###### CoS Treatment of VRF-injected packets

***Objective:***

The objective of this section is to demonstrate how to re-mark the MPLS-TC bits on VRF-injected packets.

when the destination IP of a CPU generated packet is reachable via an IP path and a MPLS path, the MPLS path is chosen for certain control packets. This applies to CPU generated IP traffic, Control plane, OAM, etc.

Default VRF: Any locally generated packet with destination IP address available in the MPLS FTN table is considered VRF injected packet.

Custom VRF: Any locally generated packet destined for remote CE is considered VRF injected packet

These frames are injected into the forwarding plane, so that they can get the same QOS treatment in the VRF while the egress out of the port. In these cases, the internal-cos of the frame is derived from the default frame-to-cos map of the system. (The default frame-to-cos map associated with the VRF, “default-f2c”).

The “default-f2c” can be edited in the cli to change the DSCP to RCOS mapping for these packets.

Based on the assigned RCOS then these packets MPLS-TC bits can be modified as well.

By default, the BGP and LDP control packets are marked with DSCP 48 and PCP 6 when they egress out, while the OAM packets are marked with DSCP 0 and PCP 7.

***Pre-requisite:***

* An active L3-VPN set-up.
* Below is the table with the default outgoing DSCP and PCP mapping for the VRF Injected Packets.

|  |  |  |
| --- | --- | --- |
| **Control PDU** | **Outgoing PCP value** | **Outgoing DSCP value** |
| ICMPv6 (6VPE) | 7 | 0 |
| ICMPv4 | 7 | 0 |
| LDP INIT | 6 | 48 |
| LDP Keep Alive | 6 | 48 |
| LDP Address | 6 | 48 |
| LDP Label Mapping | 6 | 48 |
| BGP OPEN | 6 | 48 |

|  |  |  |
| --- | --- | --- |
| BGP Keep Alive | 6 | 48 |
| BGP Update | 6 | 48 |
| MPLS-OAM | 7 | 0 |
| LSP Ping | 7 | 0 |
| PW Ping | 7 | 0 |
| TCP 646: SYN, ACK | 6 | 48 |
| TCP 646: ACK | 6 | 48 |
| TCP 179: SYN | 6 | 48 |
| TCP 179: ACK | 6 | 48 |

***Procedure:***

* As stated above the when the above VRF injected packets egress out, the CPU set the DSCP on them of 0 and 46 respectively.
* As per the default-f2c map these frames are then internally marked for ICOS 0 and 48. Based on the ICOS then the outgoing MPLS-TC bits are determined.

5130-014-R201> show frame-to-cos-maps frame-to-cos-map default-f2c

+ FRAME TO COS MAP +

| KEY | VALUE |

+ + +

| Name | default-f2c |

| Map Entry | |

| Name | ip-dscp0-cos0-green |

| IP DSCP | 0 |

| Payload: CoS | 0 |

| Payload: Color | green |

| | |

| Name | ip-dscp48-cos48-green |

| IP DSCP | 48 |

| Payload: CoS | 48 |

| Payload: Color | green |

+ + +

* We can edit the default-f2c map to remap the ICOS values for these DSCP so that their MPLS- TC can now be re-marked on the egress.
* config

# frame-to-cos-maps frame-to-cos-map default-f2c

# map-entry ip-dscp48-cos48-green ip-dscp 48 cos 56 # map-entry ip-dscp0-cos0-green ip-dscp 0 cos 8

# exit # exit # exit

5130-014-R201> show frame-to-cos-maps frame-to-cos-map default-f2c

+ FRAME TO COS MAP +

| KEY | VALUE |

+ + +

| Name | default-f2c |

| Map Entry | |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| | | Name | | | ip-dscp0-cos0-green | | |
| | | IP DSCP | | | 0 | | |
| | | Payload: CoS | | | 8 | | |
| | | Payload: Color | | | green | | |
| | |  | | |  | | |
| | | Name | | | ip-dscp48-cos48-green | | |
| | | IP DSCP | | | 48 | | |
| | | Payload: CoS | | | 56 | | |
| | | Payload: Color | | | green | | |
| + |  | + |  | + |

***Test Case Results:***

Passed: Yes No Verified by Date/Time Comments