

Spirent Communications

Spirent TestCenter Software and Hardware New Features 5.23

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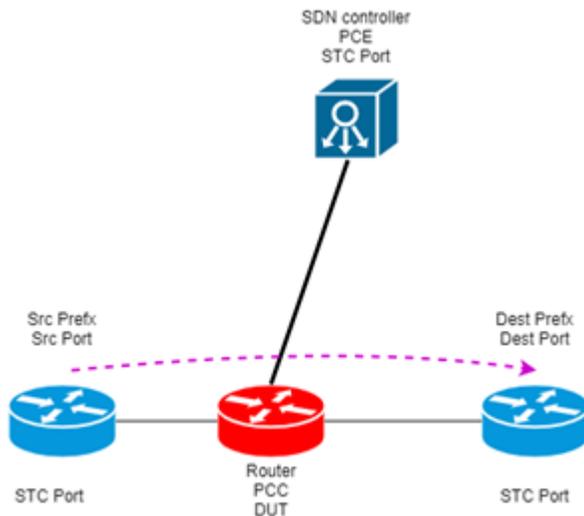
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New Products and Features

Software Features

PCEP Extensions for IPv4 Flow Specification

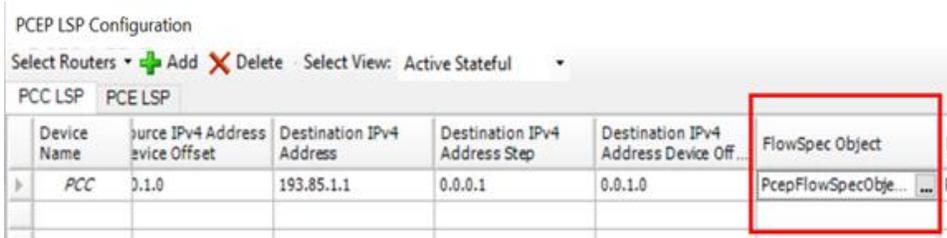
Spirent TestCenter release 5.23 enables IPv4 Flow Specification with PCEP. Flow Specifications categorize and describe traffic flows. Spirent TestCenter can emulate creation, update, and withdrawal of Flow Specifications via PCEP. PCInitiate, PCUpd, PCRpt, and PCReq messages are updated to contain FLOWSPEC objects.



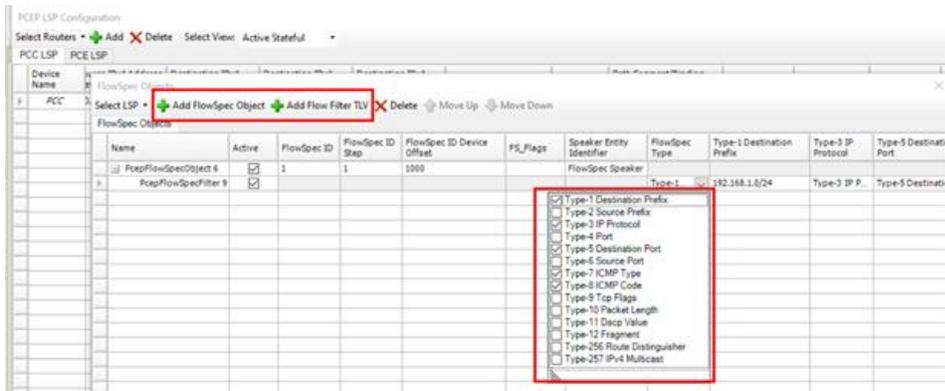
To emulate FlowSpec, it must be enabled in the PCEP page.

