auto-rd-range

Syntax **bgp-auto-rd-range** *ip-address* **comm-val** *comm-val* **to** *comm-val*
no bgp-auto-rd-range

Context config>service>system

Description This command defines the type-1 route-distinguisher ipv4 address and community value range within which the system will select a route-distinguisher for the **bgp-enabled** services using **auto-rd**.

Interactions:

This command is used along with the **route-distinguisher auto-rd** command supported in VPLS, VPRN and Epipe services. The system forces the user to create a **bgp-auto-range** before the **auto-rd** option can be used in the services.

Note that the system will keep allocating values for services configured with **route-distinguisher auto-rd** as long as there are available community values within the configured range. Once the command is added, the following changes are allowed:

- The ip-address can be changed without modifying the *comm-va***l** range, even if services using **auto-rd** are present. The affected routes will be withdrawn and re-advertised with the new route-distinguishers.
- The *comm-val* range can be modified as long as no conflicting values are present in the new range. For example, the user may expand the range as long as the new range does not overlap with existing manual route-distinguishers. The user may also reduce the range as long as the new range can accommodate the already allocated auto-RDs.

Parameters *ip-address* — Specifies the IPv4 address used in the first 4 octets of all the type-1 auto route-distinguishers selected by the system.

comm-val — Specifies the community value of the type-1 auto route-distinguisher.

Values 0 — 65535

bgp-evpn

Syntax [**no**] **bgp-evpn**

Context config>service>vpls

config>service>system

Description This command enables the context to configure the BGP EVPN parameters in the base instance.

route-distinguisher

Syntax **route-distinguisher** [*ip-addr:comm-val* | *as-number:ext-comm-va*l]
no route-distinguisher

Context config>service>system>bgp-evpn

Description This command configures the Route Distinguisher (RD) component that will be signaled in the MP-BGP NLRI for for EVPN corresponding to the base EVPN instance (Ethernet Segment routes). If the route-distinguisher component is not configured, the system will use system:ip-address as the default route-distinguisher

Default **no route-distinguisher**

Parameters *ip-addr:comm-val* — Specifies the IP address.

Values

ip-addr	a.b.c.d
comm-val	0 — 65535

as-number:ext-comm-val — Specifies the AS number.

Values

as-number	1 — 65535
ext-comm-val	0 — 4294967295

ethernet-segment

Syntax **ethernet-segment** *name* **create**
no ethernet-segment

Context config>service>system>bgp-evpn

Description This command configures an ethernet-segment instance its corresponding name.

Parameters *name* — Specifies the 28-character ethernet-segment name.

es-activation-timer

Syntax **es-activation-timer** *seconds*
no es-activation-timer

Context config>service>system>bgp-evpn>ethernet-segment

Description This command configures the ethernet-segment activation timer for a given ethernet-segment. The **es-activation-timer** delays the activation of a given ethernet-segment on a given PE that has been elected as DF (Designated Forwarder). Only when the **es-activation-timer** has expired, the SAP/SDP-binding associated to an ethernet-segment can be activated (in case of single-active multi-homing) or added to the default-multicast-list (in case of all-active multi-homing).

If **no es-activation-timer** is configured, the system will use the value configured at **config>redundancy>bgp-evpn-multi-homing>es-activation-timer** if configured. Otherwise the system will use a default value of 3 seconds.

Default **no es-activation-timer**

Parameters *seconds* — Specifies the number of seconds for the **es-activation-timer**.

Values 0 — 100 seconds

esi

Syntax **esi** *value*
no esi

Context config>service>system>bgp-evpn>ethernet-segment

Description This command configures the 10-byte ethernet-segment identifier associated to the ethernet-segment that will be signaled in the BGP-EVPN routes. The esi value cannot be changed unless the ethernet-segment is shutdown. Reserved esi values (0 and MAX-ESI) are not allowed.

Parameters *value* — Specifies the 10-byte esi.

Values 00-11-22-33-44-55-66-77-88-99 with any of these separators ('-',':')

lag

Syntax **lag** *lag-id*
no lag

Context config>service>system>bgp-evpn>ethernet-segment

Description This command configures a lag-id associated to the ethernet-segment. When the ethernet-segment is configured as **all-active.** only a lag can be associated to the ethernet-segment. When the ethernet-segment is configured as **single-active**, then a lag, port or sdp can be associated to the ethernet-segment. In either case, only one of the three objects can be configured in the ethernet-segment. A given lag can be part of only one ethernet-segment.

Default **no lag**

Parameters *lag-id* — Specifies the lag-id associated with the ethernet-segment.

Values 1 — 800

multi-homing

Syntax **multi-homing single-active** [no-esi-label]
multi-homing all-active
no multi-homing

Context config>service>system>bgp-evpn>ethernet-segment

Description This command configures the multi-homing mode for the ethernet-segment as s**ingle-active** or all-active multi-homing, as defined in RFC7432.

By default, the use of **esi-labe**l is enabled for **all-active** and **single-active** as definded in RFC7432 (for **single-active multi-homing,** the esi-label is used to avoid transient loops).

When **single-active no-esi-label** is specified, the system will not allocate a label for the esi and hence advertise esi label 0 to peers. Even if the esi is configured to not send the esi-label, upon reception of an esi-label from a peer, the PE will always send traffic to that peer using the received esi-label.

Default **no multi-homing.**

Parameters *single-active* — configures single-active mode for the ethernet-segment

all-active — configures the system to not send an esi-label for **single-active** mode

no-esi-label — configures single-active mode for the ethernet-segment

port

Syntax **port** *port-id*
no port

Context config>service>system>bgp-evpn>ethernet-segment

Description This command configures a port-id associated with the ethernet-segment. If the ethernet-segment is configured as **all-active** only a lag can be associated to the ethernet-segment. If the ethernet-segment is configured as **single-active**, then a lag, port or sdp can be associated to the ethernet-segment. In any case, only one of the three objects can be configured in the ethernet-segment. A given port can be part of only one ethernet-segment. Only ethernet ports can be added to an ethernet-segment.

Default **no port**

Parameters *port-id* — Specifies the slot/mda/port associated to the ethernet-segment.

sdp

Syntax **sdp** *sdp-id*
no sdp

Context config>service>system>bgp-evpn>ethernet-segment

Description This command configures an sdp-id associated to the ethernet-segment. If the ethernet-segment is configured as **all-active** only a lag can be associated to the ethernet-segment. If the ethernet-segment

is configured as **single-active**, then a lag, port or sdp can be associated to the ethernet-segment. In any case, only one of the three objects can be configured in the ethernet-segment. A given sdp can be part of only one ethernet-segment. Only user-configured sdps can be added to an ethernet-segment.

Default **no sdp**

Parameters *sdp-id* — Specifies the IP address.

Values 1 — 17407

service-carving

Syntax **service-carving**

Context config>service>system>bgp-evpn>ethernet-segment

Description The service-carving algorithm determines the PE that is the Designated Forwarder (DF) in a given ethernet-segment and for a given service. This command enables the context to configure service-carving in the ethernet-segment.

mode

Syntax **mode {manual | auto | off}**

Context config>service>system>bgp-evpn>ethernet-segment>service-carving

Description This command configures the service-carving mode. This determines how the DF is elected for a given ethernet-segment and service.

Default **mode auto**

Parameters **auto —** This mode is the service-carving algorithm defined in RFC7432. The DF for the service is calculated based on the modulo function of the service (identified by either the evi or the isid) and the number of PEs.

manual — In this mode the DF is elected based on the manual configuration added in the **service-carving>manual** context.

off — In this mode all the services elect the same DF PE (assuming the same PEs are active for all the configured services). The PE with the lowest IP is elected as DF for the ethernet-segment.

manual

Syntax **manual**

Context config>service>system>bgp-evpn>ethernet-segment>service-carving

Description This command enables the context to configure service-carving in a manual way, that is, configuring the evis or isids for which the PE is DF

evi

Syntax **evi** *start* [**to** *to*] **primary**
no evi

Context config>service>system>bgp-evpn>ethernet-segment>service-carving>manual

Description This command configures the evi ranges for which the PE is DF.

Note that multiple individual evi values and multiple evi ranges are allowed. The PE will be non-DF for the evi values not defined as **primary**.

Parameters *start* — This specifies the initial evi value of the range for which the PE is DF.

Values 1 — 65535

to — This specifies the end evi value of the range for which the PE is DF. If not configured, only the individual start value will be considered.

Values 1 — 65535

primary — Specifies that the PE is DF for the configured evi range.

isid

Syntax **isid** *start* [**to** *to*] **primary**
no sid

Context config>service>system>bgp-evpn>ethernet-segment>service-carving>manual

Description This command configures the **isid** ranges for which the PE is DF. Note that multiple individual **isid** values and multiple isid ranges are allowed. The PE will be non-DF for **isid** values not defined as **primary**.

Parameters *start* — This specifies the initial **isid** value of the range for which the PE is DF.

Values 1 — 16777215

to — This specifies the end **isid** value of the range for which the PE is DF. If not configured, only the individual start value will be considered.

Values 1 — 16777215

primary — Specifies that the PE is DF for the configured **evi** range.

shutdown

Syntax **shutdown**
no shutdown

Context config>service>system>bgp-evpn>ethernet-segment

Description This command changes the administrative status of the ethernet-segment.

The user can do **no shutdown** only when esi, multi-homing and lag/port/sdp are configured. If the ethernet-segment or the corresponding lag/port/sdp shutdown, the ethernet-segment route and the AD per-ES routes will be withdrawn. No changes are allowed when the ethernet-segment is **no shutdown**

Default **shutdown**

source-bmac-lsb

Syntax **source-bmac-lsb** *MAC Lsb* [**es-bmac-table-size** *size*]
no source-bmac-lsb

Context config>service>system>bgp-evpn>ethernet-segment

Description This command configures the least significant two bytes of the BMAC used as source BMAC for packets generated from the ethernet-segment in PBB-EVPN.

When the multi-homing mode is **all-active**, this value and the first high order four bytes must match on all the PEs that are part of the same ethernet-segment .

The **es-bmac-table-size** parameter modifies the default value (8) for the maximum number of virtual bmacs that can be associated to the ethernet-segment, that is, the es-bmacs. When the **source-bmac-lsb** is configured, the associated **es-bmac-table-size** is reserved out of the total FDB. Note that the es-bmac will consume a separate BMAC per B-VPLS that is linked to an ethernet-segment

Parameters *MACLsb* — This specifies the two least significant bytes of the es-bmac.

Values 1 — 65535 or xx-xx or xx:xx

size — This specifies the reserved space in the FDB for a given es-bmac. By default the system reserves 8 entries for a given ethernet-segment BMAC.

Values 1 — 511999

Default 8

redundancy

Syntax **redundancy**

Context config

Description This command enables the context to configure the global redundancy parameters.

bgp-evpn-multi-homing

Syntax **bpg-evpn-multi-homing**

Context config>redundancy

config>redundancy

Description This command enables the context to configure the bgp-evpn global timers

boot-timer

Syntax **boot-timer** *seconds*

Context config>redundancy>bgp-evpn-multi-homing

Description When the PE boots up, the **boot-timer** will allow the necessary time for the control plane protocols to come up before bringing up the ethernet-segments and running the DF algorithm.

