Spirent Communications

Spirent TestCenter Software and Hardware New Features 5.21

April 2021

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New Products and Features

Hardware Features

New LAG profiles support added to 4x100G XStream mode

The XStream in 4x100G mode now supports 2x4 and 1x8 LAG profiles.

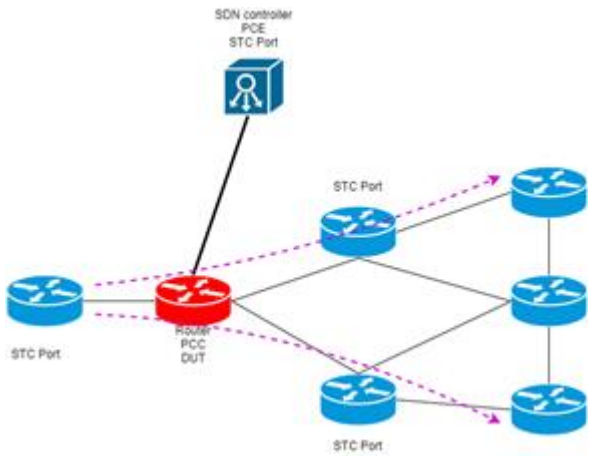
Layer 1 Services support extended to PX3 and DX3 QSFP-DD hardware

Layer 1 Services support is now available on 4x50G mode for PX3(PX3-QSFP-DD-8, PX3-QSFP-DD-4, PX3-QSFP-DD-2), and DX3 (DX3-QSFP-DD-8, DX3-QSFP-DD-4, DX3-QSFP-DD-2) QSFP-DD hardware.

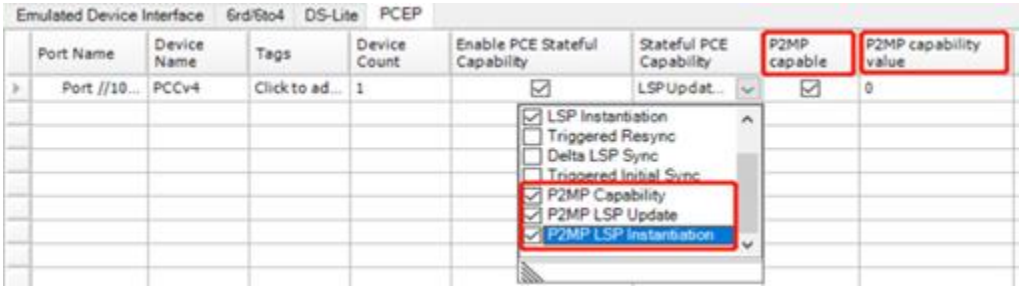
Software Features

PCEP P2MP LSP Extension

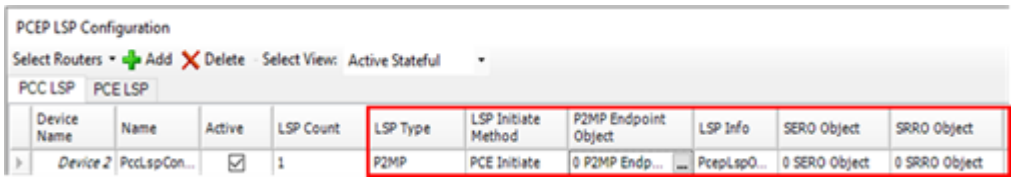
Spirent TestCenter release 5.21 enables Path Computation Element Protocol (PCEP) with Point-to-MultiPoint (P2MP) Traffic Engineering Label Switched Paths (TE LSPs) for use in Multiprotocol Label Switching (MPLS) and Generalized MPLS (GMPLS) networks. Spirent TestCenter can emulate PCE to compute the paths for P2MP TE LSPs and emulate multiple PCC to report or request LSP. In this release, RFC 8623 stateful IPv4 P2MP is supported, IPv6 and PCEP-Error Object will be supported in future releases. License “BPK-1381 PCEP Controller SR P2MP LSP Emulation” must be enabled to activate this feature, wireshark-1.10.3-spirent_180 or later is needed for decoding.



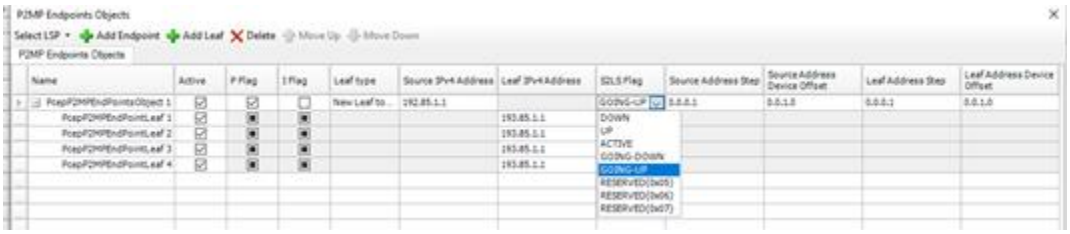
After creating a PCE or PCC emulated device and enabling PCE Stateful Capability, three (3) new items are added under the “Stateful PCE Capability” checkbox. For PCE devices, P2MP capable can be activated and to set P2MP Capability TLV Value.



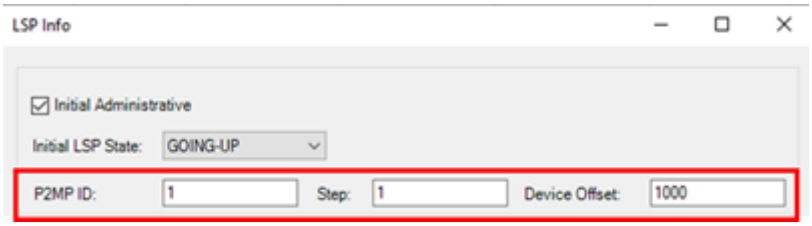
When editing PCEP LSPs, LSP Type can be set as P2MP and then select LSP Initiate Method.