Emulated Device Interface				6rd/6to4	DS-Lite	PCEP	SR Capability Flags
Port Name	Device Name	Tags	Device Count			Enable FlowSpec Capability TLV	
Port //1/...	Device 1	Click to ad...	1			<input checked="" type="checkbox"/>	N Flag, X Flag
Port //1/...	Device 2	Click to ad...	1			<input checked="" type="checkbox"/>	

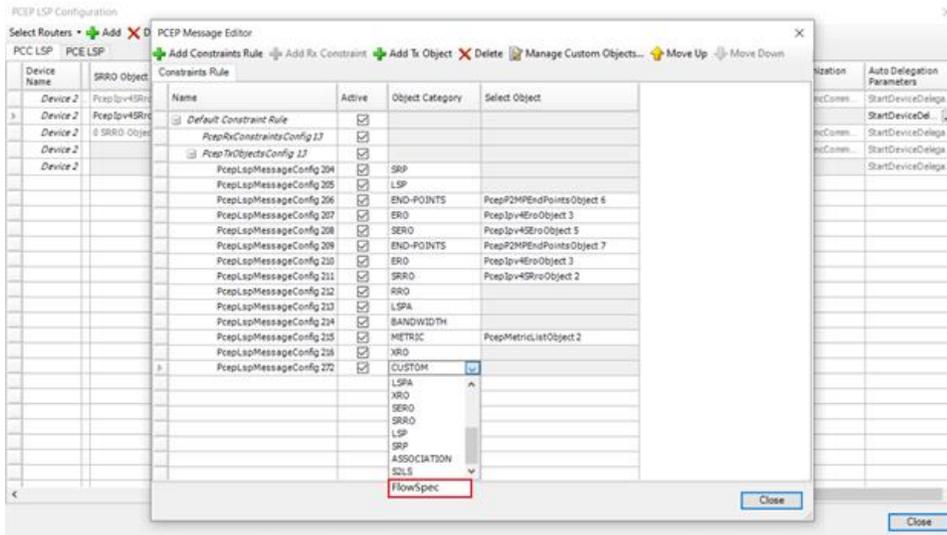
In the PCEP LSP configuration page, the FlowSpec Object is added for both PCC and PCE.



FlowSpec Objects for each LSP can be added, edited, or removed. Each FlowSpec Object can include up to 14 TLV types. After checking the TLV types in column FlowSpecType, these checked TLV types will be shown with default values that are editable.



Auto Command, Manual Command, and Command Sequencer all support FlowSpec Object.

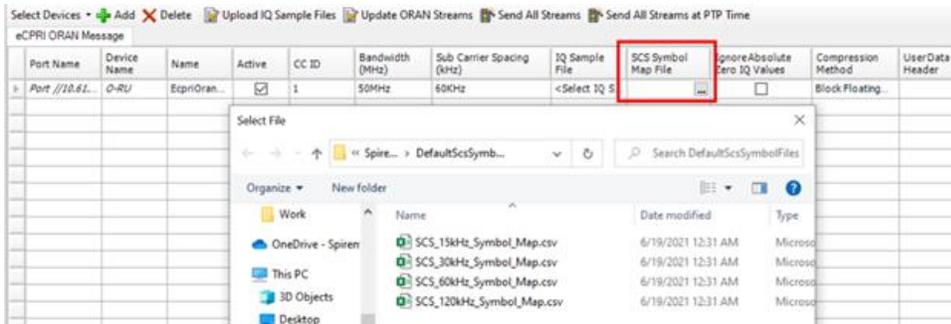


Wireshark-1.10.3-spirent_184 or later is required to decode the packet. This feature requires new license BPK-1383 PCEP CONTROLLER EMULATION FOR FLOWSPEC BASE PKG.

ORAN - Custom Slot Support

Spirent TestCenter release 5.23 supports customized O-RAN symbol map. Default symbol maps for 15KHz, 30KHz, 60KHz, and 120KHz subcarrier spacing are integrated with Spirent TestCenter. Users can also upload their own symbol map.

A new column “SCS Symbol Map File” is added in eCPRI ORAN Message page to select the symbol map file. After configuring the rest of the required ORAN message parameters and clicking “Update ORAN Streams,” the associated ORAN message streams will be generated.

