Configure Ethernet Service Activation Test

This chapter describes the Cisco IOS XR commands to configure Y.1564 - Ethernet Service Activation Test (SAT).

Table 1: Feature History

Feature Name	Release Information	Feature Description
Ethernet SAT Support for NCS4K-4H-QDD-P Line Card	Cisco IOS XR Release 6.5.35	You can now perform Ethernet Service Activation Test (SAT) on the NCS4K-4H-QDD-P Line Card. Ethernet SAT helps test service turn-up, installation, and troubleshooting of Ethernet-based services.
Y.1564 Ethernet SAT Support on Multi-chassis	Cisco IOS XR Release 6.5.32	Y.1564 – Ethernet SAT feature supports up to four parallel SAT sessions in single chassis and up to four parallel SAT sessions for each rack in multi-chassis.

Feature Name	Release Information	Feature Description
Y.1564 - Ethernet Service Activation Test (SAT)	Cisco IOS XR Release 6.5.31	Y.1564 – Ethernet SAT is a standards-based test methodology to test turn up, installation, and troubleshooting of Ethernet-based services. This test methodology allows you to measure Frame Transfer Delay (FTD) or latency and Frame Loss Ratio (FLR) parameters. Commands added: • ethernet service-activation-test • profile • outer-cos • duration • color-aware • information-rate • packet-size • show ethernet service-activation-test

Understanding Y.1564 - Ethernet Service Activation Test

Ethernet services have evolved significantly with the deployment of Ethernet in service provider networks. Ethernet is not only found at the User Network Interface (UNI) but can also be deployed anywhere in the network, creating a Network-to-Network Interface (NNI). With the capability to prioritize traffic, provide high availability, and offer built-in resiliency, service providers are now using Ethernet technology to deliver advanced services. In the absence of any standardized test methodologies that can measure delay and loss, the ITU-T Y.1564 recommendation addresses this gap.

Y.1564 - Ethernet Service Activation Test (SAT) is a testing procedure that tests service turn-up, installation, and troubleshooting of Ethernet-based services. This test methodology was created to establish a standard way of measuring Ethernet-based services in the industry.

Cisco's implementation of ITU-T Y.1564 has three key objectives:

- To serve as a network service level agreement (SLA) validation tool to validate that a service meets its guaranteed performance settings in a controlled test time.
- To verify that all the services carried by the network meet their SLA objectives at their maximum committed rate.
- To perform medium-term and long-term service testing, confirming that the network element can properly carry all the services while under stress during a soaking period.

The following Key Performance Indicators (KPI) metrics are collected to verify that the configured SLAs are met for the service or stream.

- Frame Transfer Delay (FTD) or latency: Measures the round-trip time (RTT) taken by a test frame to travel through a network device, or across the network and back to the test port.
- Frame Loss Ratio (FLR): Measures the number of packets lost from the total number of packets sent. Frame loss can be due to a number of issues such as network congestion or errors during transmissions.

Note
- Rewrite with POP option is supported with Color Blind mode with Outer-Cos value of 0.
- Rewrite with POP option is not supported when the second VLAN tag is "any".

Note The maximum number of parallel SAT sessions supported is four in single chassis and four for each rack in multi-chassis.

Note If the bundle interface has members on rack 1 and rack 2, the number of parallel SAT sessions supported is two in rack 1 and two in rack 2.

Supported Modes

The mode of operation that is supported for Y.1564 is the two-way statistics collection mode. In the two-way mode, the sender generates the test traffic used to perform the test, which is then looped back by the remote node. The statistics are measured and collected locally on the sender.