The following considerations apply to the functionality:

- The boot-timer is configured at the system level **config>redundancy>bgp-evpn-multi-homing# boot-timer**. The configured value must provide enough time to allow the IOMs and BGP sessions to come up before exchanging ES routes and running the DF election for each EVI/ISID.
- The boot-timer is synchronized across CPMs and is relative to the System UP-time; hence it is not subject to change or reset upon CPM switchover.
- The boot-timer is never interrupted (the e**s-activation-timer**, however, can be interrupted if there is a new event triggering the DF election).
- The boot-timer runs per EVI/ISID on the ES's in the system. While **system-up-time** < **boot-timer** is true, the system does not run the DF election for any EVI/ISID. Once the boot-timer expires, the DF election for the EVI/ISID is run and if the system is elected DF for the EVI/ISID, the **es-activation-timer** will kick-in.
- The system will **not** advertise ES routes until the boot timer has expired. This guarantees that the peer ES PEs do not run the DF election until the PE is ready to become the DF, if required.

Default **boot-timer 10**

Parameters *seconds* — Specifies the number of seconds for the boot-timer.

Values 0— 600 seconds

es-activation-timer

Syntax **es-activation-timer** *seconds*

Context config>redundancy>bgp-evpn-multi-homing

Description This command configures the global ethernet-segment activation timer. The **es-activation-timer** delays the activation of a given ethernet-segment on a given PE that has been elected as DF (Designated Forwarder). Only when the **es-activation-timer** has expired, the SAP/SDP-binding associated to an ethernet-segment can be activated (in case of single-active multi-homing) or added to the default-multicast-list (in case of all-active multi-homing).

The **es-activation-timer** configured at the ethernet-segment level supersedes this global **es-activation-timer**.

Default **es-activation-timer 3**

Parameters *seconds* — Specifies the number of seconds for the **es-activation-timer**.

Values 0— 100 seconds

cfm-mac-advertisement

Syntax **cfm-mac-advertisement**
[**no**] **cfm-mac-advertisement**

Context config>service>vpls>bgp-evpn

Description This command enables the advertisement and withdrawal, as appropriate, of the IEEE MAC address associated with the MP (MEP & MIP) created on a SAP, Spoke or Mesh, in an EVPN service.

The up-date occurs each time an MP is added or deleted, or an IEEE MAC address is changed for an MP on a SAP, Spoke or Mesh within the service. The size of the update depends on the number of MPs in the service affected by the modification.

Note that you should only enable this functionality, as required, for services that require a resident MAC address to properly forward unicast traffic and that do not perform layer two MAC learning as part of the dataplane.

Local MP IEEE MAC addresses are not stored in the local FDB and, as such, cannot be advertised through a control plane to a peer without this command.

The **no** version of the command disables the functionality and withdraws all previously advertised MP IEEE MAC addresses.

evi

Syntax **evi** *value*
[**no**] **evi**

Context config>service>vpls>bgp-evpn

Description This command allows you to specify a 2-byte EVPN instance unique in the system. It is used for the service-carving algorithm for multi-homing and auto-deriving route-target and route-distinguishers.

If not specified, the value will be zero and no route-distinguisher or route-targets will be auto-derived from it. If the *evi* value is specified and no other route-distinguisher/route-target are configured in the service, then the following rules apply:

- the route distinguisher is derived from <system_ip>:evi
- the route-target is derived from <autonomous-system>:evi

Note that if vsi-import/export polices are configured, the route-target must be configured in the policies and those values take preference over the auto-derived route-targets. The operational route-target for a service will be shown in the **show service id bgp** command.

Parameters *value* — ISpecifies the *evi*.

Values 1 — 65535

ip-route-advertisement

Syntax **ip-route-advertisement** [**incl-host**]
no ip-route-advertisement

Context config>service>vpls>bgp-evpn

Description This command enables and disables the advertisement of IP prefixes in EVPN.If enabled, any active route in the R-VPLS VPRN route table will be advertised in EVPN using the VPLS BGP configuration. Note that the interface host addresses are not advertised in EVPN unless the **ip-route-advertisement incl-host** command is enabled.

Default no ip-route-advertisement

Parameters **incl-host —** Specifies to advertise the interface host addresses in EVPN

mac-advertisement

Syntax [**no**] **mac-advertisement**

Context config>service>vpls>bgp-evpn

Description The mac-advertisement command enables the advertisement in BGP of the learnt macs on SAPs and SDP bindings. When the mac-advertisement is disabled, the local macs will be withdrawn in BGP.

Default mac-advertisement

mac-duplication

Syntax **mac-duplication**

Context config>service>vpls>bgp-evpn

Description This command enables the context to configure the BGP EVPN mac duplication parameters.

detect

Syntax **detect num-moves** *num-moves* **window** *minutes*

Context config>service>vpls>bgp-evpn>mac-duplication

Description The **mac-duplication** featured is always enabled by default. This command modifies the default behavior. **mac-duplication** monitors the number of moves of a MAC address for a period of time (window).

Default num-moves 5 window 3

Parameters **num-moves** *num-moves* — Identifies the number of MAC moves in a VPLS service. The counter is incremented when a given MAC is locally relearned in the FDB or flushed from the FDB due to the reception of a better remote EVPN route for that MAC.

Values 3..10 minutes

Default 3 minutes

window *minutes* — Specifies the length of the window in minutes.

Values 1 — 15

Default 3

retry

Syntax **retry** *minutes*
no retry

Context config>service>vpls>bgp-evpn>mac-duplication

Description Specifies the timer after which the MAC in hold-down state is automatically flushed and the mac-duplication process starts again. This value is expected to be equal to two times or more than that of window.

If **no** retry is configured, this implies that, once mac-duplication is detected, mac updates for that mac will be held down till the user intervenes or a network event (that flushes the mac) occurs.

Default 9 minutes

Parameters *minutes* — Specifies the BGP EVPN MAC duplication retry in minutes.

Values 2 — 60 minutes

mpls

Syntax **mpls**

Context config>service>vpls>bgp-evpn

Description This command enables the context to configure the BGP EVPN MPLS parameters.

auto-bind-tunnel

Syntax **auto-bind-tunnel**

Context config>service>vpls>bgp-evpn>mpls

Description This command enables the context to configure automatic binding of a BGP-EVPN service using tunnels to MP-BGP peers.

The **auto-bind-tunnel** node is simply a context to configure the binding of EVPN routes to tunnels. The user must configure the **resolution** option to enable auto-bind resolution to tunnels in TTM. The following configurations are available:

- If the **resolution** option is explicitly set to **disabled**, the auto-binding to the tunnel is removed.

- If **resolution** is set to **any**, then any supported tunnel type in EVPN context will be selected following TTM preference.
- If one or more explicit tunnel types are specified using the **resolution-filter option**, then only these tunnel types will be selected again following the TTM preference.

The following tunnel types are supported in a BGP-EVPN MPLS context in order of preference: RSVP, LDP, Segment Routing (SR), and BGP.

The **ldp** value instructs BGP to search for an LDP LSP with a FEC prefix corresponding to the address of the BGP next-hop.

The **rsvp** value instructs BGP to search for the best metric RSVP LSP to the address of the BGP next-hop. This address can correspond to the system interface or to another loopback used by the BGP instance on the remote node. The LSP metric is provided by MPLS in the tunnel table. In the case of multiple RSVP LSPs with the same lowest metric, BGP selects the LSP with the lowest tunnel-id.

When the **sr-isis** (**sr-ospf**) value is enabled, a SR tunnel to the BGP next-hop is selected in the TTM from the lowest numbered ISIS (OSPF) instance.

The **bgp** value instructs BGP EVPN to search for a BGP LSP to the address of the BGP next-hop.

The user must set **resolution** to **filter** to activate the list of tunnel-types configured under **resolu-tion-filter**.

resolution

Syntax **resolution {disabled|any|filter}**

Context config>service>vpls>bgp-evpn>mpls>auto-bind-tunnel

Description This command configures the resolution mode in the automatic binding of a BGP-EVPN MPLS service to tunnels to MP-BGP peers.

Parameters **any —** enables the binding to any supported tunnel type in a BGP-EVPN MPLS context following TTM preference.

disabled — disables the automatic binding of a BGP-EVPN MPLS service to tunnels to MP-BGP peers.

filter — enables the binding to the subset of tunnel types configured under **resolution-filter**.

resolution-filter

Syntax **resolution-filter**

Context config>service>vpls>bgp-evpn>mpls>auto-bind-tunnel

Description This command enables the context that allows the configuration of the subset of tunnel types that can be used in the resolution of BGP-EVPN routes within the automatic binding of BGP-EVPN MPLS service to tunnels to MP-BGP peers.

The following tunnel types are supported in a BGP-EVPN MPLS context in order of preference: RSVP, LDP, Segment Routing (SR), and BGP.

bgp

Syntax **[no] bgp**

Context config>service>vpls>bgp-evpn>mpls>auto-bind-tunnel>resolution-filter

Description Selects the BGP tunnel type.

ldp

Syntax **[no] ldp**

Context config>service>vpls>bgp-evpn>mpls>auto-bind-tunnel>resolution-filter

Description Selects the LDP tunnel type.

rsvp

Syntax **[no] rsvp**

Context config>service>vpls>bgp-evpn>mpls>auto-bind-tunnel>resolution-filter

Description Selects the RSVP-TE tunnel type.

sr-isis

Syntax **[no] sr-isis**

Context config>service>vpls>bgp-evpn>mpls>auto-bind-tunnel>resolution-filter

Description Selects the Segment Routing (SR) tunnel type programed by an ISIS instance in TTM..

sr-ospf

Syntax **[no] sr-ospf**

Context config>service>vpls>bgp-evpn>mpls>auto-bind-tunnel>resolution-filter

Description Selects the Segment Routing (SR) tunnel type programed by an OSPF instance in TTM.

control-word

Syntax **control-word**
no control-word

Context config>service>vpls>bgp-evpn>mpls

Description This command enables the transmission and reception of the **control-word**. As defined in RFC7432, the use of the control-word helps avoid frame disordering.

It is enabled or disabled for all EVPN-MPLS destinations at the same time.

Default **no control-word**

ecmp

Syntax **ecmp** *value*

Context config>service>vpls>bgp-evpn>mpls

Description This command controls the number of paths to reach a given MAC address when that MAC in the FDB is associated to a remote all-active multi-homed ethernet-segment.

The configuration of 2 or more ecmp paths to a given MAC enables the 'aliasing' function described in RFC7432.

Parameters *value* — Specifies the number of paths allowed to the same multi-homed MAC address, assuming the MAC is located in an all-active multi-homed ethernet-segmen.

Values 0 — 32

Default 0

force-vlan-vc-forwarding

Syntax **force-vlan-vc-forwarding**
no force-vlan-vc-forwarding

Context config>service>vpls>bgp-evpn>mpls

Description This command allows the system to preserve the vlan-id and 802.1p bits of the service-delimiting qtag in a new tag added in the customer frame before sending it to the EVPN-MPLS destinations.