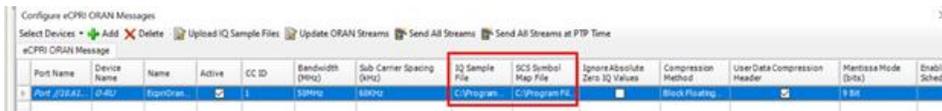


O-RU Emulation with PTP

Spirent TestCenter release 5.23 enables O-RU emulation, and it can work with or without PTP. First step is to configure the port as O-RU.



In the eCPRI ORAN Message page to upload the IQ Sample File and SCS symbol map file, and edit other parameters as needed. Then, click “Update ORAN streams” to generate ORAN message streams. Finally, click “Send All Streams” to trigger the package generation. If it must work with PTP, click “Send All Streams at PTP Time.” You must start PTP in advance.



The uplink data can be sent at a future time, you can set up Stream Start Time (absolute time) or configure the Start Time Offset at port.



In TestCenter IQ, CC ID, Data Direction, Section ID and Number of PRBs are applicable for O-RU analysis. Wireshark-1.10.3-spirent_194 is required to decode the packages correctly. This feature requires new license BPK-1385 O-RAN O-RU EMULATION BASE PKG.

L2TPv3 Configurable UDP Source Port over IPv6 Transport

Spirent TestCenter Release 5.23 added support for configurable L2TPv3 UDP source port over IPv6 transport for emulated LAC (L2TP access concentrator) and LNS (L2TP network server) devices.

To enable this feature, select an emulated LAC or LNS device with IPv6 encapsulation and click on the “L2TP” protocol tab. Set the “Version” field to “L2TP v3”, set the “Underlying Protocol” field to “UDP”, and configure the source port in the “UDP Source Port” field.

Emulated Device Interface												
PPPoX 6rd/6to4 DS-Lite L2TP												
Port Name	Device Name	Tags	Device Count	Active	L2TP Block State	Version	Emulation Mode	IP Encapsulation	Underlying Protocol	UDP Source Port	Hidden AVPs	Tunnel Count per LAC/LNS
Port //1/...	Device 1	Click to ad...	1	<input checked="" type="checkbox"/>	Idle	L2TP v3	LAC	IPv6	UDP	1702	Click to ed...	1
▶ Port //1/...	Device 2	Click to ad...	1	<input checked="" type="checkbox"/>	Idle	L2TP v3	LNS	IPv6	UDP	1702	Click to ed...	1

FRER Feature Support

Hardware supported:

- FRER Tx is supported in all hardware types.
- FRER Rx analysis is supported on test modules FX2-1G-Sx, MX2-1G-Sx, and NIC-65 in STC_ADV TSN mode.

