



Configuring Ethernet Dataplane Loopback

Ethernet data plane loopback provides a means for remotely testing the throughput of an Ethernet port.

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Prerequisites for Ethernet Data Plane Loopback

- Ethernet loopback sessions are supported only of EFPs (service instances, Ethernet flow points, EVCs).
- Dot1q tags are not configured for default and untagged EFPs.
- Ethernet loopback sessions are supported on dot1q or QinQ or untagged and default EFPs.
- Internal loopback sessions configured must be within the 1 GB reserved bandwidth.
- Internal loopback can be launched even when the physical interface port state is down.

Restrictions for Ethernet Data Plane Loopback

- If the facility loopback is active on either Nile 0 or Nile 1, then only the Ingress QoS policy works on this facility. Egress QoS for facility loopback does not work due to the platform restriction.
- Facility loopback behavior on Gibraltar: Ingress and egress QoS policies on the EFP/TEFP gets bypassed. There is no support to bypass Ingress/Egress Port level policies as it works as configured.
- Data plane loopback on routed port infrastructure is *not* supported.
- Etype, src-mac, or llc-oui based loopback traffic filtering is *not* supported.
- Port-level QoS is not bypassed. The egress port shaper cannot be bypassed.

- Port shaper on the ingress port in both external and internal loopback cannot be bypassed.
- Ethernet loopback is not supported on a range of dot1q tags.
- Default EFP loopback is *not* supported in the shutdown state.
- Loopback sessions cannot be initiated on a port that is configured with SPAN or RSPAN.
- During Internal loopback, MAC swap is not supported for multicast or broadcast traffic.
- Only one Ethernet loopback (terminal or facility) session can be active on an EFP at any instance.
- Egress span on the port and internal loopback on an EFP on the same port cannot be configured at the same time.
- Egress ACL is not supported on the EFP.
- A maximum number of 20 facility loopback sessions can be created per system, provided 16 sessions are with Dot1Q and 4 sessions are with Dot1Q and destination MAC address. This scale reduces if SPAN or RSPAN is configured.
- A maximum number of 12 terminal loopback sessions can be created per system, provided 8 sessions are with Dot1Q and 4 sessions are with Dot1Q and destination MAC address. This scale reduces if RSPAN or SADT is configured.
- Internal Ethernet Data Plane Loopback session can also be launched when the interface or port is in down state.
- We recommended to avoid performing any dynamic changes to the interface state when the Ethernet Data Plane Loopback (ELB) is configured on a port that is in the down state. There is a behavior change when interface is moved from up to down state, as internal ELB session will not be stopped or removed.
- Ethernet Data Plane Loopback is not supported with the XConnect service when the physical interface port state is down.
- Ethernet Data Plane Loopback will be affected on STP enabled interface.
- Dynamic addition of rewrite ingress tags with default EFP is not supported.
- Dynamic changes at EFP and interface level are not supported when Ethernet Data Plane Loopback is active.
- dot1q tag inclusion in the configuration for default and untagged EFP disables the Ethernet Data Plane Loopback.
- When loopback is configure for a default EFP on the interface, then all the traffic (ingressing) in this interface gets looped back.
- BFD flaps on enabling internal loopback and traffic looped back with line rate as both the traffic passes through the HPCT queue.
- If traffic is more than 650Mbps and if the packet size is less than a frame size of 64, then BFD and OSPF flaps are expected.

Information on Ethernet Data Plane Loopback

The Ethernet data plane loopback feature provides a means for remotely testing the throughput of an Ethernet port. You can verify the maximum rate of frame transmission with no frame loss. This feature allows for bidirectional or unidirectional throughput measurement, and on-demand/out-of-service (intrusive) operation during service turn-up. This feature supports two types of Ethernet loopback. RSP3 supports the following types of loopback from Cisco IOS XE Everest 16.5.1 release.

- Facility loopback (external)—Traffic loopback occurs at the Ingress interface. Traffic does not flow into the router for loopback.
- Terminal loopback (internal)—Traffic loopback occurs at the Egress interface. Traffic loopback occurs after the traffic flows into the router to the other interface.