Note that this command may be used in conjunction with the **sap ingress vlan-translation** command. If so used, the configured translated vlan-id will be the vlan-id sent to the EVPN-MPLS destinations as opposed to the service-delimiting tag vlan-id. If the ingress SAP/SDP binding is 'null'-encapsulated, the output vlan-id and pbits will be zero.

Default **no force-vlan-forwarding**

ingress-replication-bum-label

Syntax **[no] no-ingress-replication-bum-label**

Context config>service>vpls>bgp-evpn>mpls

Description This command allows the user to configure the system so that a separate label is sent for BUM (Broadcast, Unknown unicast and Multicast) traffic in a given service. By default (**no ingress-replication-bum-label**), the same label is used for unicast and flooded BUM packets when forwarding traffic to remote PEs.

When saving labels, this might cause transient traffic duplication for all-active multi-homing. By enabling **ingress-replication-bum-label**, the system will advertise two labels per EVPN VPLS instance, one for unicast and one for BUM traffic. The ingress PE will use the BUM label for flooded traffic to the advertising egress PE, so that the egress PE can determine if the unicast traffic has been flooded by the ingress PE. Depending on the scale required in the network, the user may choose between saving label space or avoiding transient packet duplication sent to an all-active multi-homed CE for certain macs.

Default **no ingress-replication-bum-label**

shutdown

Syntax **[no] shutdown**

Context config>service>vpls>bgp-evpn>mpls

Description This command controls the administrative state of EVPN-MPLS in the service.

split-horizon-group

Syntax **split-horizon-group** *name*
no split-horizon-group

Context config>service>vpls>bgp-evpn>mpls

Description This command allows the user to configure an explicit split-horizon-group for all BGP-EVPN MPLS destinations that can be shared by other SAPs and/or spoke-SDPs. The use of explicit split-horizon-groups for EVPN-MPLS and spoke-SDPs allows the integration of VPLS and EVPN-MPLS networks.

If the **split-horizon-group** command for **bgp-evpn>mpls>** is not used, the default split-horizon-group (that contains all the EVPN destinations) is still used, but it is not possible to refer to it on SAPs/spoke-SDPs. User-configured split-horizon-groups can be configured within the service context. The same group-name can be associated to saps, spoke-sdps, pw-templates, pw-template-bindings and EVPN-MPLS destinations. The configuration of **bgp-evpn>mpls> split-horizon-group** will only be allowed if **bgp-evpn>mpls** is shutdown; no changes are allowed when bgp-evpn>mpls is **no shutdown**.

When the SAPs or/and spoke-SDPs (manual or BGP-AD-discovered) are configured within the same **split-horizon-group** as the EVPN-MPLS endpoints, MAC addresses will still be learned on them, but they will not be advertised in BGP-EVPN

Parameters *name* — Specifies the split-horizon-group name.

Default **no split-horizon-group**

unknown-mac-route

Syntax [**no**] **unknown-mac-route**

Context config>service>vpls>bgp-evpn

Description This command enables the advertisement of the unknown-mac-route in BGP. This will be coded in an EVPN mac route where the mac address is zero and the mac address length 48. By using this unknown-mac-route advertisement, the user may decide to optionally turn off the advertisement of MAC addresses learnt from saps and sdp-bindings, hence reducing the control plane overhead and the size of the FDB tables in the data center. All the receiving NVEs supporting this concept will send any unknown-unicast packet to the owner of the unknown-mac-route, as opposed to flooding the unknown-unicast traffic to all other nodes part of the same VPLS. Note that, although the 7x50 can be configured to generate and advertise the unknown-mac-route, the 7x50 will never honor the unknown-mac-route and will flood to the vpls flood list when an unknown-unicast packet arrives to an ingress sap/sdp-binding.

Use of the unknown-mac-route is only supported for BGP-EVPN VXLAN.

Default no unknown-mac-route

vxlan

Syntax **vxlan vni** *vni-id* **create**
no vxlan vni

Context config>service>vpls

Description This command enables the use of vxlan in the VPLS service.

Parameters **vni** *vni-id* **—** Specifies the VXLAN network identifier configured in the VPLS service. All the EVPN advertisements (MAC routes and inclusive multicast routes) for this services will encode the configured vni in the Ethernet Tag field of the NLRI.

Values 1 — 16777215

Note that the VPLS service will be operationally UP once the **vxlan vni** *vni-id* is successfully created. However, **bgp-evpn** must be enabled so that VXLAN bindings can be established and MAC learning and flooding can happen on them.

vxlan

Syntax **vxlan**

Context config>service>vpls>bgp-evpn

Description This command enables the context to configure the VXLAN parameters when BGP EVPN is used as the control plane.

shutdown

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

Context config>service>vpls>bgp-evpn>vxlan

Description This command enables/disables the automatic creation of VXLAN auto-bindings by BGP-EVPN.

Default shutdown

pbb

Syntax **pbb**

Context config>service>vpls

Description This command enables the context where the PBB parameters are configured.

use-es-bmac

Syntax **use-es-bmac**

Context config>service>vpls>pbb

Description This command is only supported in B-VPLS instances where BGP-EVPN is enabled and controls the source BMAC used by the system for packets coming from the SAP or spoke-SDPs when they belong to an EVPN ethernet-segment.

If enabled, the system will use a source BMAC derived from the source-bmac (high order four bytes) and the least significant two bytes configured in **config>service>system>bgp-evpn>ethernet-segment>source-bmac-lsb** for all the packets com-ing from the local ethernet-segment.

If **no use-es-bmac** is configured, the system will use the regular source-bmac (provided by the **config>service>vpls>pbb>source-bmac** command, or the chassis bmac if the source-bmac is not configured).

Default **no use-es-bmac**

proxy-arp

Syntax **proxy-arp**
no proxy-arp

Context config>service>vpls

Description This command enables the context to configure the proxy-ARP parameters in a VPLS service.

Default no proxy-arp

proxy-nd

Syntax **proxy-nd**
[no] proxy-nd

Context config>service>vpls

Description This command enables the context to configure the proxy-ND parameters in a VPLS service.

Default no proxy-arp

age-time

Syntax [**no**] **age-time** *seconds*

Context config>service>vpls>proxy-arp
config>service>vpls>proxy-nd

Description This command specifies the aging timer per proxy-ARP/proxy-ND entry for dynamic entries. When the aging expires, the entry is flushed. The age is reset when a new ARP/GARP/NA for the same MAC-IP is received. If the corresponding FDB mac entry is flushed, the proxy-ARP/proxy-ND entry goes inactive and subsequent ARP/NS lookups are treated as "missed". EVPN will withdraw the IP->MAC if the entry goes inactive. The **age-time** should be set at *send-refresh * 3* to ensure that no active entries are unnecessarily removed.

Default no age-time

Parameters *seconds* — Specifies the age-time in seconds.

Values 60— 86400

dup-detect

Syntax **dup-detect [anti-spoof-mac** *mac-address***] window** *minutes* **num-moves** *count* **hold-down** [*minutes*|*max*]

Context config>service>vpls>proxy-arp
config>service>vpls>proxy-nd

Description This command enables a mechanism that detects duplicate IPs and ARP/ND spoofing attacks. Attempts (relevant to dynamic and EVPN entry types) to add the same IP (different MAC) are monitored for **window** <*minutes*>. When <*count*> is reached within that **window**, the proxy-ARP/ND entry for the suspected IP is marked as duplicate. An alarm is also triggered. This condition is cleared when **hold-down** time expires (max does not expire) or a **clear** command is issued.

If the **anti-spoof-mac** is configured, the proxy-ARP/ND offending entry's MAC is replaced with this <*mac-address*> and advertised in an unsolicited GARP/NA for local SAP/SDP-bindings, and in EVPN to remote PEs. This mechanism assumes that the same **anti-spoof-mac** is configured in all the PEs for the same service and that traffic with destination **anti-spoof-mac** received on SAPs/SDP-bindings will be dropped. An ingress **mac-filter** must be configured in order to drop traffic to the **anti-spoof-mac**.

Default **dup-detect window 3 num-moves 5 hold-down 9**

Parameters *minutes* — Specifies the window size in minutes.

Values 1— 15

Default 3

count — Specifies the number of moves required so that an entry is declared duplicate.

Values 3— 10

Default 5

minutes|*max* — Specifies the hold-down time for a duplicate entry. Max means permanent hold-down.

Values 2— 60|*max*

Default 9

mac-address — Specifies the optional anti-spoof-mac to use.

dynamic-arp-populate

Syntax **[no] dynamic-arp-populate**

Context config>service>vpls>proxy-arp

Description This command enables the addition of dynamic entries to the proxy-ARP table (disabled by default). When executed, the system will populate proxy-ARP entries from snooped GARP/ARP messages on SAPs/SDP-bindings. These entries will be shown as dynamic.

When disabled, dynamic-arp entries will be flushed from the proxy-ARP table. Enabling dynamic-arp-populate is only recommended in networks with a consistent configuration of this command in all the PEs.

Default no dynamic-arp-populate

garp-flood-evpn

Syntax **[no] garp-flood-evpn**

Context config>service>vpls>proxy-arp

Description This command controls whether the system floods GARP-requests / GARP-replies to the EVPN. The GARPs impacted by this command are identified by the sender's IP being equal to the target's IP and the MAC DA being broadcast.

The **no** form of the command only floods to local saps/binds but not to EVPN destinations.

Disabling this command is only recommended in networks where CEs are routers that are directly connected to the PEs. Networks using aggregation switches between the host/routers and the PEs should flood GARP messages in the EVPN to ensure that the remote caches are updated and the BGP does not miss the advertisement of these entries.

Default garp-flood-evpn

send-refresh

Syntax [**no**] **send-refresh** *seconds*

Context config>service>vpls>proxy-arp
config>service>vpls>proxy-nd

Description If enabled, this command will make the system send a refresh at the configured time. A refresh message is an ARP-request message that uses 0s as sender's IP for the case of a proxy-ARP entry. For proxy-ND entries, a refresh is a regular NS message using the chassis-mac as MAC source-address.

Default no send-refresh

Parameters *seconds* — Specifies the send-refresh in seconds.

Values 120— 86400

static

Syntax **static** *ip-address ieee-address*
[no] static *ip-address*

Context config>service>vpls>proxy-arp

Description This command configures static entries to be added to the table. Note that a static MAC-IP entry requires the addition of the MAC address to the FDB as either learnt or CStatic (conditional static mac) in order to become active.

Parameters *ip-address* — Specifies the IPv4 address for the static entry.

ieee-address — Specifies the MAC address for the static entry.

table-size

Syntax **table-size** *table-size*

Context config>service>vpls>proxy-arp
config>service>vpls>proxy-nd

Description This command adds a table-size limit per service. By default, the table-size limit is 250; it can be set up to 16k entries per service. A non-configurable implicit high watermark of 95% and low watermark of 90% exists, per service and per system. When those watermarks are reached, a syslog/trap is triggered. When the system/service limit is reached, entries for a given IP can be replaced (a different MAC can be learnt and added) but no new IP entries will be added, regardless of the type (Static, evpn, dynamic). If the user attempts to change the **table-size** value to a value that cannot accommodate the number of existing entries, the attempt will fail.