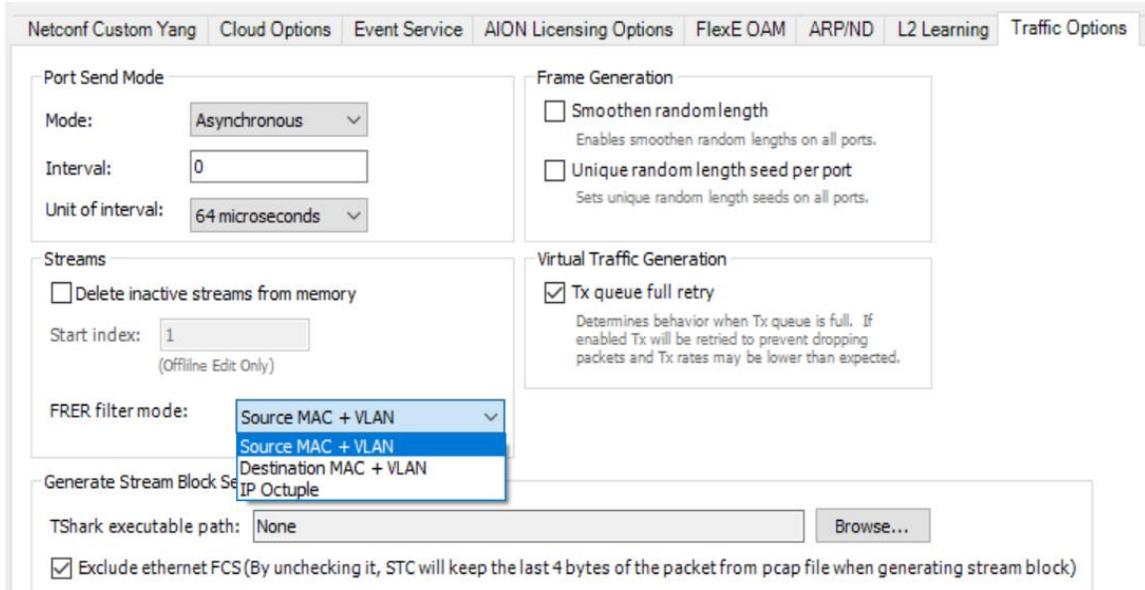
FRER features provide increased availability and reliability for a stream by replicating every packet over two or more network paths and generating sequence numbers for each replicated frame. The replication could happen in the source end stations and/or in relay systems in the network. The recovery mechanism works by eliminating duplicates based on the sequence numbers. The recovery and elimination could happen at the destination end stations and/or in other relay systems.

This feature enables Spirent TestCenter users to test:

- The sequence generation behavior of DUTs.
- The recovery and elimination behavior of end stations / bridges

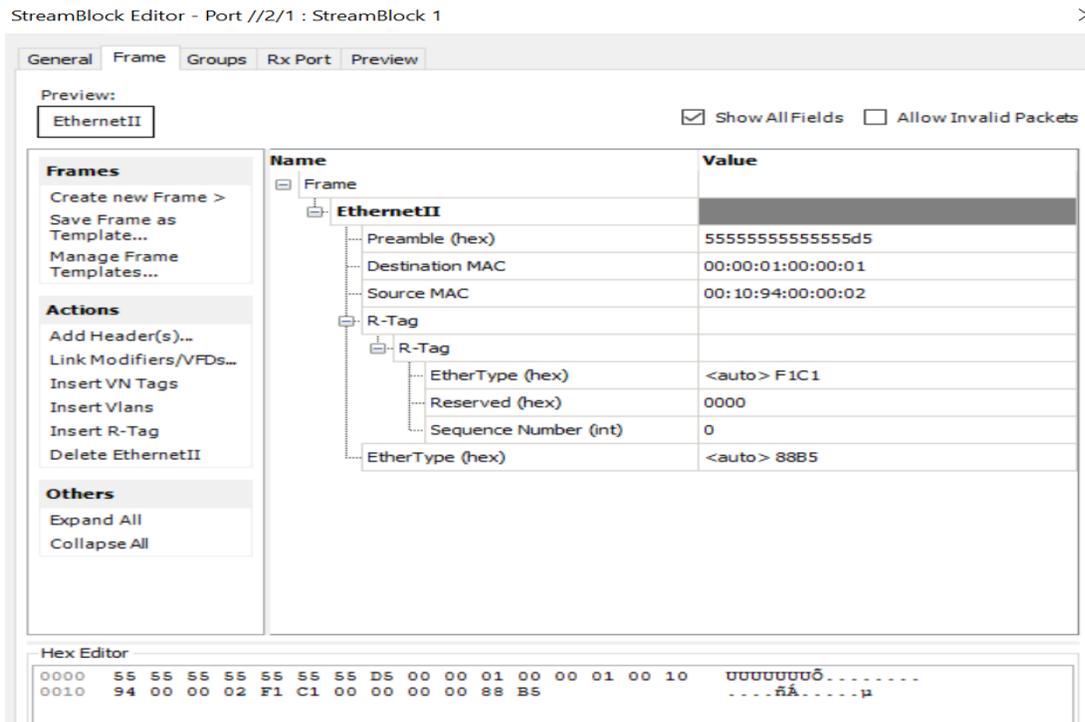
FRER Filter mode support

Frames are being assigned to a certain stream by using a stream identification function. These stream IDs are taking into account some fields in the Ethernet, IP headers or L4 port numbers to categorize the frames that are part of the stream. Spirent TestCenter allows the user to select what stream ID to be used:



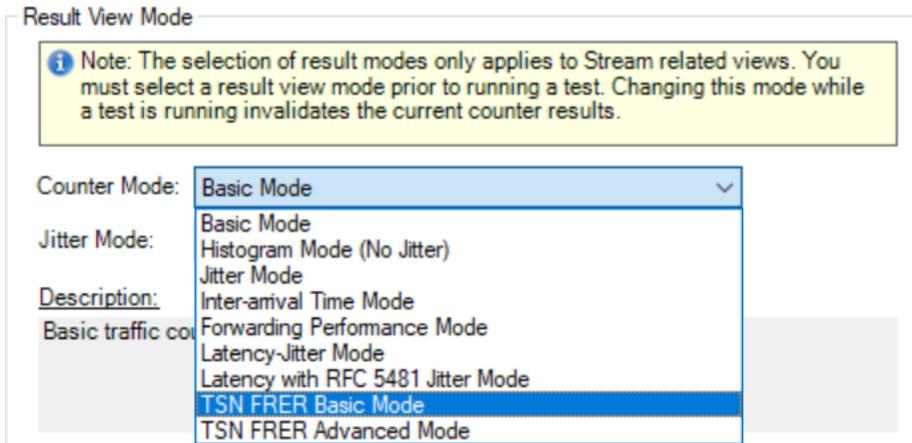
FRER Configuration

To keep track of the sequence numbers, a new header is used: R-Tag (redundancy tag). Stream frame editor has been enhanced to support R-tag configuration:



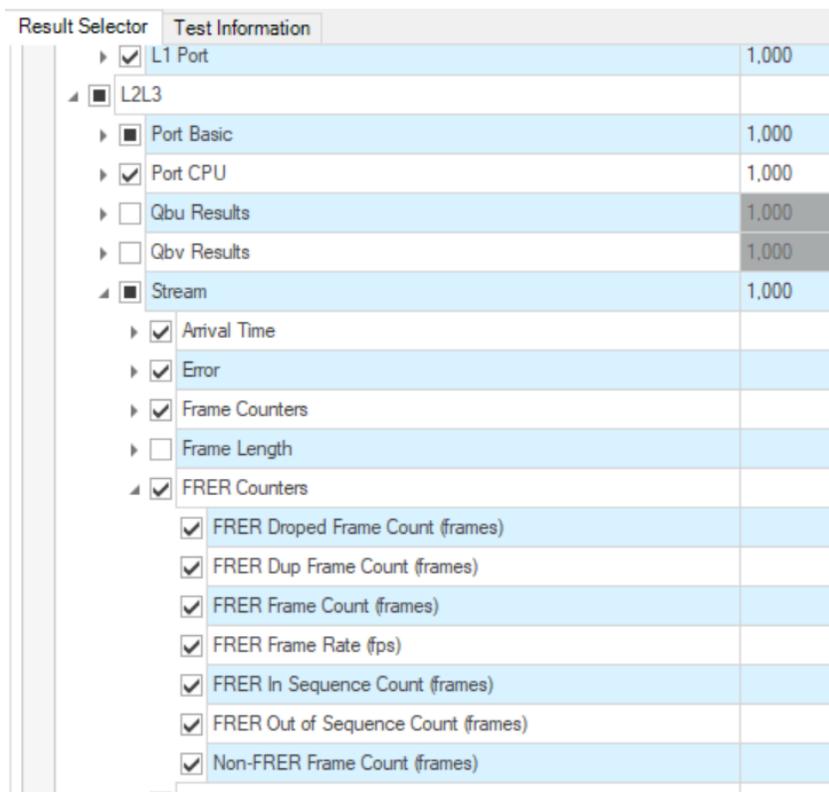
Two new Counter Modes are introduced:

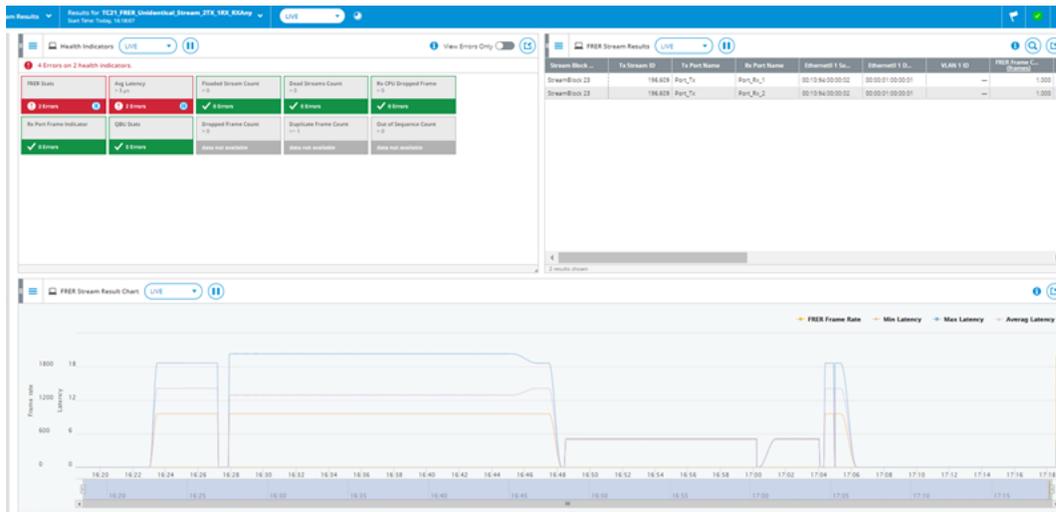
- **TSN FRER Basic Mode:** Used for testing Match Recovery Algorithm. Sequence history length considered is 1 and All latency measurement like Max, Min, Average, Short Term latency is measured.
- **TSN FRER Advanced Mode:** Used for testing Vector Recovery Algorithm. Sequence history length considered is 64 and Only Max latency is measured.



Spirent TestCenter IQ Results:

FRER specific counters have been introduced in the TCIIQ result selector along with TCIIQ profile for FRER results.





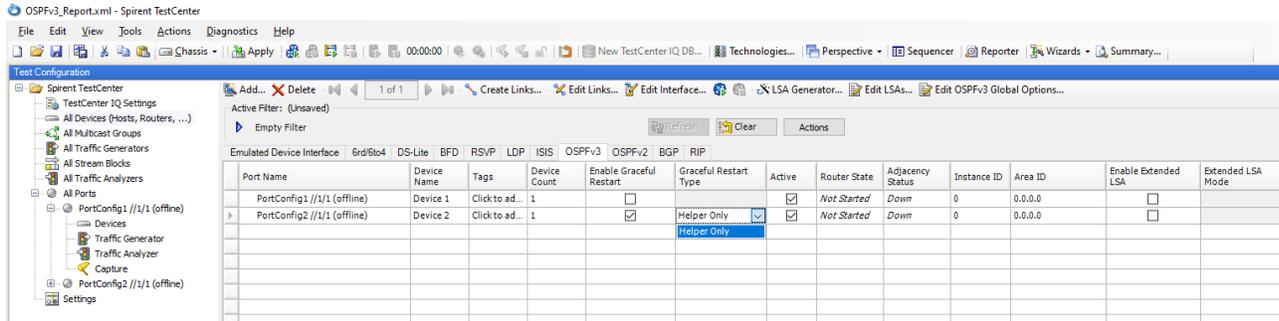
RoCEv2 Storage Fabric Test Solution – 25G