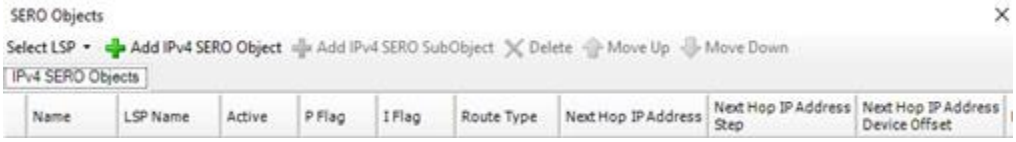
The “P2MP Endpoint Object” column is added and editable. It includes S2LS Flag, Source Address Step, Source Address Device Offset, Leaf Address Step, and Leaf Address Device Offset. Each P2MP Endpoint object should have one source address, one leaf type, one S2LS operational flag, and at least one leaf. Currently, the S2LS object only supports operational flags, and it is only carried by Report message.



In the LSP Info screen, P2MP ID, Step, and Device Offset are configurable.

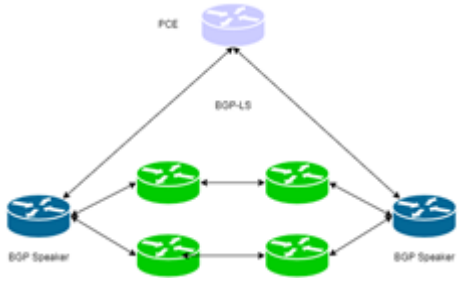


SERO and SRRO are used to add Secondary ERO Object and Secondary RRO Object, which are used to represent P2MP intended path and the actual path. SERO is carried by Report, Update, and Initiation message, and it is enabled for PCC and PCE P2MP LSP. SRRO can be carried by Report message only, and it is only enabled for PCC P2MP LSP.



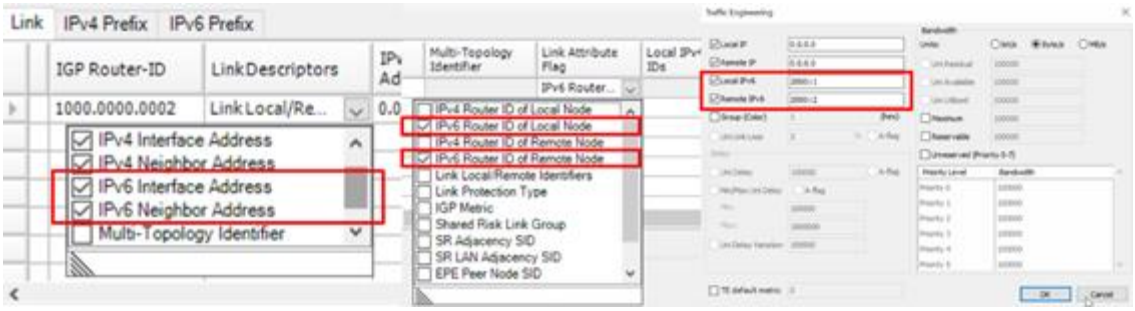
BGP LS for IPv6

BGP can be used by PCE to collect link-state and TE information from BGP speaker in NLRI. Spirent TestCenter release 5.21 enables IPv6 for BGP LS. It includes BGP-LS for OSPFv3 w/o SR topology, ISIS w/o SR with MSD, and BGP EPE.

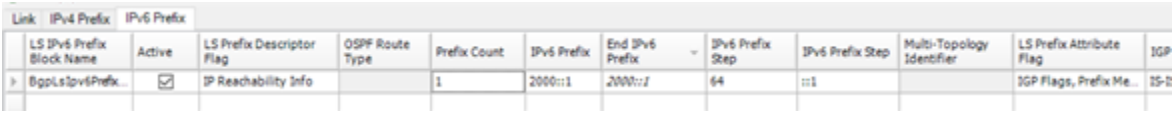


In the BGP Link-State node view, users can select the protocol type and input the router ID in the Local IPv6 Router IDs column.

In the BGP LS view, IPv6 Interface/ Neighbor Address, IPv6 Local/Remote Node, and Traffic Engineering configuration all support IPv6.



In the new added IPv6 Prefix tab, all basic prefix attributes, segment routing attributes, and custom attributes are available.

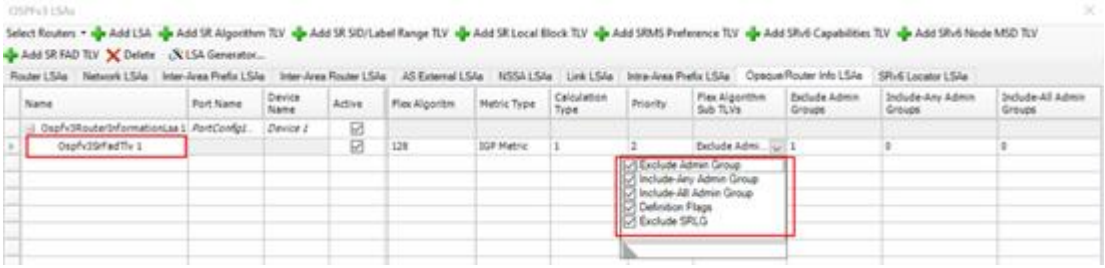


All new added information can be decoded by wireshark-1.10.3-spirent_180 or later.