Default **table-size** 250

Parameters *table-size* — Specifies the table-size as number of entries for the service.

Values 1— 16384

unknown-arp-request-flood-evpn

Syntax **[no] unknown-arp-request-flood-evpn**

Context config>service>vpls>proxy-arp

Description This command controls whether unknown ARP-requests are flooded into the EVPN network. By default, the system floods ARP-requests, including EVPN (with source squelching), if there is no active proxy-arp entry for the requested IP.

The **no** form of the command will only flood to local SAPs/SDP-bindings and not to EVPN destinations.

Default unknown-arp-request-flood-evpn

dynamic-nd-populate

Syntax **[no] dynamic-nd-populate**

Context config>service>vpls>proxy-nd

Description This command enables the addition of dynamic entries to the proxy-ND table. The command is disabled by default. When executed, the system will populate proxy-ND entries from snooped Neighbor Advertisement (NA) messages on SAPs/SDP-bindings, in addition to the entries coming from EVPN (if the EVPN is enabled). These entries will be shown as dynamic, as opposed to EVPN entries or static entries.

When disabled, dynamic-ND entries will be flushed from the proxy-ND table. Enabling **dynamic-nd-populate** is only recommended in networks with a consistent configuration of this command in all the PEs.

Default no dynamic-nd-populate

evpn-nd-advertise

Syntax **evpn-nd-advertise {host|router}**

Context config>service>vpls>proxy-nd

Description This command enables two different functions: on the one hand it enables the advertisement of static or dynamic entries that are learnt as host or routers (only one option is possible for a given service). On the other hand, it determines the R flag (host or router) when sending Neighbor Advertisement (NA) messages for existing EVPN entries in the proxy-ND table.

This command cannot be modified without **proxy-nd** *shutdown*.

Default evpn-nd-advertise router

host-unsolicited-na-flood-evpn

Syntax **[no] host-unsolicited-na-flood-evpn**

Context config>service>vpls>proxy-nd

Description This command controls whether the system floods host unsolicited Neighbor Advertisements to the EVPN. The NA messages impacted by this command are NA messages with the following flags: S=0 and R=0.

The **no** form of the command will only flood to local saps/binds but not to the EVPN destinations. This is only recommended in networks where CEs are routers that are directly connected to the PEs. Networks using aggregation switches between the host/routers and the PEs should flood unsolicited NA messages in the EVPN to ensure that the remote caches are updated and the BGP does not miss the advertisement of these entries.

Default host-unsolicited-na-flood-evpn

router-unsolicited-na-flood-evpn

Syntax **[no] router-unsolicited-na-flood-evpn**

Context config>service>vpls>proxy-nd

Description This command controls whether the system floods router unsolicited Neighbor Advertisements to EVPN. The NA messages impacted by this command are NA messages with the following flags: S=0 and R=1.

The **no** form of the command will only flood to local saps/binds but not to EVPN destinations. This is only recommended in networks where CEs are routers directly connected to the PEs. Networks using aggregation switches between the host/routers and the PEs should flood unsolicited NA messages in EVPN to ensure that the remote caches are updated and BGP does not miss the advertisement of these entries.

Default router-unsolicited-na-flood-evpn

static

Syntax **static** *ipv6-address ieee-address* **{host|router}**
[no] static *ipv6-address*

Context config>service>vpls>proxy-nd

Description This command configures static entries to be added to the table. Note that a static MAC-IP entry requires the addition of the MAC address to the FDB as either dynamic or CStatic (Conditional Static MAC) in order to become active. Along with the IPv6 and MAC, the entry must also be configured as either host or router. This will determine if the received NS for the entry will be replied with the R flag set to 1 (router) or 0 (host).

Default router-unsolicited-na-flood-evpn

Parameters *ipv6-address* — Specifies the IPv6 address for the static entry.

ieee-address — Specifies the MAC address for the static entry.

host — Specifies that the entry is type "host".

router — Specifies that the entry is type "router".

unknown-ns-flood-evpn

Syntax **[no] unknown-ns-flood-evpn**

Context config>service>vpls>proxy-nd

Description This command controls whether unknown Neighbor Solicitation messages are flooded into the EVPN network. By default, the system floods NS (with source squelching) to SAPs/SDP-bindings including EVPN, if there is no active proxy-nd entry for the requested IPv6.

The **no** form of the command will only flood to local SAPs/SDP-bindings but not to EVPN destinations.

Default unknown-ns-flood-evpn

shutdown

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

Context config>service>vpls>proxy-arp
config>service>vpls>proxy-nd

Description This command enables and disables the proxy-ARP and proxy-nd functionality. ARP/GARP/ND messages will be snooped and redirected to the CPM for lookup in the proxy-ARP/proxy-ND table. The proxy-ARP/proxy-ND table is populated with IP->MAC pairs received from different sources (EVPN, static, dynamic). When the **shutdown** command is issued, it flushes the dynamic/EVPN dup

proxy-ARP/proxy-ND table entries and instructs the system to stop snooping ARP/ND frames. All the static entries are kpet in the table as *inactive*, regardless of their previous *Status*.

Default shutdown

static-mac

Syntax **static-mac**

Context config>service>vpls

Description A set of conditional static MAC addresses can be created within a VPLS supporting bgp-evpn. Conditional static macs are also supported in B-VPLS with SPBM. Conditional Static MACs are dependent on the SAP/SDP state.

This command allows assignment of a set of conditional static MAC addresses to a SAP/ spoke-SDP. In the FDB, the static MAC is then associated with the active SAP or spoke SDP.

Static MACs are used for PBB Epipe and I-VPLS services that may terminate external to SPBM. If this is configured under a Control B-VPLS the interface referenced will not use IS-IS for this neighbor. This may also be configured under a User B-VPLS where the corresponding interface is not supported under the Control B-VPLS.

Static MACs configured in a bgp-evpn service are advertised as protected (EVPN will signal the mac as protected).

mac

Syntax **mac ieee-address** [**create**] **sap** *sap-id* **monitor** *fwd-status*
mac ieee-address [**create**] **spoke-sdp** *sdp-id:vc-id*] **monitor** *fwd-status*
no mac ieee-address

Context config>service>vpls>static-mac

Description This command assigns a conditional static MAC address entry to an SPBM B-VPLS SAP/spoke-SDP allowing external MACs for single and multi-homed operation.

This command also assigns a conditional static MAC address entry to an EVPN VPLS SAP/spoke-SDP.

Static MACs are used for PBB Epipe and I-VPLS services that may terminate external to SPBM. If this is configured under a Control B-VPLS the interface referenced will not use IS-IS for this neighbor. This may also be configured under a User B-VPLS where the corresponding interface is not supported under the Control B-VPLS.

Default none

Parameters **ieee-address** — Specifies the static MAC address to an SPBM/sdp-binding interface.

Values 6-byte mac-address (xx:xx:xx:xx:xx:xx or xx-xx-xx-xx-xx-xx). It cannot be all zeros.

create — This keyword is mandatory while creating a static MAC.

monitor *fwd-status* — Specifies that this static mac is based on the forwarding status of the SAP or spoke SDP for multi-homed operation.

evpn-tunnel

Syntax [**no**] **evpn-tunnel**

Context config>service>vprn>interface>vpls

Description This command enables and disables the evpn-tunnel mode for the attached R-VPLS. When enabled, no IP address will be required under the same interface.

Default no evpn-tunnel

vsd-domain

Syntax **vsd-domain** *name*
no vsd-domain

Context config>service>vpls
config>service>vprn

Description This command associates a previously configured vsd-domain to an existing VPRN or VPLS service. The vsd-domain is a tag used between the VSD and the 7x50 to correlate configuration parameters to a service.

Parameters *name* — Specifies the vsd-domain name.

vsd

Syntax **vsd**

Context config>service
config>service

Description This command provides the context for the vsd configuration.

domain

Syntax **domain** *name* **[type {l2-domain|vrf-gre|vrf-vxlan|l2-domain-irb}] [create]**
[no] domain *name*

Context config>service>vsd

Description This command configures a vsd-domain that can be associated to a VPLS or VPRN service.

Parameters **type** — specifies the type of domain. Vrf-gre can only be associated to a VPRN service. The other three types of domains must be associated to a VPLS service.

Values l2-domain | vrf-gre | vrf-vxlan | l2-domain-irb

create — Creates the vsd-domain.

description

Syntax **description** *description-string*

Context config>service>vsd>domain

Description This command provides a description for a vsd-domain. This description must be added before the domain can be no shutdown.

Parameters **description** — Specifies the text for the description.

service-range

Syntax **service-range** *svc-id* **to** *svc-id*
[no] service-range

Context config>service>vsd

Description This command configures the range of service identifiers that the system allows for dynamic services configured by python, when the Nuage VSD sends the service configuration parameters for the VSD fully-dynamic integration model

Parameters *svc-id* — specifies the start and end service identifier values.

Values 1— 2147483647

shutdown

Syntax **shutdown**
[no] shutdown

Context config>service>vsd>domain

Description This command enables or disables a domain. A description must be provided before no shutdown is executed.

system-id

Syntax **system-id** *name*
[no] system-id

Context config>system>vsd

Description This command configures the DC GW system-id that is used for the configuration from VSD. VSD will identify the DC GW based on this identifier, hence it must be unique per VSD.

Parameters *name* — Specifies the name.

xmpp

Syntax **xmpp**

Context config>system

Description This command provides the context for the xmpp configuration.

server

Syntax **server** *xmpp-server-name* [**domain-name** *fqdn*] [**username** *user-name*] [**password** *password*] [**create**]
[**no**] **server** *xmpp-server-name*

Context config>system>xmpp

Description This command configures the XMPP server as well as the Jabber ID that the 7x50 will use for the XMPP communication with the server. Note that the system uses DNS to resolve the configured domain-name.

no server *name* will remove all the dynamic configurations in all the services.

Parameters *xmpp-server-name* — Specifies the name of the server in lower-case letters.

fqdn — Specifies the Fully Qualified Domain Name of the server.

user-name — Specifies the user-name part of the Jabber ID.

password — Specifies the password part of the Jabber ID's user.

create — keyword used to create the server instance.

shutdown

Syntax **shutdown**
[no] shutdown

Context config>system>xmpp>server

Description This command enables or disables the communication with a given XMPP server. When the xmpp server is properly configured, **no shutdown** instructs the system to establish a TCP session with the XMPP server through the management interface first. If it fails to establish communication, the 7x50 uses an in-band communication and its system IP as source IP address. Shutdown does not remove the dynamic configurations.

security

Syntax **security**

Context config>system

Description This command enables the context for the configuration of the security parameters in the system.

cli-script

Syntax **cli-script**

Context config>system>security

Description This command enables the context for the configuration of the security parameters in the system.

authorization

Syntax **authorization**

Context config>system>security>cli-script

Description This command enables the context for the configuration of the authorization parameters for the cli-scripts in the system.

vsd

Syntax **vsd**

Context config>system>security>cli-script>authorization

Description This command enables the context for the configuration of the authorization parameters related to VSD in the system.

cli-user

Syntax **cli-user** *user-name*
no cli-user

Context config>system>security>cli-script>authorization>vsd

Description This command configures the cli-user for the configuration coming from VSD (fully dynamic VSD integration model). The user-profile determines what CLI set of commands can be executed by the VSD. This set of commands is a sub-set of the white-list of commands allowed by the system for the or VSD. You can use the **tools dump service vsd-services command-list** to check the white-list of commands.