Spirent has launched RoCEv2 storage fabric performance test solution for 25G in Spirent TestCenter Release 5.23 GA. Spirent solution is designed for performance testing of individual switches as well as entire data center networks in RoCEv2 environments, enabling NEMs to bring products to market faster; helping Service Providers and Data Center Providers to rollout applications, network architecture design to production, run vendor selection tests with confidence. This solution is offered as firmware upgrade via licensing on existing best-in-class high-density multi-speed test modules - FX3-QSFP28-6, FX3-QSFP28-4, MX3-QSFP28-4. Users must enable STC-RoCEv2-ECN profile on the module to use this feature. Please refer to the datasheet for more information.

OSPFv3 Graceful Restart – Helper Mode

Spirent TestCenter Release 5.23 GA adds support for a graceful restart helper mode for OSPFv3 protocol emulation. Graceful Restart is a mechanism to restart the control plane of a router, keeping its forwarding plane running with no disruption to the data forwarding in the network during the period of restart operation.

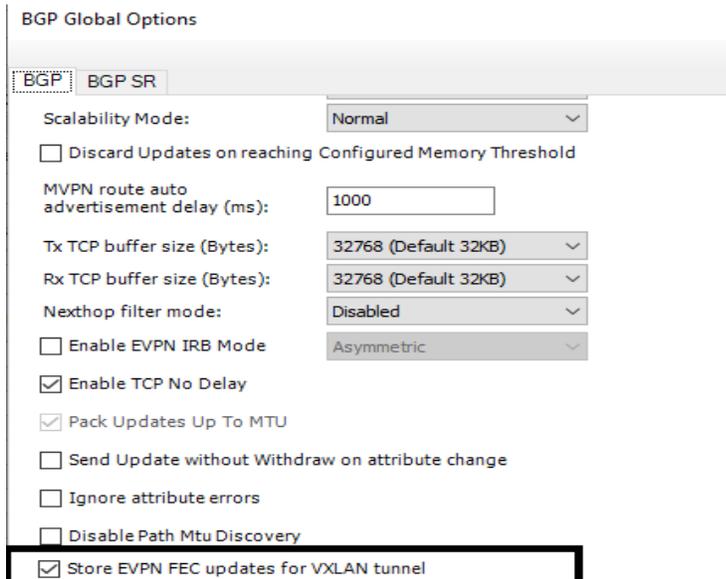
As part of graceful restart procedure, an OSPFv3 router initiates graceful restart and originates grace-LSAs. A grace-LSA is a request sent to the router’s neighbors asking for support in its graceful restart by maintaining adjacency during the specified grace period. The grace-LSA contains the restarting router grace-period and the reason code indicating the reason for the graceful restart. The router which is being restarted and originates the grace LSA is called Restarting Router and the neighbors which cooperate to make the restart graceful are called Helper Routers.



In a test scenario, the DUT will assume the restarting router role while Spirent OSPFv3 emulations will act as helper routers.

Option to store EVPN FEC for VXLAN tunnel

Spirent TestCenter Release 5.23 GA made storing of EVPN FEC for Type-2 and Type-5 routes carrying VXLAN tunnel information inside MPBGP binding table optional. A new option available inside BGP global options. If disabled, the EVPN FEC for VXLAN tunnel will be discarded after routes are processed, and this will save memory space in a scale scenario. The default value of this option is enabled, which will store the FEC information inside BGP binding table, this is existing behavior.