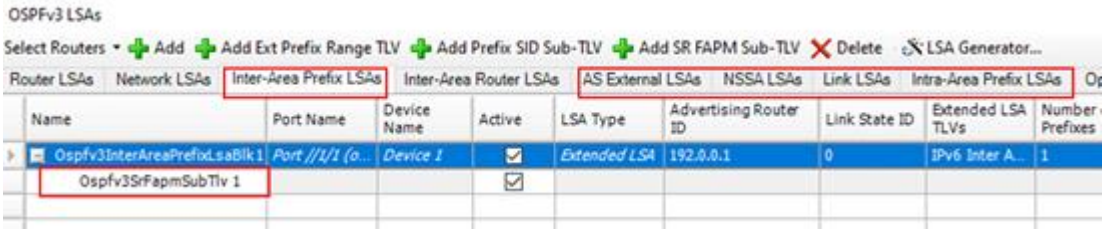
SR Flex Algo for OSPFv3

This feature is used to configure Segment Routing (SR) related information in OSPFv3 protocol, including SR Flexible Algorithm Definition (FAD) TLV and SR Flexible Algorithm Prefix Metric (FAPM) Sub-TLV.

SR FAD TLV can be added in the Opaque/Router-Info LSA tab, and it has five (5) sub-TLVs as shown in the screen capture.



SR FAPM Sub-TLV can be added in Intra-Area Prefix TLV (tab Intra-Area Prefix LSAs and Link LSAs), Inter-Area Prefix TLV (tab Inter-Area Prefix LSAs), and External Prefix TLV (tab AS External LSAs and NSSA LSAs).



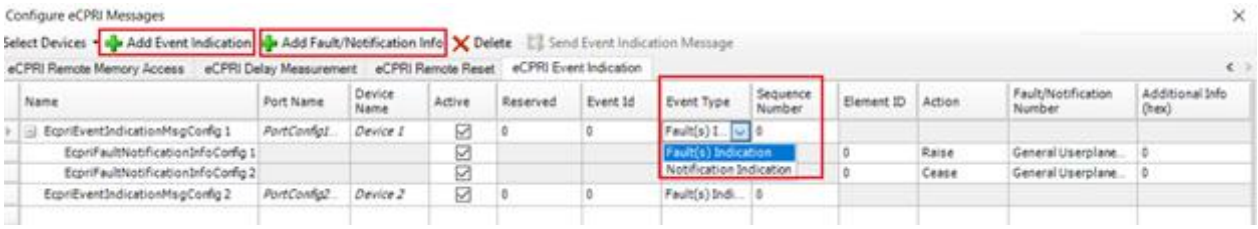
All new added information can be decoded by wireshark-1.10.3-spirent_180 or later.

eCPRI Event Indication Message Phase 1

Event Indication eCPRI message is used when either side of the protocol indicates to the other end that an event has occurred. An Event is generally a raised fault/notification. Fault needs ack, notification does not require ack. In Spirent TestCenter release 5.21, both fault and notification indications are supported and can emulate sending and receiving of event indication messages.

In the eCRPI Event Indication tab, events can be added:

- One Event Indication can either contain one or more faults, or one or more notifications.
- Users can add event indication messages and multiple faults/notifications in a single message as in the example shown below:

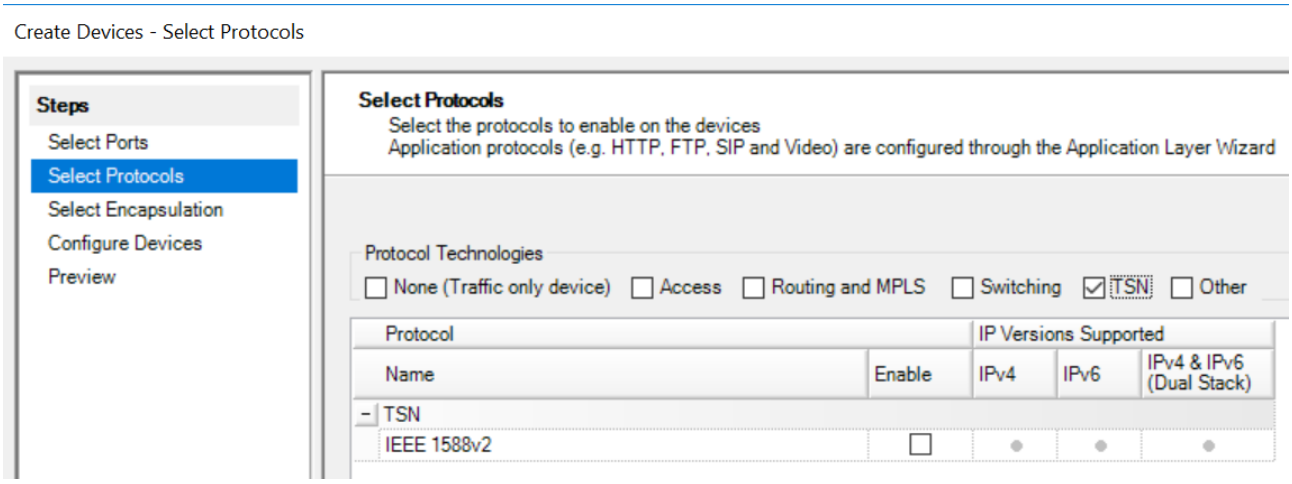


Spirent TestCenter IQ will display the number of Event Indication Messages sent and received by category.