Parameters *user-name* — Specifies the user-name that the VSD will use when adding a configuration to the system.

password

Syntax **password**

Context config>system>security>password

Description This command enables the context for the configuration of the passwords in the system.

vsd-password

Syntax **vsd-password** *password* [hash | hash2]
no vsd-password

Context config>system>security>password

Description This command configures the password required to access the **enable-vsd-config** mode. The **enable-vsd-config** mode allows editing of services provisioned by the VSD in fully dynamic mode (or by the **tools perform service vsd evaluate-script** command

Parameters *password* — Specifies the password required to login as authorized user in the **enable-vsd-config** mode.

hash | *hash2* — Specifies the hashing sequence.

router

Syntax **router**

Context config

Description This command enables the context for the configuration of the base router in the system.

bgp

Syntax **bgp**

Context config>router

Description This command enables the context for the configuration of the base router bgp parameters in the system.

group

Syntax **group** *name*

Context config>router>bgp

Description This command enables the context for the configuration of a bgp group in the base router.

neighbor

Syntax **neighbor** *ip-address*

Context config>router>bgp>group

Description This command enables the context for the configuration of a bgp group neighbor in the base router.

def-recv-evpn-encap

Syntax **def-recv-evpn-encap {mpls | vxlan}**

Context config>router>bgp>group>neighbor

Description This command defines how the BGP will treat a received EVPN route without RC5512 BGP encapsu-ation extended community. If no encapsulation is received, BGP will validate the route as MPLS or VXLAN depending on how this command is configured.

Default no def-recv-evpn-encap

Parameters **mpls** — Specifies that **mpls** is the default encapsulation value in the case where no RFC5512 extended community is received in the incoming BGP-EVPN route.

vxlan — Specifies that **vxlan** is the default encapsulation value.

python

Syntax **python**

Context config

Description This command enables the context for the configuration of the python parameters in the system.

python-policy

Syntax **python-policy** *name*

Context config>python

Description This command enables the context for the configuration of the python policy parameters in the system.

vsd

Syntax **vsd script** *script*
no vsd

Context config>python

Description This command defines the python script for the python-policy sent by the VSD.

Parameters *script* — Specifies the vsd script that points at the python-script command.

enable-vsd-config

Syntax **enable-vsd-config**
[no] enable-vsd-config

Context

Description This command allows editing of vsd services just like normal services. As this is an action that should only be executed by authorized personnel, the activation of this command is protected by the use of a password, defined under **configure system security password vsd-password**.

Show Commands

service-using

Syntax **service-using** [**vsd**]
service-using [**origin vsd**]

Context show>service

Description When the **vsd** modifier is used, this command displays the VSD domain tags used and the associated service identifier. If the modifier **origin vsd** is used, the command displays the services created by the VSD fully-dynamic integration model. (Python will actually create the service after receiving the relevant parameters from VSD).

Sample Output

```
*A:PE1# show service service-using vsd

==========================================
Services-using VSD Domain
==========================================
Svc Id     Domain
------------------------------------------
64000      L2-DOMAIN-5
------------------------------------------
Number of services using VSD Domain: 1
==========================================

*A:PE1# show service service-using origin vsd

===============================================================================
Services
===============================================================================
ServiceId    Type      Adm  Opr  CustomerId Service Name
-------------------------------------------------------------------------------
64000        VPLS      Up   Up   1          evi64000
-------------------------------------------------------------------------------
Matching Services : 1
-------------------------------------------------------------------------------
===============================================================================
```

system

Syntax **system**

Context show>service

Description This command enables the context to display the system parameters.

Sample Output

bgp-evpn

Syntax **bgp-evpn [ethernet-segment]**
bgp-evpn ethernet-segment name *name* [**all**] [**evi** *evi*] [**isid** *isid*]

Context show>service>system

Description This command shows all the information related to the base EVPN instance, including the base RD used for ES routes, the ethernet-segments or individual ethernet-segment information.

Sample Output

```
*A:PE1# show service system bgp-evpn

===============================================================================
Service BGP EVPN Information
===============================================================================
Evpn Route Dist.   : 192.0.2.69:0
===============================================================================

*A:PE1# show service system bgp-evpn ethernet-segment

===============================================================================
Service Ethernet Segment
===============================================================================
Name                            ESI                           Admin     Oper
-------------------------------------------------------------------------------
ESI-71                          01:00:00:00:00:71:00:00:00:01 Enabled   Up
-------------------------------------------------------------------------------
Entries found: 1
===============================================================================

*A:PE1# show service system bgp-evpn ethernet-segment name "ESI-71" all

===============================================================================
Service Ethernet Segment
===============================================================================
Name                    : ESI-71
Admin State             : Enabled            Oper State         : Up
ESI                     : 01:00:00:00:00:71:00:00:00:01
Multi-homing            : allActive          Oper Multi-homing  : allActive
Source BMAC LSB         : 71-71
ES BMac Tbl Size        : 8                  ES BMac Entries    : 1
Lag Id                  : 1
ES Activation Timer     : 0 secs
Exp/Imp Route-Target    : target:00:00:00:00:71:00

Svc Carving             : auto
ES SHG Label            : 262142
===============================================================================

===============================================================================
EVI Information
===============================================================================
```

```
EVI                 SvcId               Actv Timer Rem      DF
-------------------------------------------------------------------------------
1                   1                   0                   no
-------------------------------------------------------------------------------
Number of entries: 1
===============================================================================

-------------------------------------------------------------------------------
DF Candidate list
-------------------------------------------------------------------------------
EVI                                     DF Address
-------------------------------------------------------------------------------
1                                       192.0.2.69
1                                       192.0.2.72
-------------------------------------------------------------------------------
Number of entries: 2
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------

===============================================================================
ISID Information
===============================================================================
ISID                SvcId               Actv Timer Rem      DF
-------------------------------------------------------------------------------
20001               20001               0                   no
-------------------------------------------------------------------------------
Number of entries: 1
===============================================================================

-------------------------------------------------------------------------------
DF Candidate list
-------------------------------------------------------------------------------
ISID                                    DF Address
-------------------------------------------------------------------------------
20001                                   192.0.2.69
20001                                   192.0.2.72
-------------------------------------------------------------------------------
Number of entries: 2
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------

===============================================================================
BMAC Information
===============================================================================
SvcId                                   BMacAddress
-------------------------------------------------------------------------------
20000                                   00:00:00:00:71:71
-------------------------------------------------------------------------------
Number of entries: 1
===============================================================================
```

ethernet-segment

Syntax **ethernet-segment**

Context show>service>system>bgp-evpn

ethernet-segment name *name* **[all]**
ethernet-segment name *name* **evi** [*evi*]
ethernet-segment name *name* **isid** [*isid*]

Description This command enables the context to display the ethernet-segment parameters.

vsd

Syntax **vsd**

Context show>service

Description This command enables the context for the vsd parameters.

domain

Syntax **domain** *domain-name association*

Context show>service>vsd

Description This command shows all the parameters related to a VSD domain created by the user or by VSD.

Sample Output

```
*A:PE71(1)# show service vsd domain

===============================================================================
VSD Domain Table
===============================================================================
Name                                Type           Origin    Admin
-------------------------------------------------------------------------------
L2-DOMAIN-5                         l2Domain       vsd       inService
-------------------------------------------------------------------------------
Number of domain entries: 1
===============================================================================
*A:PE71(1)# show service vsd domain "L2-DOMAIN-5"

===============================================================================
VSD Information
===============================================================================
Name               : L2-DOMAIN-5
Description        : L2-DOMAIN-5
Type               : l2Domain                  Admin State   : inService
Last Error To Vsd  : (Not Specified)
Last Error From Vsd: (Not Specified)

Statistics
-------------------------------------------------------------------------------
Last Cfg Chg Evt   : 07/15/2015 21:20:23       Cfg Chg Evts  : 1
Last Cfg Update    : 07/15/2015 21:20:23       Cfg Upd Rcvd  : 1
Last Cfg Done      : 07/15/2015 21:20:23
Cfg Success        : 1                         Cfg Failed    : 0
Last Recd Params   : script = {'domain' : '', 'vn
```

```
                    : i' : '64000', 'rt' : 'target
                    : :64000:64000', 'rte' : 'targ
                    : et:64000:64000', 'servicetyp
                    : e' : 'L2DOMAIN', 'metadata'
                    : : 'rd=1:1, sap=1/1/10:3000 '
                    : }
Last Exec Params    : script = {'domain' : '', 'vn
                    : i' : '64000', 'rt' : 'target
                    : :64000:64000', 'rte' : 'targ
                    : et:64000:64000', 'servicetyp
                    : e' : 'L2DOMAIN', 'metadata'
                    : : 'rd=1:1, sap=1/1/10:3000 '
                    : }
===============================================================================
*A:PE71(1)# show service vsd domain "L2-DOMAIN-5" association

============================================================
Service VSD Domain
============================================================
Svc Id      Svc Type  Domain Type    Domain Admin   Origin
------------------------------------------------------------
64000       vpls      l2Domain       inService      vsd
------------------------------------------------------------
Number of entries: 1
============================================================
```

root-objects

Syntax **root-objects**

Context show>service>vsd

Description This command displays the root objects created by vsd.

Sample Output

```
*A:PE1# show service vsd root-objects

===============================================================================
VSD Dynamic Service Root Objects
===============================================================================
OID Prefix                  : svcRowStatus
OID index                   : .64000
Snippet name                : script
Snippet instance            : L2-DOMAIN-5
Orphan time                 : N/A
-------------------------------------------------------------------------------
No. of Root Objects: 1
===============================================================================
```

script

Syntax **script**

Context show>service>vsd

Description This command enables the context to show dynamic services script information.

snippets

Syntax **snippets [detail]**

Context show>service>vsd>script

Description This command displays the dynamic services snippets information. The CLI output generated by a single vsd service python function call is a snippet instance

Sample Output

```
*A:PE1# show service vsd script snippets name "script"

===============================================================================
VSD Dynamic Services Snippets
===============================================================================
Name                        Instance                     Ref-count  Dict-len
-------------------------------------------------------------------------------
script                      L2-DOMAIN-5                  0          126
-------------------------------------------------------------------------------
No. of Snippets: 1
===============================================================================

*A:PE1# show service vsd script snippets name "script" detail

===============================================================================
VSD Dynamic Service Snippets
===============================================================================
Snippet            : script:L2-DOMAIN-5
-------------------------------------------------------------------------------
reference-count    : 0
dictionary-length  : 126

Root-object
-----------
oid                : 0.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0

Reserved-id
-----------
id                 : service-id:64000
-------------------------------------------------------------------------------
No. of Snippets: 1
===============================================================================
```

statistics

Syntax **statistics**

Context show>service>vsd>script

Description This command displays vsd service script statistics. Only non-zero values are shown. The script statistics can be cleared with the "**clear service statistics vsd**" command.