When only control plane is brought up in a EVPN VXLAN Overlay test, this option should be enabled to verify all expected EVPN FEC for VXLAN are received or not. Once VXLAN data plane is configured, the FEC information will be send to VXLAN VTEP emulation from EVPN and stored in VXLAN binding table. User can validate data plane binding using VXLAN View binding option. In a scale scenario, where higher number of routes are received from DUT than expected for VXLAN data plane, this option should be used to save memory and help avoid crashes due to low memory.

Spirent Wi-Fi Hardware and Software Features

C50-KIT-11AX-3E



Spirent TestCenter C50-KIT-11AX-3E appliance in a compact 3U appliance form factor combines Spirent's industry-leading IEEE 802.11ax WLAN tri-band 2.4GHz/5GHz/6GHz interface card (one Wi-Fi NIC) with Spirent IEEE 802.3bz BASE-T 100Mbps/1Gbps/2.5Gbps/5Gbps/10Gbps Ethernet card on a copper interface. Users can emulate large numbers of realistic 802.11 a/b/g/n/ac/ax WLAN clients to connect with an AP via a cabled conductive or over-the-air (OTA) link. Customer can upgrade their existing C50-KIT-11AX-3 appliance to C50-KIT-11AX-3E appliance to extend the test coverage in 6GHz (Wi-Fi 6E) frequency band.

TR-398 i2 Test Suites – Phase 2

Four (4) additional test cases are added to the previously released 6 test cases, bringing a total of 10 test cases (out of 15 total) that are now covered for TR-398 i2 test suites. These are the new test cases:

- 6.3.1: Range Versus Rate Test
- 6.3.2: Spatial consistency test
- 6.4.2: Multiple Association/Disassociation Stability Test
- 6.5.1: Long Term Stability Test

The remaining test cases will be available in future releases.

Note: The TR-398 i2 Test Suites are available on C50-KIT-11AX-1-V2 appliance only and require RF anechoic chamber(s) and accessories in the testbed setup.

Wi-Fi HP 6E Enhancement

Software enhancement for C50-KIT-11AX-8 appliance:

- Encryption and authentication methods: Addition of WPA3-AES-802.1x /EAP-FAST, EAP-ASE-SHA256, CCMP-256 and WPA3-SuiteB-GCMP128/256

RFC 6349 – RTT Discovery (Beta Release)

Round Trip Time (RTT) discovery has been added to RFC6349 in Spirent TestCenter as beta. Refer to the *Notification - Product Alert* section in [Spirent TestCenter Release Notes](#) for more details.

Flow Level ARP Neighbor Detection

This feature enables ARP-ND on each device of learning device block even when “stream only generation” option is not enabled for a stream block on FX3-QSFP28 and MX3-QSFP28 test modules.

Spirent Support

To obtain technical support for Spirent Communications products, please contact our Support Services department using any of the following methods:

Americas

E-mail: support@spirent.com

Web: <https://support.spirent.com>

Toll Free: +1 800-SPIRENT (+1 800-774-7368) (North America)

Phone: +1 818-676-2616

Hours: Monday through Friday, 05:00 to 17:00 Pacific Time

Europe, Middle East, Africa

E-mail: support@spirent.com

Web: <https://support.spirent.com>

Phone: +33 (1) 6137 2270 (France)

Phone: +44 1803 546333 (UK)

Hours: Monday through Thursday, 09:00 to 18:00, 9:00 to 17:00 Friday, Paris Time

Asia Pacific

E-mail: support@spirent.com

Web: <https://support.spirent.com>

Phone: +86 (400) 810-9529 (toll-free mainland China only)

Phone: +86 (10) 8233 0033 (China)

Operating Hours: Monday through Friday, 09:00 to 18:00 Beijing Time

Company Address

Spirent Communications, Inc.
27349 Agoura Road
Calabasas, CA 91301
USA

The latest versions of user manuals, application notes, and software and firmware updates are available on the Spirent Communications Customer Service Center website at <https://support.spirent.com>.

Information about Spirent Communications and its products and services can be found on the company website at <https://www.spirent.com>.

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