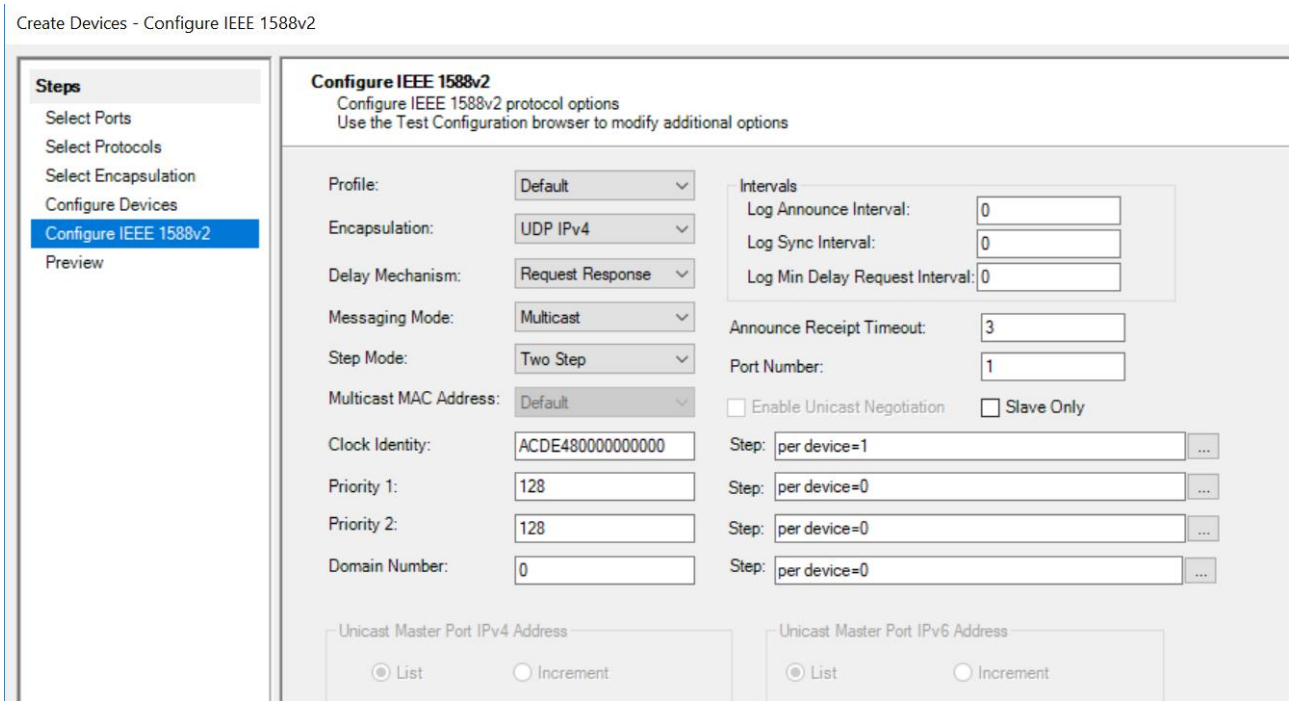
PTP Device Wizard Support

This feature improves usability in high-scale scenarios involving PTP protocol. Users can create a scale PTP configuration using the wizard with ease, without worrying about the parameter distribution across devices and the ports. The PTP device wizard allows users to select protocol, configure upper layer and lower protocols, configure the number of devices, VLANs, and MAC and IP addresses, all in single flow. The PTP Configuration page allows users to configure protocol specific parameters such as encapsulation, delay mechanism, messaging mode, intervals, clock ID, priority values, domain number, etc. It supports incrementing parameters across the devices and across the ports from the given start and step value.

- PTP protocol can be selected under the TSN Category



- All of the PTP parameters are available for users to configure.



QBv TX Support Added

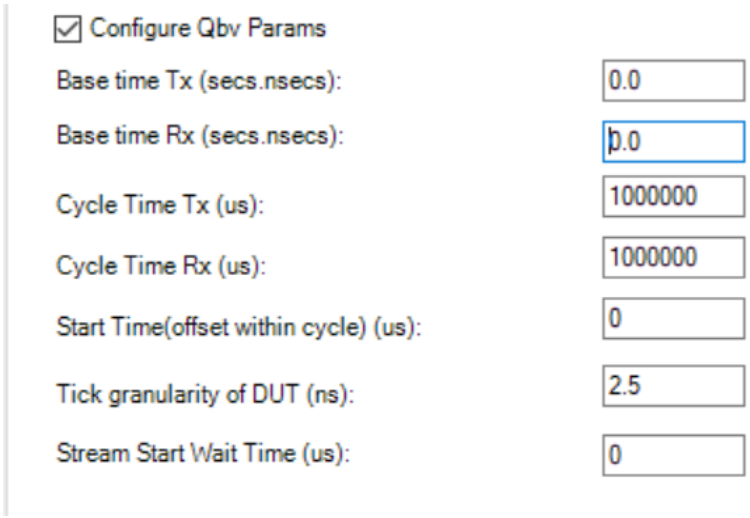
- Qbv Tx support for 2.5G & 5G speeds on Spirent FX2/MX2 1G/10G load modules and NIC-47.
- Qbv Tx support for 100M speed on Spirent FX2 1G load modules and NIC-65.

The QBv Tx feature provides a way to schedule the transmissions of frames based on the timing derived from 802.1AS. The frames are assigned to queues based on Quality-of-Service (QoS) priority.

This feature enables creating Traffic Profiles.

- Traffic queues/flows for up to 8 priorities
- Schedule the traffic based on specified time intervals
- Insert gPTP timestamp at time of transmission

QBv Parameters configuration:



IPv4 Next Hop for IPv6 Route on BGP

Spirent TestCenter Release 5.21 enables users to configure BGP IPv6 unicast routes with IPv4 Next Hop value. Previously, only IPv6 Next Hop Values were supported for BGP IPv6 unicast routes.

Next Hop Addr Type	Next Hop	IPv4 Next Hop	Next Hop Increment Per Router
IPv4		192.0.0.1	0.0.0.1
IPv6	::ffff:192.85.1.3		

Support for Communities in BGP Route Import

In Spirent TestCenter Release 5.21, users can import the community values from the route file using the BGP Route Table Import wizard. The Route file should be imported in Juniper® route file format to use the benefits of this feature.