Sample Output

```
*A:PE1# show service vsd script statistics

===============================================================================
VSD Dynamic Services Script Statistics
===============================================================================
Description                                                          Counter
-------------------------------------------------------------------------------
python scripts with 0 retries due to timeout                         1
setup    - jobs launched                                             1
setup    - jobs handled                                              1
setup    - success                                                   1
-------------------------------------------------------------------------------
No. of VSD Script Statistics: 4
-------------------------------------------------------------------------------
Last Cleared Time: N/A
===============================================================================
```

summary

Syntax **summary**

Context show>service>vsd

Description This command displays the global configuration summary for vsd services.

Sample Output

```
*A:PE1# show service vsd summary

===============================================================================
VSD Information
===============================================================================
Service Range
Start              : 64000                        End            : 65000
===============================================================================

===============================================================================
VSD Domain Table
===============================================================================
Name                                  Type           Origin    Admin
-------------------------------------------------------------------------------
L2-DOMAIN-5                           l2Domain       vsd       inService
-------------------------------------------------------------------------------
```

```
Number of domain entries: 1
==============================================================================
```

bgp-evpn

Syntax **bgp-evpn**

Context show>service>id

Description This command displays the bgp-evpn configured parameters for a given service, including the admin status of vxlan, the configuration for mac-advertisement and unknown-mac-route as well as the mac-duplication parameters. The command shows the duplicate mac addresses that mac-duplication has detected. This command also shows whether the **ip-route-advertisement** command (and the **incl-host** parameter) has been enabled. . If the service is bgp-evpn mpls, the command will show the parameters corresponding to evpn-mpls.

Sample Output

```
# bgp-evpn vxlan service

*A:DutA# show service id 1 bgp-evpn
===============================================================================
BGP EVPN Table
===============================================================================
MAC Advertisement  : Enabled            Unknown MAC Route  : Disabled
VXLAN Admin Status : Enabled            Creation Origin    : manual
MAC Dup Detn Moves : 5                  MAC Dup Detn Window: 3
MAC Dup Detn Retry : 9                  Number of Dup MACs : 1
IP Route Advertise*: Enabled            Include hosts      : Disabled
-------------------------------------------------------------------------------
Detected Duplicate MAC Addresses             Time Detected
-------------------------------------------------------------------------------
00:12:12:12:12:00                            01/17/2014 16:01:02
-------------------------------------------------------------------------------
===============================================================================
===============================================================================
BGP EVPN MPLS Information
===============================================================================
Admin Status       : Disabled
Force Vlan Fwding  : Disabled           Control Word       : Disabled
Split Horizon Group: (Not Specified)
Ingress Rep BUM Lbl: Disabled           Max Ecmp Routes    : 0
Ingress Ucast Lbl  : N/A                Ingress Mcast Lbl  : N/A
Entropy Label      : Disabled
===============================================================================
===============================================================================
BGP EVPN MPLS Auto Bind Tunnel Information
===============================================================================
Resolution         : disabled
Filter Tunnel Types: (Not Specified)
===============================================================================

# bgp-evpn mpls service

*A:DutA# show service id 1 bgp-evpn
```

```
===============================================================================
BGP EVPN Table
===============================================================================
MAC Advertisement  : Enabled            Unknown MAC Route  : Disabled
CFM MAC Advertise  : Enabled
VXLAN Admin Status : Disabled           Creation Origin    : manual
MAC Dup Detn Moves : 3                  MAC Dup Detn Window: 3
MAC Dup Detn Retry : 9                  Number of Dup MACs : 0
IP Route Advertise*: Disabled

EVI                : 1

-------------------------------------------------------------------------------
Detected Duplicate MAC Addresses            Time Detected
-------------------------------------------------------------------------------
-------------------------------------------------------------------------------
===============================================================================
* indicates that the corresponding row element may have been truncated.

===============================================================================
BGP EVPN MPLS Information
===============================================================================
Admin Status       : Enabled
Force Vlan Fwding  : Disabled           Control Word       : Disabled
Split Horizon Group: (Not Specified)
Ingress Rep BUM Lbl: Disabled           Max Ecmp Routes    : 4
Ingress Ucast Lbl  : 262142             Ingress Mcast Lbl  : 262142
Entropy Label      : Disabled
===============================================================================

===============================================================================
BGP EVPN MPLS Auto Bind Tunnel Information
===============================================================================
Resolution         : any
Filter Tunnel Types: (Not Specified)
===============================================================================
```

evpn-mpls

Syntax **evpn-mpls [esi** *esi***] [es-bmac** *ieee-address***]**

Context show>service>id

Description This command displays the existing EVPN-MPLS destinations for a given service and all related information. The command allows filtering based on **esi** (for EVPN multi-homing) and **es-bmac** (for PBB-EVPN multi-homing) to display the EVPN-MPLS destinations associated to an esi.

Sample Output

```
*A:PE1# show service id 1 evpn-mpls

===============================================================================
BGP EVPN-MPLS Dest
===============================================================================
TEP Address     Egr Label     Num. MACs   Mcast           Last Change
```

```
                Transport
-------------------------------------------------------------------------------
192.0.2.69      262140        0           Yes             07/15/2015 19:44:07
                ldp
192.0.2.69      262141        2           No              07/15/2015 19:44:07
                ldp
192.0.2.70      262139        0           Yes             07/15/2015 19:44:07
                ldp
192.0.2.70      262140        1           No              07/15/2015 19:44:07
                ldp
192.0.2.72      262140        0           Yes             07/15/2015 19:44:07
                ldp
192.0.2.72      262141        1           No              07/15/2015 19:44:07
                ldp
192.0.2.73      262139        0           Yes             07/15/2015 19:44:09
                ldp
192.0.2.254     262142        1           Yes             07/15/2015 19:44:31
                bgp
-------------------------------------------------------------------------------
Number of entries : 8
-------------------------------------------------------------------------------
===============================================================================

===============================================================================
BGP EVPN-MPLS Ethernet Segment Dest
===============================================================================
Eth SegId                       Num. Macs               Last Change
-------------------------------------------------------------------------------
01:00:00:00:00:71:00:00:00:01   2                       07/15/2015 20:41:09
01:74:13:00:74:13:00:00:74:13   1                       07/15/2015 20:41:07
-------------------------------------------------------------------------------
Number of entries: 2
-------------------------------------------------------------------------------
===============================================================================

===============================================================================
BGP EVPN-MPLS ES BMAC Dest
===============================================================================
vBmacAddr                       Num. Macs               Last Change
-------------------------------------------------------------------------------
No Matching Entries
===============================================================================

*A:PE1# show service id 1 evpn-mpls esi 01:00:00:00:00:71:00:00:00:01

===============================================================================
BGP EVPN-MPLS Ethernet Segment Dest
===============================================================================
Eth SegId                       Num. Macs               Last Change
-------------------------------------------------------------------------------
01:00:00:00:00:71:00:00:00:01   2                       07/15/2015 20:41:09
===============================================================================

===============================================================================
BGP EVPN-MPLS Dest TEP Info
===============================================================================
TEP Address             Egr Label               Last Change
                        Transport
-------------------------------------------------------------------------------
192.0.2.69              262141                  07/15/2015 20:41:09
                        ldp
```

```
192.0.2.72              262141                  07/15/2015 20:41:09
                        ldp
-------------------------------------------------------------------------------
Number of entries : 2
-------------------------------------------------------------------------------
===============================================================================

A:PE3# show service id 20000 evpn-mpls es-bmac 00:00:00:00:71:71

===============================================================================
BGP EVPN-MPLS ES BMAC Dest
===============================================================================
vBmacAddr                       Num. Macs               Last Change
-------------------------------------------------------------------------------
00:00:00:00:71:71               1                       07/15/2015 19:44:10
===============================================================================

===============================================================================
BGP EVPN-MPLS ES BMAC Dest TEP Info
===============================================================================
TEP Address             Egr Label               Last Change
                        Transport
-------------------------------------------------------------------------------
192.0.2.69              262138                  07/15/2015 19:44:10
                        ldp
-------------------------------------------------------------------------------
Number of entries : 1
-------------------------------------------------------------------------------
===============================================================================
```

esi

Syntax **esi** *esi*

Context show>service>id>evpn-mpls

Description This command shows the remote ethernet-segment identifiers as well as the BGP-EVPN MPLS destinations associated to them.

Sample Output

```
Add this sample:

*A:PE71(1)# show service id 1 evpn-mpls esi 01:00:00:00:00:71:00:00:00:01

===============================================================================
BGP EVPN-MPLS Ethernet Segment Dest
===============================================================================
Eth SegId                       Num. Macs               Last Change
-------------------------------------------------------------------------------
01:00:00:00:00:71:00:00:00:01   1                       07/17/2015 18:31:27
===============================================================================

===============================================================================
BGP EVPN-MPLS Dest TEP Info
===============================================================================
```

```
TEP Address             Egr Label               Last Change
                        Transport
-------------------------------------------------------------------------------
192.0.2.69              262141                  07/17/2015 18:31:26
                        ldp
192.0.2.72              262141                  07/17/2015 18:31:26
                        ldp
-------------------------------------------------------------------------------
Number of entries : 2
-------------------------------------------------------------------------------
===============================================================================
```

es-bmac

Syntax **es-bmac** *ieee-address*

Context show>service>id>evpn-mpls

Description This command shows the remote ethernet-segment BMACs as well as the BGP-EVPN MPLS destinations associated to them.

Sample Output

```
*A:PE70(4)# show service id 20000 evpn-mpls es-bmac 00:00:00:00:71:71

===============================================================================
BGP EVPN-MPLS ES BMAC Dest
===============================================================================
vBmacAddr                       Num. Macs               Last Change
-------------------------------------------------------------------------------
00:00:00:00:71:71               1                       07/15/2015 19:50:22
===============================================================================

===============================================================================
BGP EVPN-MPLS ES BMAC Dest TEP Info
===============================================================================
TEP Address             Egr Label               Last Change
                        Transport
-------------------------------------------------------------------------------
192.0.2.69              262138                  07/15/2015 19:50:22
                        ldp
192.0.2.72              262136                  07/15/2015 19:50:22
                        ldp
-------------------------------------------------------------------------------
Number of entries : 2
-------------------------------------------------------------------------------
===============================================================================
```

es-pbr

Syntax **es-pbr**

Context show>service>id

Description When a filter with an **action forward esi** is successfully added to a VPLS service and the PE receives an EVPN Auto-Discovery route for the configured ESI, this command displays the PBR VXLAN bindings auto-created, including the ESI, the VXLAN VTEP:VNI and the status of the binding.