QoS Support for Ethernet Data Plane Loopback

- Ingress QoS is bypassed in external loopback on service instances.
- Internal loopback sequence is as follows:
 - Ingress QoS
 - Egress QoS (egress port) (both, shaper and policer are supported).
 - Ingress QoS on ingress port and egress QoS on egress port (both, shaper and policer are supported) on the RSP3 module.
 - Ingress QoS on egress port and egress QoS on ingress port on the RSP3 module.
- All port-level and EFP-level QoS is applicable for internal Ethernet data plane loopback.
- For external Ethernet data plane loopback:
 - All port-level and EFP-level QoS is bypassed except for shaper.
 - Port-level shaper cannot be bypassed.

How to Configure Ethernet Data Plane Loopback

Enabling Ethernet Data Plane Loopback

```
enable
configure terminal
interface gigabitethernet 0/2/1
service instance 1 ethernet
encapsulation dot1q 100
bridge-domain 120
ethernet loopback permit external
end
```



Note ELB is supported using a MAC filter for UP-MEP session. If you are starting ELB without the MAC filter, the UP-MEP session will go DOWN.

Starting an Ethernet Data Plane Loopback Session



Note To start a loopback for untagged and default EFPs, dot1q and second-dot1q are not needed. Dot1q is *not* applicable to start a loopback session on the RSP3 module.



Note By default the session would be running for 300 seconds unless you explicitly specify and automatically stops after the session time expiry.

```
enable
configure terminal
ethernet loopback start local interface gigabitEthernet 0/4/1 service instance 10 external
 dot1q 10 cos 1 destination mac-address 0000.0000.0001 timeout none
end
This is an intrusive loopback and the packets matched with the service will not be able
to pass through.
Continue? (yes/[no]): yes
```

Dot1q and COS-based filtering is not supported on the RSP3 module.

```
enable
configure terminal
ethernet loopback start local interface gigabitEthernet 0/4/1 service instance 10 external
 destination mac-address 0000.0000.0001 timeout none
end
```

Configuration Examples

Example: Configuring External Loopback

This example shows how to configure external (facility) loopback.

```
Router(config)# interface gigabitEthernet 0/4/1
Router(config-if)# service instance 1 ethernet
Router(config-if-srv)# encapsulation dot1q 120
Router(config-if-srv)# bridge-domain 120
Router(config-if-srv)# ethernet loopback permit external
```

This example shows external (facility) loopback on the Gigabit Ethernet 0/4/1 interface:

```
interface GigabitEthernet0/4/1
 no ip address
 negotiation auto
```

```

service instance 10 ethernet
  encapsulation dot1q 10
  rewrite ingress tag pop 1 symmetric
  bridge-domain 10
  ethernet loopback permit external ===? For facility loopback
!
end

```

This example below shows how to start external (facility) loopback on the router. A warning message is displayed. Type **yes** to continue.

```

Router# ethernet loopback start local interface gigabitEthernet 0/4/1 service instance 10
external dot1q 10 cos 1
destination mac-address 0000.0000.0001 timeout none

```

```

This is an intrusive loopback and the packets matched with the service will not be able
to pass through.
Continue? (yes/[no]): yes

```



Note Dot1q and COS-based filtering is not supported on the RSP3 module.

Example: Configuring Terminal Loopback

This example shows how to configure internal (terminal) loopback.

```

Router(config)# interface gigabitEthernet 0/0/0
Router(config-if)# service instance 1 ethernet
Router(config-if-srv)# encapsulation dot1q 120
Router(config-if-srv)# bridge-domain 120
Router(config-if-srv)# ethernet loopback permit internal

```

This example shows internal (terminal) loopback on Gigabit Ethernet 0/0/0 interface:

```

interface TenGigabitEthernet0/0/0
  no ip address
  service instance 10 ethernet
  encapsulation dot1q 10
  rewrite ingress tag pop 1 symmetric
  bridge-domain 10
  ethernet loopback permit internal
!
end

```

Verifying Ethernet Data Plane Loopback

Example: Verifying Ethernet Dataplane Loopback

Use the `show ethernet loopback {active | permitted} [interface interface number]` command.