RFC 6349 - Benchmarking Methodology for TCP Throughput Testing

RFC 6349 is a methodology used to measure end-to-end TCP throughput in a managed IP network. It provides accurate TCP throughput measurement and a practical test approach that specifies tunable parameters such as link speed, RTT (Round-Trip Time), MTU (Maximum Transmission Unit), and Socket Buffer sizes. It can be used to determine how these factors affect TCP performance over an IP network.

RFC 6349 is provided under a new license and is dependent on the Spirent TestCenter Enhanced Layer 4-7 license (BPK-2001) which must be purchased separately.

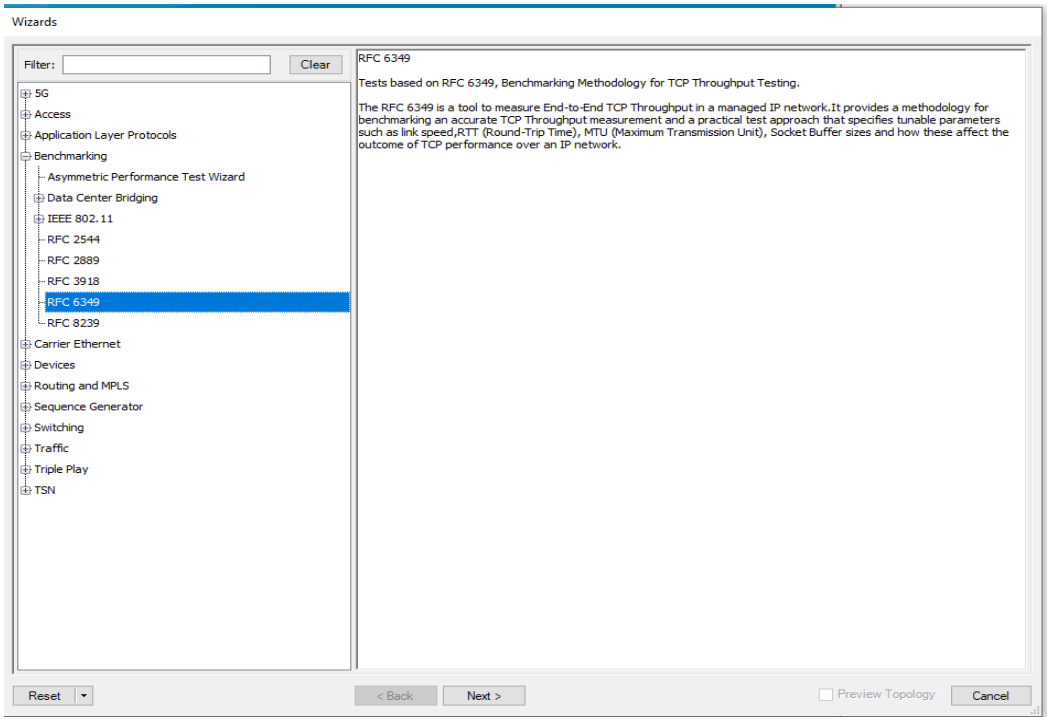
The wizard builds a sequence of test loops that utilize the Enhanced L47 Raw TCP protocol for traffic generation. The wizard configures an outer loop with multiple iterations: client-to-server traffic (Tx only), server-to-client traffic (Rx only) and bidirectional traffic (Tx+Rx). In each of these outer loop iterations, there is an inner loop which exercises different TCP receive window size configurations based on a percentage of the Minimum (Ideal) TCP receive window size (called Minimum RWIND). The calculation is explained in RFC 6349 section 3.3.1. The inner loop iterates over these different Minimum RWIND sizes, executes the tests, and gathers statistics to present in the result.

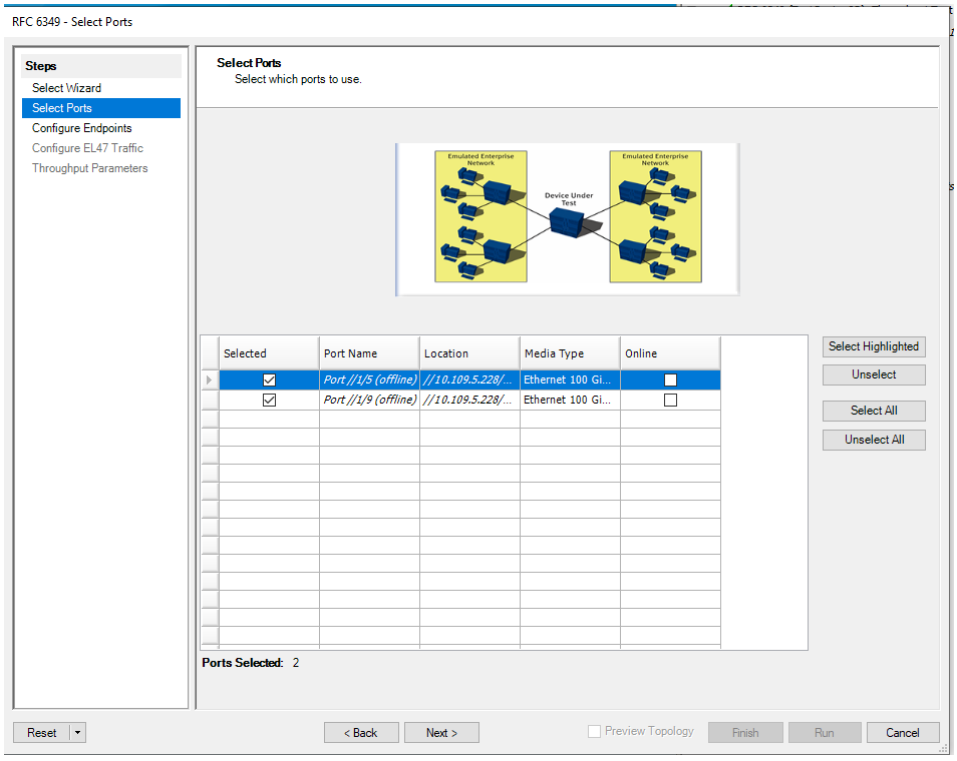
An example of the resulting test iterations is shown in the table.