Sample Output

```
A:PE1# show service id 301 es-pbr

===============================================================================
L2 ES PBR
===============================================================================
ESI                           Users      Status
                                         VTEP:VNI
-------------------------------------------------------------------------------
ff:00:00:00:00:00:00:00:01 1             Active
                                         192.0.2.72:7272
-------------------------------------------------------------------------------
Number of entries : 1
-------------------------------------------------------------------------------
===============================================================================
```

proxy-arp

Syntax **proxy-arp** *ip-address* **[detail]**

Context show>service>id

Description This command displays the proxy-ARP entries existing for a particular service. This table is populated by the EVPN mac routes containing a MAC and an IP address , as well as static entries or dynamic entries from snooped ARP messages on access SAP/SDP-bindings. A 7x50 receiving an ARP request from a SAP or SDP-binding will perform a lookup in the proxy-arp table for the service. If the 7x50 finds a match, it will reply to the ARP and will not let the ARP be flooded in the VPLS service. If the 7x50 does not find a match, the ARP will be flooded within the service if the configuration allows it. The command allows for an specific IP addresses to be shown.

Sample Output

```
*A:DutA# show service id 1 proxy-arp
-------------------------------------------------------------------------------
Proxy Arp
-------------------------------------------------------------------------------
Admin State       : enabled
Dyn Populate      : enabled
Age Time          : disabled           Send Refresh      : 120 secs
Table Size        : 250                Total             : 2
Static Count      : 0                  EVPN Count        : 0
```

```
Dynamic Count     : 2                   Duplicate Count   : 0

Dup Detect
-------------------------------------------------------------------------------
Detect Window     : 3 mins              Num Moves         : 5
Hold down         : 9 mins
Anti Spoof MAC    : None

EVPN
-------------------------------------------------------------------------------
Garp Flood        : enabled             Req Flood         : enabled
-------------------------------------------------------------------------------
===============================================================================

*A:DutA# show service id 1 proxy-arp detail
-------------------------------------------------------------------------------
Proxy Arp
-------------------------------------------------------------------------------
Admin State       : enabled
Dyn Populate      : enabled
Age Time          : disabled            Send Refresh      : 120 secs
Table Size        : 250                 Total             : 2
Static Count      : 0                   EVPN Count        : 0
Dynamic Count     : 2                   Duplicate Count   : 0

Dup Detect
-------------------------------------------------------------------------------
Detect Window     : 3 mins              Num Moves         : 5
Hold down         : 9 mins
Anti Spoof MAC    : None

EVPN
-------------------------------------------------------------------------------
Garp Flood        : enabled             Req Flood         : enabled
-------------------------------------------------------------------------------

===============================================================================
VPLS Proxy Arp Entries
===============================================================================
IP Address          Mac Address         Type      Status    Last Update
-------------------------------------------------------------------------------
10.10.10.1          00:ca:ca:ba:ca:01   dyn       active    07/15/2015 19:53:31
10.10.10.3          00:ca:ca:ba:ca:03   dyn       active    07/15/2015 19:53:21
-------------------------------------------------------------------------------
Number of entries : 2
===============================================================================
```

vxlan

Syntax **vxlan**
vxlan [**vtep** *ip-address*]

Context show>service>id
show>service

Description This command displays the VXLAN bindings auto-created in a given service. A VXLAN binding is composed of the remote VTEP (VXLAN Termination Endpoint) and the corresponding egress VNI

(VXLAN Network Identifier) to identify the service at the egress node. The command shows the number of MACs associated to each binding as well as the operational status and if the binding is part of the multicast list. The binding will be operationally down when the VTEP address is not found in the base routing table (the VTEP address cannot be reached). A binding will be part of the multicast list if a valid BGP EVPN inclusive multicast route exists for it.

Sample Output

```
*A:DutAA# show service id 101 vxlan
show service id 101 vxlan
===============================================================================
VPLS VXLAN, Ingress VXLAN Network Id: 101

===============================================================================
Egress VTEP, VNI
===============================================================================
VTEP Address           Egress VNI     Num. MACs    Mcast   Oper State   L2 PBR
-------------------------------------------------------------------------------
192.0.2.71             101            1            No      Up           No
-------------------------------------------------------------------------------
Number of Egress VTEP, VNI : 1
-------------------------------------------------------------------------------


A:DutB# show service vxlan <vtep>  192.0.2.65   192.0.2.66
A:DutB# show service vxlan 192.0.2.65
===============================================================================
VXLAN Tunnel Endpoint: 192.0.2.65
===============================================================================
Egress VNI                     Service Id               Oper State
-------------------------------------------------------------------------------
60                             60                       Up
-------------------------------------------------------------------------------
===============================================================================
```

evpn-mpls

Syntax **evpn-mpls [TEP** *ip-address***]**

Context show>service

Description This command shows the remote EVPN-MPLS tunnel endpoints in the system.

Sample Output

```
*A:PE70(4)# show service evpn-mpls

===============================================================================
EVPN MPLS Tunnel Endpoints
===============================================================================
EvpnMplsTEP Address EVPN-MPLS Dest      ES Dest             ES BMac Dest
-------------------------------------------------------------------------------
192.0.2.69          3                   1                   1
192.0.2.71          2                   0                   0
192.0.2.72          3                   1                   1
```

```
192.0.2.73          2                   1                   0
192.0.2.254         1                   0                   0
-------------------------------------------------------------------------------
Number of EvpnMpls Tunnel Endpoints: 5
-------------------------------------------------------------------------------
===============================================================================
*A:PE70(4)# show service evpn-mpls
<TEP ip-address>
 192.0.2.69   192.0.2.71   192.0.2.72   192.0.2.73   192.0.2.254

*A:PE70(4)# show service evpn-mpls 192.0.2.69

===============================================================================
BGP EVPN-MPLS Dest
===============================================================================
Service Id                              Egr Label
-------------------------------------------------------------------------------
1                                       262140
1                                       262141
20000                                   262138
-------------------------------------------------------------------------------
===============================================================================

===============================================================================
BGP EVPN-MPLS Ethernet Segment Dest
===============================================================================
Service Id          Eth Seg Id                              Egr Label
-------------------------------------------------------------------------------
1                   01:00:00:00:00:71:00:00:00:01           262141
-------------------------------------------------------------------------------
===============================================================================

===============================================================================
BGP EVPN-MPLS ES BMac Dest
===============================================================================
Service Id              ES BMac                 Egr Label
-------------------------------------------------------------------------------
20000                   00:00:00:00:71:71       262138
-------------------------------------------------------------------------------
===============================================================================
```

server

Syntax **server** [*name*]

Context show>system>xmpp

Description This command shows the connectivity to the XMPP server, including the configured parameters and statistics. When the user provides the name of the server, a detailed view is shown.

Sample Output

```
:sr12U-46-PE2# show system xmpp server

===============================================================================
XMPP Server Table
```

```
===============================================================================
Name                              User Name          State
 XMPP FQDN                         Last State chgd    Admin State
-------------------------------------------------------------------------------
vsd1-hy                           cspTest            Functional
 vsd1-hy.alu-srpm.us               0d 22:42:15        inService
-------------------------------------------------------------------------------
No. of XMPP server's: 1
===============================================================================
B:Dut# show system xmpp server "vsd1-hy"
===============================================================================
XMPP Server Table
===============================================================================
XMPP FQDN          : vsd1-hy.alu-srpm.us
XMPP Admin User    : cspTest
XMPP Oper User     : cspTest
State Lst Chg Since: 0d 22:40:16        State              : Functional
Admin State        : Up                 Connection Mode    : outOfBand
Auth Type          : md5
IQ Tx.             : 306                IQ Rx.             : 306
IQ Error           : 72                 IQ Timed Out       : 0
IQ Min. Rtt        : 100 ms             IQ Max. Rtt        : 450 ms
IQ Ack Rcvd.       : 234
Push Updates Rcvd  : 41                 VSD list Upd Rcvd  : 91
Msg Tx.            : 279                Msg Rx.            : 207
Msg Ack. Rx.       : 135                Msg Error          : 72
Msg Min. Rtt       : 0 ms               Msg Max. Rtt       : 450 ms
Sub Tx.            : 1                  UnSub Tx.          : 0
Msg Timed Out      : 0

===============================================================================
```

vsd

Syntax **vsd** [*entry*]

Context show>system
show>system>xmpp

Description This command shows the connectivity to the VSD server, including the configured parameters and statistics. When the user provides the entry number of the VSD server as shown in the show system xmpp vsd command, a detailed view for that specific server is shown, including statistics.

Sample Output

```
:Dut# show system vsd
===============================================================================
VSD Information
===============================================================================
System Id               : SR12U-46-PE
GW Last Audit Tx Time   : 03/07/2000 04:07:06

Gateway Publish-Subscribe Information
-------------------------------------------------------------------------------
Subscribed              : True
Subscriber Name         : nuage_gateway_id_SR12U-46-PE
```

```
Last Subscription Time  : 03/06/2000 05:27:06
===============================================================================

*B:Dut# show system xmpp vsd
===============================================================================
Virtual Services Directory Table
===============================================================================
Id User Name                    Uptime             Status
-------------------------------------------------------------------------------
1  cna@vsd1-hy.alu-srpm.us/nua* 0d 22:45:39        Available
-------------------------------------------------------------------------------
No. of VSD's: 1
===============================================================================

*B:Dut# show system xmpp vsd 1
===============================================================================
VSD Server Table
===============================================================================
VSD User Name      : cna@vsd1-hy.alu-srpm.us/nuage
Uptime             : 0d 22:45:41        Status             : Available
Msg Tx.            : 282                Msg Rx.            : 209
Msg Ack. Rx.       : 136                Msg Error          : 73
Msg TimedOut       : 0                  Msg MinRtt         : 70 ms
Msg MaxRtt         : 450 ms

===============================================================================
```

domain

Syntax **domain** [domain-name] [**association**]

Context show>system>vsd

Description This command shows the different VSD domains configured in the system. If association is added, the VSD domain to service association is shown. If a specific domain-name is used, configuration event statistics are shown.

Sample Output

```
B:Dut# show service vsd domain
===============================================================================================
VSD Domain Table
===============================================================================================
Name                                    Type           Origin    Admin
-----------------------------------------------------------------------------------------------
nuage_401                               l2DomainIrb    manual    inService
nuage_402                               l2Domain       manual    inService
nuage_501                               l2Domain       manual    inService
nuage_502                               l2Domain       manual    inService
-----------------------------------------------------------------------------------------------
Number of entries: 4
===============================================================================================
*B:Dut# show service vsd domain "nuage_501"
===============================================================================================
VSD Information
===============================================================================================
Name               : nuage_501
```

```
Description        : nuage_501_l2_domain
Type               : l2Domain                      Admin State   : inService
Last Error To Vsd  : (Not Specified)
Last Error From Vsd: (Not Specified)

Statistics
-------------------------------------------------------------------------------
Last Cfg Chg Evt   : 01/01/2000 00:00:11          Cfg Chg Evts  : 0
Last Cfg Update    : 01/01/2000 00:00:11          Cfg Upd Rcvd  : 0
Last Cfg Done      : 01/01/2000 00:00:11
Cfg Success        : 0                            Cfg Failed    : 0
===============================================================================
*B:Dut# show service vsd domain "nuage_501" association
============================================================
Service VSD Domain
============================================================
Svc Id      Svc Type  Domain Type    Domain Admin   Origin
------------------------------------------------------------
501         vpls      l2Domain       inService      manual
------------------------------------------------------------
Number of entries: 1
============================================================
*B:sr12U-46-PE2# show service vsd domain association
==========================================
Services-using VSD Domain
==========================================
Svc Id     Domain
------------------------------------------
501        nuage_501
502        nuage_502
------------------------------------------
Number of services using VSD Domain: 2
==========================================
```

redundancy

Syntax **redundancy**

Context show

Description This command enables the context for the display of global redundancy parameters.

bgp-evpn-multi-homing

Syntax **bpg-evpn-multi-homing**

Context show>redundancy

Description This command shows the information related to the EVPN global timers.