The following encapsulations are supported by Y.1564 SAT feature:

- dot1q
- dot1q + second dot1q
- dot1ad
- dot1ad + second dot1q
- priority tagged
- untagged

Supported Bandwidth Parameters

Bandwidth Parameters	Internal Direction	External Direction
Commited Information Rate	Y	Y
Exceeded Information Rate	Y	Y

SAT Target Matrix

Target	Internal Direction	External Direction
L2 Interface over physical main or sub interfaces	Y	Y
L2 Interface over bundle main or sub interfaces	Y	Y
L2 PW VPWS over physical main or sub interfaces	Y	Y
L2 PW VPWS over bundle main or sub interfaces	Y	Y
XConnect over physical main or sub interfaces	Y	Y
XConnect over bundle main or sub interfaces	Y	Y

Loopback for Y.1564 Service Activation Test

Table 2: Feature History

Feature Name	Release Information	Featur Description
Loopback for Y.1564 Service Activation Test	Cisco IOS XR Release 6.5.35	This feature enables the redirection of test traffic from the destination network to the source network in Loopback Message (LBM) format. The Loopback Message allows the measurement of various parameters and performance metrics, such as frame delay, frame loss rates, and QoS settings, after the traffic has completed its round trip. Such comprehensive measurement helps identify issues within the network setup. You can also use it to ensure the service is running and meets the SLA.

In a typical Y.1564 Service Activation Test scenario, traffic flows from a source network to a destination network. However, with the inclusion of the loopback-message packet format configuration, the traffic that reaches the destination network can be redirected back to the source network through a loopback interface. The data packets are then used in Loopback Message (LBM) format.

The collection of statistics start once the source network receives the test traffic from the destination.

Prior to Cisco IOS XR Software Release 6.5.35, tests were conducted independently in each direction, with traffic flowing from the source to the destination network. The data packets were used in Loss Measurement Message (LMM) format for Frame Loss (FL) measurement.

Configuring Color Profile for Ethernet SAT

The following example shows how to configure a color-blind profile for Ethernet SAT.

```
RP/0/RP0:hostname#configure
RP/0/RP0:hostname(config)#ethernet service-activation-test
RP/0/RP0:hostname(config-ethsat)#profile sattest1
RP/0/RP0:hostname(config-ethsat-prf)#outer-cos 4
RP/0/RP0:hostname(config-ethsat-prf)#duration 8 minutes
RP/0/RP0:hostname(config-ethsat-prf)#information-rate 11800 mbps
RP/0/RP0:hostname(config-ethsat-prf)#packet-size 1000
```

The following example shows how to configure a color-aware profile for Ethernet SAT.

```
RP/0/RP0:hostname#configure
RP/0/RP0:hostname(config)#ethernet service-activation-test
RP/0/RP0:hostname(config-ethsat)#profile sattest3
```

```
RP/0/RP0:hostname(config-ethsat-prf)#outer-cos 4
RP/0/RP0:hostname(config-ethsat-prf)#duration 1 minutes
RP/0/RP0:hostname(config-ethsat-prf)#color-aware cir 7 gbps eir-color cos 1
RP/0/RP0:hostname(config-ethsat-prf)#information-rate 8 gbps
RP/0/RP0:hostname(config-ethsat-prf)#packet-size 1000
```

Configuration Examples

The following example shows how to start service-activation test on an interface with external direction.

```
RP/0/RP0:hostname#ethernet service-activation-test start interface TenGigE 10/0/0/1 profile
 test destination 00ab.6009.9c3c direction external
```

The following example shows how to start service-activation test on an interface with internal direction.

```
RP/0/RP0:hostname#ethernet service-activation-test start interface TenGigE 10/0/0/1 profile
 test destination 00ab.6009.9c3c direction internal
```

The following example shows how to stop service-activation-test on an interface.

```
RP/0/RP0:hostname#ethernet service-activation-test stop interface TenGigE 10/0/0/1
```

The following example shows how to stop all service-activation-tests.

```
RP/0/RP0:hostname#ethernet service-activation-test stop all
```

Verification

To verify the interfaces on which Y.1564 is enabled, use the **show ethernet service-activation-test brief** command. The following is a sample output of an enabled device.

```
RP/0/RP0:hostname#show ethernet service-activation-test brief
Interface                   Permissions           Test Status
-------------------------------------------------------------------------------
Bundle-Ether10.1            Internal only       In progress, 1 min(s) left
Te0/0/0/9.2                 External only            None started
Te0/0/0/9.2                 Internal only            Completed
```