



Configuring Ethernet Dataplane Loopback

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

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New and Changed Information

Table 1: New and Changed Features

Feature	Description	Changed in Release	Where Documented
Ethernet data plane loopback. QoS for Ethernet loopback	This feature provides a means for remotely testing the throughput of an Ethernet port on the Cisco ASR 903 router.	Cisco IOS XE Release 3.11	Information on Ethernet Data Plane Loopback , on page 2 QoS Support for Ethernet Data Plane Loopback , on page 2

Prerequisites for Ethernet Data Plane Loopback

- Ethernet loopback sessions are supported only of EFPs (service instances, Ethernet flow points, EVCs).
- Dot1q tags must be configured while configuring Ethernet loopback sessions on EFPs. However, loopback sessions can be configured using dot1q/QinQ, even if the underlying EFP has the dot1q/QinQ range configured.

- Internal loopback sessions configured must be within the 1 GB reserved bandwidth.

Restrictions for Ethernet Data Plane Loopback

- 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.
- Internal and external loopbacks cannot be configured under EFP with encapsulation default or encapsulation untagged.
- 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.

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. Two types of Ethernet loopback is supported:

- 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), but the ingress port shaper will also take effect.

How to Configure Ethernet Data Plane Loopback

Enabling Ethernet Data Plane Loopback

SUMMARY STEPS

1. `enable`
2. `configure terminal`
3. `interface gigabitEthernet slot/subslot/port`
4. `service instance number ethernet [name]`
5. `encapsulation {dot1q|second-dot1q}`
6. `bridge-domain bridge-id`
7. `ethernet loopback permit {external|permit}`
8. `end`

DETAILED STEPS

	Command or Action	Purpose
Step 1	<p><code>enable</code></p> <p>Example: Router> <code>enable</code></p>	<p>Enables privileged EXEC mode.</p> <p>Enter your password if prompted.</p>
Step 2	<p><code>configure terminal</code></p> <p>Example: Router# <code>configure terminal</code></p>	<p>Enters global configuration mode.</p>
Step 3	<p><code>interface gigabitEthernet slot/subslot/port</code></p> <p>Example: Router (config)# <code>interface gigabitEthernet 0/2/1</code></p>	<p>Specifies an interface and enters interface configuration mode.</p> <ul style="list-style-type: none"> • <i>slot/subslot/port</i>—The location of the interface.
Step 4	<p><code>service instance number ethernet [name]</code></p> <p>Example: Router (config-if)# <code>service instance 1 ethernet</code></p>	<p>Configure an EFP (service instance) and enter service instance configuration) mode.</p> <ul style="list-style-type: none"> • number—Specifies the EFP identifier, an integer from 1 to 4000. • (Optional) ethernet name—Name of a previously configured EVC. You do not need to use an EVC name in a service instance.
Step 5	<p><code>encapsulation {dot1q second-dot1q}</code></p>	<p>Configure encapsulation type for the service instance.</p>

	Command or Action	Purpose
	<p>Example: Router(config-if-srv)# encapsulation dot1q 120</p>	<ul style="list-style-type: none"> • dot1q—Configure 802.1Q encapsulation. • second-dot1q—Configures double-tagged 802.1Q encapsulation. Matching criteria to be used to map QinQ frames ingress on an interface to the appropriate EFP.
Step 6	<p>bridge-domain <i>bridge-id</i></p> <p>Example: Router(config-if-srv)# bridge-domain 120</p>	<i>bridge-id</i> —Specifies the identifier for the bridge domain instance.
Step 7	<p>ethernet loopback permit {external permit}</p> <p>Example: Router(config-if-srv)# ethernet loopback permit external</p>	<p>Configures Ethernet permit external or internal loopback on a interface. External loopback allows loopback of traffic from wire. This command is supported under a service instance.</p> <ul style="list-style-type: none"> • external—Indicates facility loopback. • internal—Indicates terminal loopback.
Step 8	<p>end</p> <p>Example: Router# end</p>	Returns to privileged EXEC mode.

Starting an Ethernet Data Plane Loopback Session



Note

By default the session would be running for 300 seconds unless explicitly specified by the user and automatically stopped after the session time expiry.

SUMMARY STEPS

1. **enable**
2. **ethernet loopback start local interface** *interface-id* {**service instance** *id*} {**external** |**internal** } {**dot1q** *vlan-id*} [**second-dot1q** *inner-vlan-id*] [**cos** *cos-value*] [**destination mac-address** *mac-address*] [**timeout** {*seconds* |**none**}]

DETAILED STEPS

	Command or Action	Purpose
Step 1	enable	Enables privileged EXEC mode.

	Command or Action	Purpose
	Example: Router> enable	Enter your password if prompted.
Step 2	ethernet loopback start local interface <i>interface-id</i> { service instance <i>id</i> } { external internal } { dot1q <i>vlan-id</i> } [second-dot1q <i>inner-vlan-id</i>] [cos <i>cos-value</i>] [destination mac-address <i>mac-address</i>] [timeout { <i>seconds</i> none }]	Starts Ethernet external or internal loopback on the interface for a specific service. <ul style="list-style-type: none"> • <i>interface-id</i>—Specifies the interface. • service instance <i>id</i>—Specifies the service instance. • external—Indicates facility loopback. • internal—Indicates terminal loopback. • dot1q <i>vlan-id</i>—Specifies the s-tag of the packets to be loopbacked. If the filter option is not specified, all of the packets with all VLANs are eligible to be loopbacked. • (Optional) second-dot1q <i>inner-vlan-id</i>—Specifies the c-tag of the packets to be loopbacked. If the filter option is not specified, all of the packets with all inner VLANs are eligible to be loopbacked • (Optional) cos <i>cos-value</i>—Specifies the 802.1p/cos of the packets to be loopbacked. If the filter option is not specified, all of the packets with “Any” cos are eligible to be loopbacked. • (Optional) destination mac-address <i>mac-address</i>—Specifies the destination mac address of the packets to be loopbacked. If the filter option is not specified, all of the packets with “Any” destination mac are eligible to be loopbacked. • (Optional) timeout <i>seconds</i>—Sets a loopback timeout period. The range is from 1 to 90000 seconds (25 hours). The default is 300 seconds. • (Optional) timeout <i>none</i>—Sets the loopback to no timeout.

Configuration Examples

Example: Configuring External Loopback

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

```
Router(config)# interface gigabitEthernet 0/2/1
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**

Example: Configuring Terminal Loopback

This example shows internal (terminal) loopback on Gigabit Ethernet 0/4/1 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 ===? For Terminal Loopback
!
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
```

Example: Verifying Ethernet Dataplane Loopback