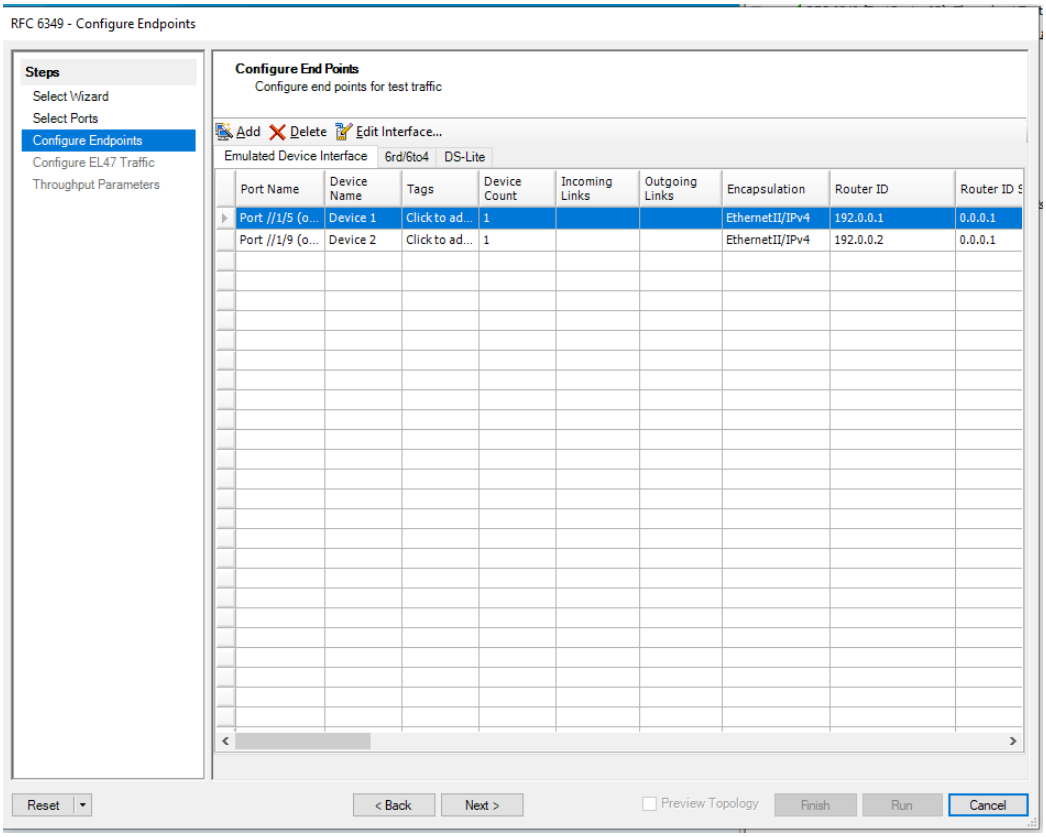
Iteration	Traffic Direction	%Min RWIND Size
Iteration 1	Tx Only	25%
Iteration 2	Tx Only	50%
Iteration 3	Tx Only	75%
Iteration 4	Tx Only	100%
Iteration 5	Tx Only	125%
Iteration 6	Rx Only	25%
Iteration 7	Rx Only	50%
Iteration 8	Rx Only	75%
Iteration 9	Rx Only	100%
Iteration 10	Rx Only	125%
Iteration 11	Tx+Rx	25%
Iteration 12	Tx+Rx	50%
Iteration 13	Tx+Rx	75%
Iteration 14	Tx+Rx	100%
Iteration 15	Tx+Rx	125%

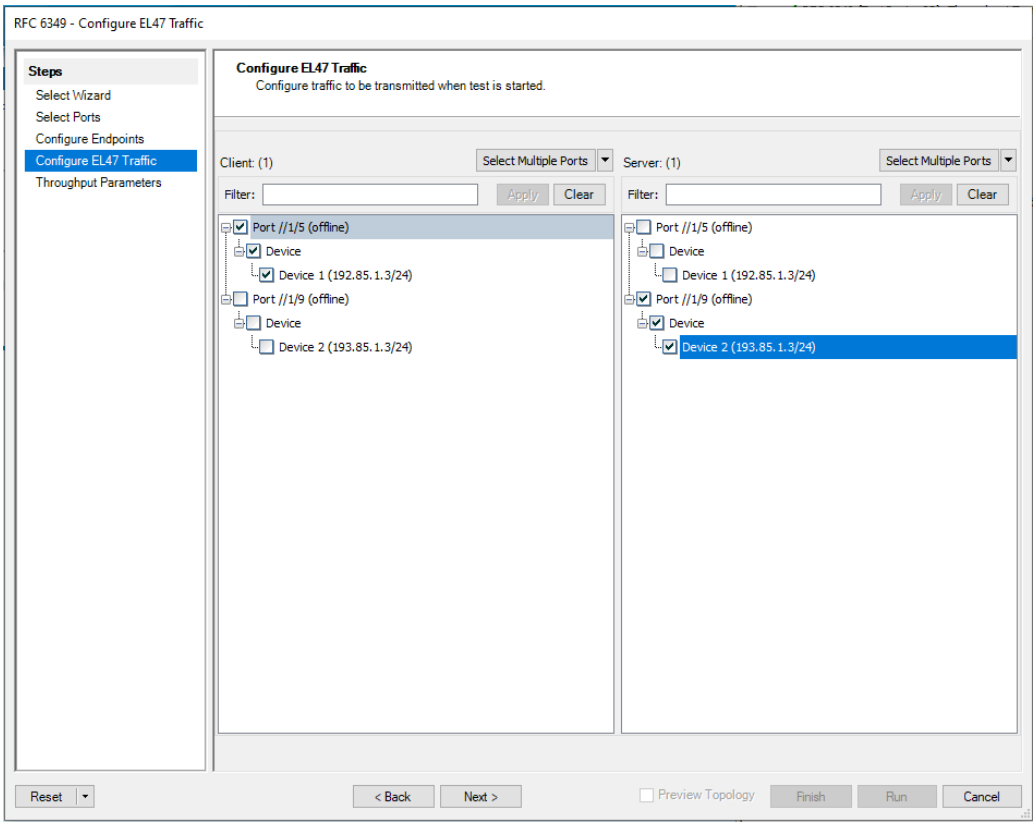
RFC 6349 is implemented as a new Spirent TestCenter wizard accessed from the Wizards menu. The new wizard adopts a broadly similar workflow to the other Spirent TestCenter benchmarking methodology wizards such as RFC 2544 and RFC 8239.