Sample Output

```
*A:PE2# show redundancy bgp-evpn-multi-homing
```

```
===============================================================================
Redundancy BGP EVPN Multi-homing Information
===============================================================================
Boot-Timer              : 10 secs
Boot-Timer Remaining    : 0 secs
ES Activation Timer     : 3 secs
===============================================================================
```

Clear Commands

domain

Syntax **domain** [*name*]

Context clear>service>statistics>vsd

Description This command clears the statistics shown in the **show service vsd domain** *name* command.

Parameters *name* — specifies the vsd domain name.

scripts

Syntax **scripts**

Context clear>service>statistics>vsd

Description This command clears the statistics shown in the **show service vsd script statistics** command.

server

Syntax **server** [xmpp-server-name]

Context clear>system>statistics>xmpp

Description This command clears the statistics shown in the **show system xmpp server** *name* command.

Parameters *xmpp-server-name* — specifies the vsd domain name

ver

Syntax **server** [xmpp-server-name]

Context clear>system>statistics>xmpp

Description This command clears the statistics shown in the **show system xmpp server** *name* command.

Parameters *xmpp-server-name* — specifies the vsd domain name

Tools Commands

service

Syntax **service**

Context tools>dump

Description Use this command to configure tools to display service dump information.

id

Syntax **id** *service-id*

Context tools>dump

Description Use this command to configure parameters to display service ID information.

vxlan

Syntax **vxlan** [**clear**]

Context tools>dump>service>id

Description This command displays the number of times a service could not add a VXLAN binding or <VTEP, Egress VNI> due to the following limits:

The per System VTEP limit has been reached

The per System <VTEP, Egress VNI> limit has been reached

The per Service <VTEP, Egress VNI> limit has been reached

The per System Bind limit: Total bind limit or vxlan bind limit has been reached.

The command adds a **clear** option to clear the above statistics.

Sample Output

```
*A:PE63# tools dump service id 3 vxlan
VTEP, Egress VNI Failure statistics at 000 00:03:55.710:
statistics last cleared at 000 00:00:00.000:
      Statistic            |    Count
---------------------------+-------------
                      VTEP |          0
             Service Limit |          0
              System Limit |          0
   Egress Mcast List Limit |          0
Duplicate VTEP, Egress VNI |          1
```

dup-vtep-egrvni

Syntax **dup-vtep-egrvni** [**clear**]

Context tools>dump>service>vxlan

Description This command dumps the <VTEP, VNI> bindings that have been detected as duplicate attempts, i.e. an attempt to add the same binding to more than one service. The commands provides a **clear** option.

Sample Output

```
*A:PE71# tools dump service vxlan dup-vtep-egrvni
Duplicate VTEP, Egress VNI usage attempts at 000 00:03:41.570:
1. 10.1.1.1:100
```

usage

Syntax **usage**

Context tools>dump>service>id>evpn

Description This command shows the maximum number of EVPN-tunnel interface IP next-hops per R-VPLS as well as the current usage for a given R-VPLS service.

Sample Output

```
*A:PE71# tools dump service id 504 evpn usage
Evpn Tunnel Interface IP Next Hop: 1/8189
```

domain-to-vsd-mapping

Syntax **domain-to-vsd-mapping**

Context tools>dump>service

Description This command enables the context for the domain-to-vsd mappings.

domain

Syntax **domain name** *name*

Context tools>dump>service>domain-to-vsd-mapping

Description This command shows mapping of a given VSD to a vsd-domain.

Sample Output

```
Dut# tools dump service domain-to-vsd-mapping domain name "nuage_501"
===============================================================================
Domain to VSD Mapping
===============================================================================
Domain name                     VSD
-------------------------------------------------------------------------------
nuage_501                       cna@vsd1-hy.alu-srpm.us/nuage
===================================================================
```

xmpp

Syntax **xmpp**

Context tools>perform>system

Description This command enables the xmpp context.

vsd-refresh

Syntax **vsd-refresh**

Context tools>perform>system>xmpp

Description This command instructs the system to refresh immediately the list of VSDs and not to wait for the next VSD list audit that the system does periodically.

fd-domain-sync

Syntax **fd-domain-sync {full | diff}**

Context tools>perform>service>vsd

Description This command instructs the system to audit the VSD to get the "DIFF" list of even the "FULL" list of all the do-mains in the VSD .

evaluate-script

Syntax **evaluate-script domain-name** [*64 chars max*] **type** [*type*] **action** *script-action* [**vni** *vni-id*] [**rt-i** *ext-community*] [**rt-e** *ext-community*] [**metadata** *metadata*] **policy** *python-policy*

Context tools>perform>service>vsd

Description The command enables the user to test their setup, and modify and terardown python scripts in a lab environment without the need to be connected to a VSD. The successful execution of the command for action setup will create a vsd domain and the corresponding configuration, just as the system would do when the parameters are received from VSD .

Sample Output

```
*A:PE1# tools perform service vsd evaluate-script domain-name "L2-DOMAIN-5" type l2-
domain action setup policy "py-l2" vni 64000 rt-i target:64000:64000 rt-e tar-
get:64000:64000 metadata "rd=1:1, sap=1/1/10:3000"

Success
```

name

Syntax **name** [*name*] **refresh-config**

Context tools>perform>service>vsd>domain

Description This command instructs the system to refresh the configuration of a given domain immediately instead of waiting for the next audit interval.

bgp-evpn

Syntax **bpg-evpn**

Context tools>dump>service>system

Description This command enables the context for the bgp-evpn base instance.

ethernet-segment

Syntax **ethernet-segment** *name* **evi** *evi* **df**
ethernet-segment *name* **isid** *isid* **df**

Context tools>dump>service>system>bgp-evpn

Description This command shows the computed DF PE for a given evi or isid.

Sample Output

```
*A:PE2# tools dump service system bgp-evpn ethernet-segment "ESI-71" evi 1 df
[07/15/2015 21:52:08] Computed DF: 192.0.2.72 (Remote) (Boot Timer Expired: Yes)
*A:PE2# tools dump service system bgp-evpn ethernet-segment "ESI-71" isid 20001 df
[07/15/2015 21:52:21] Computed DF: 192.0.2.72 (Remote) (Boot Timer Expired: Yes)
```

evpn

Syntax **evpn**

Context tools>dump>service

Description This command enables the context for the global evpn parameters.

usage

Syntax **usage**

Context tools>dump>service>evpn

Description This command displays the consumed VXLAN EVPN resources in the system.

Sample Output

```
*A:PE71# tools dump service evpn usage

EVPN usage statistics at 000 02:01:03.810:

MPLS-TEP                                          :             5
VXLAN-TEP                                         :             2
Total-TEP                                         :      7/  8191

Mpls Dests (TEP, Egress Label + ES + ES-BMAC)     :            16
Vxlan Dests (TEP, Egress VNI)                     :             2
Total-Dest                                        :     18/131071

Sdp Bind +  Evpn Dests                            :     20/196607
RVPLS Egress VNI                                  :      1/40959
ES L2/L3 PBR                                      :      0/ 32767
```

vsd-services

Syntax **vsd-services**

Context tools>dump>service

Description This command enables the context for vsd-services commands..

command-list

Syntax **command-list**

Context tools>dump>service>vsd-services

Description This command displays the list of CLI nodes allowed in the VSD fully dynamic provisioning model. Python will have access to the shown nodes.

When access is granted to a node, all commands in that node are allowed; however, CLI nodes are only allowed if explicitly listed. Nodes in CLI are shown with a "+" in the CLI.

While you can navigate special "Pass through nodes" via these nodes, the commands in that node are not implicitly allowed. When configured in a service through VSD, these commands will not be shown in the 'info' output of the **config** command.

NOTE: A'node' implies leaf-nodes and leaf-table nodes in reality. A 'Leaf-table' is a sub-table that looks like a leaf (i.e. it is entered/displayed as a one-liner). An example of leaf-table node is / **configure rout-er policy-options prefix-list x prefix 0.0.0.0/0** - since you can have multiple instances of prefixes.

Debug Commands

xmpp

Syntax **xmpp [connection] [gateway] [message] [vsd] [iq] [all]**
[**no**] **xmpp**

Context debug>system

Description This command enables the debug for XMPP messages sent or received by the 7x50.

Parameters **connection —** filters only the messages related to the XMPP connection.

gateway — Filters the messages related to the gateway.

message — Filters only the messages.

vsd — Filters the vsd messages.

iq — Filters the IQ messages between the gateway and the vsd.

all — Includes all the above.

vsd

Syntax **vsd**

Context debug

Description This command enables the context for the debug vsd commands.

scripts

Syntax **scripts**
scripts event [cli] [errors] [executed-cmd] [state-change] [warnings]
scripts instance *instance* **event [cli] [errors] [executed-cmd] [state-change] [warnings]**

Context debug>vsd

Description This command enables the debug of the VSD fully dynamic integration scripts.

event

Syntax **[no] event**

Context debug>vsd>script

Description This command enables/disables the generation of all script debugging event output: cli, errors, executedcmd, warnings, state-change.

instance

Syntax **[no] instance** *instance*

Context debug>vsd>script

Description This command enables/disables the generation of script debugging for a specific instance

Parameters *instance* — Specifies the instance name.

cli

Syntax **[no] cli**

Context debug>vsd>script>event
debug>vsd>script>instance

Description This command enables/disables the generation of a specific script debugging event output: **cli**

errors

Syntax **[no] errors**

Context debug>vsd>script>event
debug>vsd>script>instance

Description This command enables/disables the generation of a specific script debugging event output: **errors**.

executed-cmd

Syntax **[no] executed-cmd**

Context debug>vsd>script>event
debug>vsd>iscript>nstance

Description This command enables/disables the generation of a specific script debugging event output: **execute-cmd**.

state-change

Syntax **[no] state-change**

Context debug>vsd>script>event

debug>vsd>script>instance

Description This command enables/disables the generation of a specific script debugging event output: **state-change**.

warnings

Syntax **[no] warnings**

Context debug>vsd>script>event

debug>vsd>script>instance

Description This command enables/disables the generation of a specific script debugging event output: **warnings**.