- The following example displays the loopback capabilities per interface. The output shows internal (terminal) loopback has been permitted on Ten Gigabit Ethernet 0/0/0 interface and external (facility) loopback has been permitted on Gigabit Ethernet 0/4/1 interface.

```

Router# show ethernet loopback permitted

```

```

-----
Interface                               SvcInst Direction
Dot1q/Dot1ad(s)                         Second-Dot1q(s)
-----
Te0/0/0                                  10                               Internal
10
Gi0/4/1                                  10                               External
10

```

- This example shows all active sessions on the router.

```
Router# show ethernet loopback active
```

```

=====
Loopback Session ID      : 1
Interface                 : GigabitEthernet0/4/1
Service Instance         : 10
Direction                 : External
Time out(sec)            : none
Status                    : on
Start time                : 10:31:09.539 IST Mon Aug 26 2013
Time left                 : N/A
Dot1q/Dot1ad(s)         : 10
Second-dot1q(s)         :
Source Mac Address       : Any
Destination Mac Address  : 0000.0000.0001
Ether Type                : Any
Class of service         : 1
Llc-oui                  : Any

Total Active Session(s)  : 1
Total Internal Session(s) : 0
Total External Session(s) : 1

```

- This example shows how to stop the sessions on the router.

```
Router# ethernet loopback stop local interface GigabitEthernet
0/4/1 id 1
```

Use Cases or Deployment Scenarios

ELB is Supported with MAC Filter for UP-MEP Session

In the following scenario, ELB is supported using a MAC filter for UP-MEP session. If you starting ELB with out MAC filter, the UP-MEP session will go DOWN.

```

enable
configure terminal
service instance 800 ethernet 800
encapsulation dot1q 800
service-policy input <NAME>
xconnect 2.2.2.2 880 encapsulation mpls
cfm mep domain <NAME> mpid 200
cos 7
ethernet loopback permit external
ethernet loopback permit internal

```

```
Router#ethernet loopback start local interface gi0/0/0 service instance 800 internal dot1q
800 destination mac-address f078.1685.313f timeout none
```

This is an intrusive loopback and the packets matched with the service will not be able to pass through. Continue? (yes/[no]): yes

```
Router#show ethernet cfm maintenance-points remote
```

```
-----
MPID  Domain Name                MacAddress          IfSt  PtSt
Lvl   Domain ID                    Ingress
RDI   MA Name                      Type Id            SrvcInst
      EVC Name                      Age
      Local MEP Info
-----
220   CCI                          f078.1685.313f     Up    Up
0     CCI                          Gi0/0/0:(2.2.2.2, 880)
-     800                          XCON N/A           800
      800                          0s
      MPID: 200 Domain: CCI MA: 800
```

```
Total Remote MEPs: 1
```

Additional References

Related Documents

Related Topic	Document Title
Cisco IOS commands	https://www.cisco.com/c/en/us/td/docs/ios-xml/ios/mcl/allreleasemcl/all-book.html

Standards and RFCs

Standard/RFC	Title
No specific Standards and RFCs are supported by the features in this document.	—

MIBs

MB	MIBs Link
—	To locate and download MIBs for selected platforms, Cisco IOS releases, and feature sets, use Cisco MIB Locator found at the following URL: http://www.cisco.com/go/mibs

Technical Assistance

Description	Link
<p>The Cisco Support website provides extensive online resources, including documentation and tools for troubleshooting and resolving technical issues with Cisco products and technologies.</p> <p>To receive security and technical information about your products, you can subscribe to various services, such as the Product Alert Tool (accessed from Field Notices), the Cisco Technical Services Newsletter, and Really Simple Syndication (RSS) Feeds.</p> <p>Access to most tools on the Cisco Support website requires a Cisco.com user ID and password.</p>	<p>http://www.cisco.com/cisco/web/support/index.html</p>

Feature Information for Ethernet Dataplane Loopback

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to www.cisco.com/go/cfn. An account on Cisco.com is not required.

Table 1: Feature Information for Ethernet Dataplane Loopback

Feature Name	Releases	Feature Information
Ethernet Dataplane Loopback	Cisco IOS XE Release 3.14.0S	This feature was introduced on the Cisco ASR 920 Series Aggregation Services Router (ASR-920-12CZ-A, ASR-920-12CZ-D, ASR-920-4SZ-A, ASR-920-4SZ-D, ASR-920-10SZ-PD, ASR-920-24SZ-IM, ASR-920-24SZ-M, ASR-920-24TZ-M) .