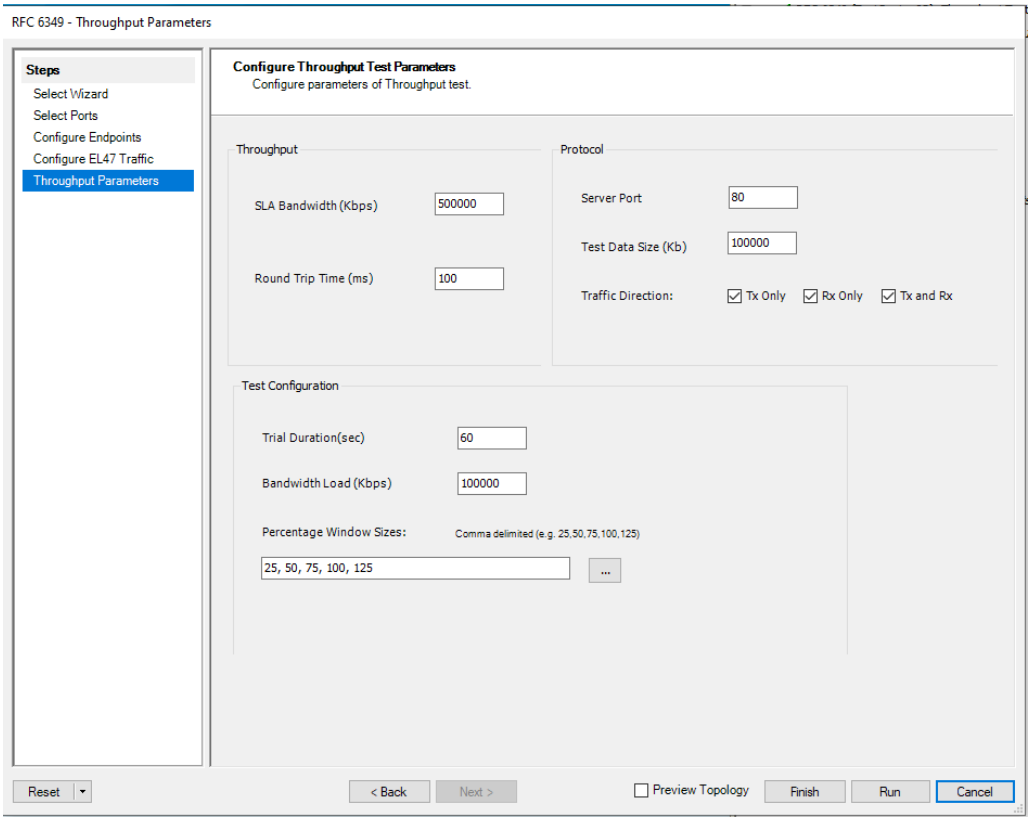
The wizard guides the user through the necessary steps to configure and run the test. Steps include port selection, endpoint configuration (IP addresses etc.), endpoint selection, and throughput parameter configuration, as shown in the following sequence of screen captures.



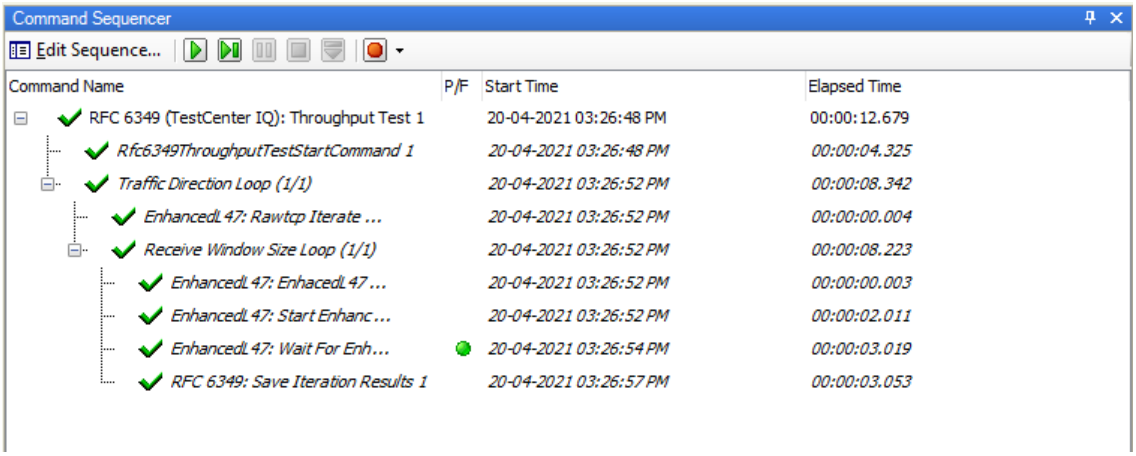



RFC 6349 - Configure Endpoints
Steps
Select Wizard
Select Ports
Configure Endpoints
Configure EL47 Traffic
Throughput Parameters
Configure End Points
Configure end points for test traffic
Add
Delete
Edit Interface...
Emulated Device Interface
6rd/6to4
DS-Lite
Port Name
Device Name
Tags
Device Count
Incoming Links
Outgoing Links
Encapsulation
Router ID
Router ID S
Port //1/5 (o...
Device 1
Click to ad...
1
EthernetII/IPv4
192.0.0.1
0.0.0.1
Port //1/9 (o...
Device 2
Click to ad...
1
EthernetII/IPv4
192.0.0.2
0.0.0.1
Reset
< Back
Next >
Preview Topology
Finish
Run
Cancel

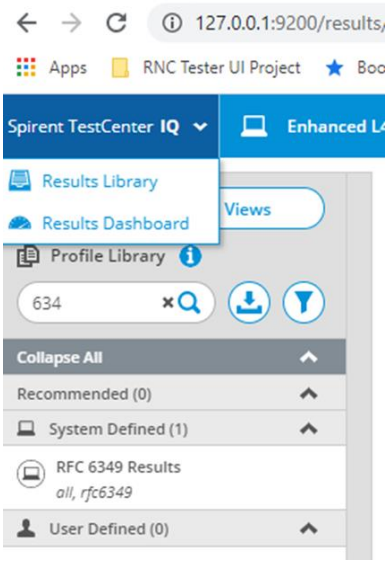

RFC 6349 - Configure EL47 Traffic
Steps
Select Wizard
Select Ports
Configure Endpoints
Configure EL47 Traffic
Throughput Parameters
Configure EL47 Traffic
Configure traffic to be transmitted when test is started.
Client: (1)
Select Multiple Ports
Filter:
Apply
Clear
Port //1/5 (offline)
Device
Device 1 (192.85.1.3/24)
Port //1/9 (offline)
Device
Device 2 (193.85.1.3/24)
Server: (1)
Select Multiple Ports
Filter:
Apply
Clear
Port //1/5 (offline)
Device
Device 1 (192.85.1.3/24)
Port //1/9 (offline)
Device
Device 2 (193.85.1.3/24)
Reset
< Back
Next >
Preview Topology
Finish
Run
Cancel

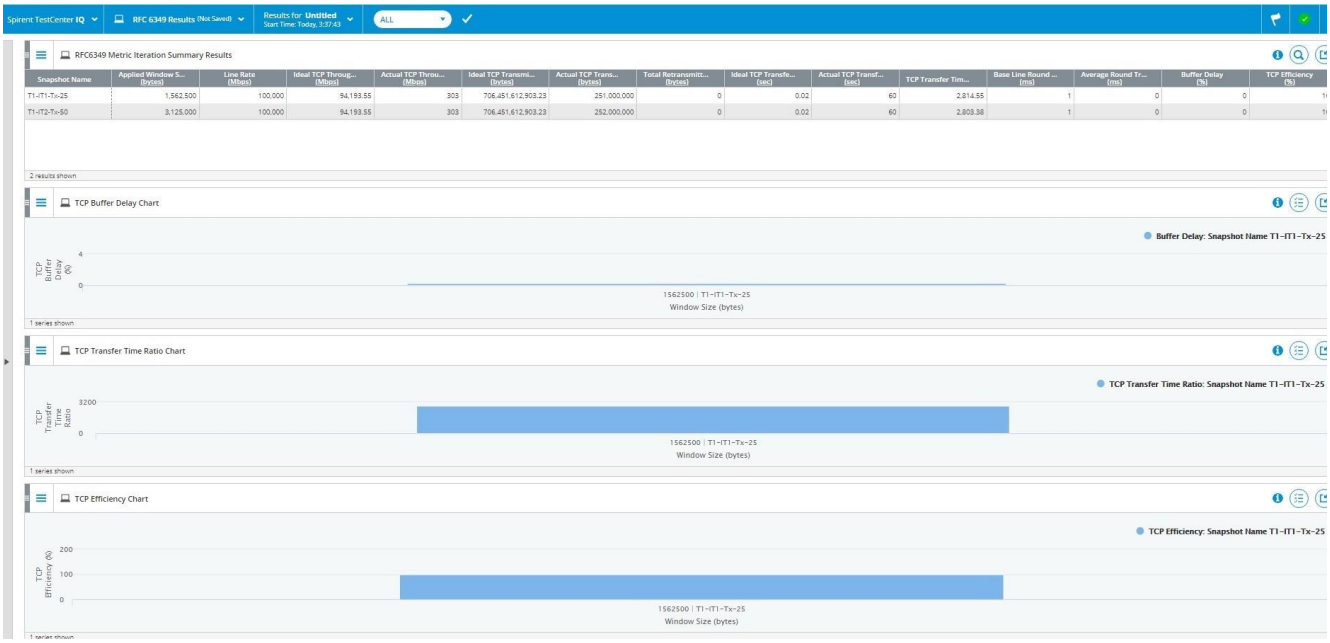


The wizard configures the Spirent TestCenter Command Sequencer to run the traffic direction and receive window loops as described above. The screen capture below shows how the command sequencer window can be used to display test progress.



Results are displayed using Spirent TestCenter IQ by selecting the RFC 6349 Results profile.





Spirent Support

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

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E-mail: support@spirent.com
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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.