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New Products and Features

Hardware Features

Support for 100G NRZ on Spirent DX3-QSFP-DD-8 and PX3-QSFP-DD-8 Appliances

Spirent TestCenter 400G appliances DX3-QSFP-DD-8 and PX3-QSFP-DD-8 now support the NRZ support at 100G speed. This feature is beta for release 5.15. To use this feature, the 400G system must support the 100G speed option. The licenses to enable this feature are HWO-DX3-QSFP-DD-8-NRZ100G and HWO-PX3-QSFP-DD-8-NRZ100G.

Software Features

HLTAPI Support for RFC 8239 Line-Rate Test

The RFC 8239 Test Package is an essential tool for Data Center Networks, it provides a methodology for benchmarking data center physical network equipment DUTs, including congestion scenarios, switch buffer analysis, microburst, and head-of-line blocking, while also using a wide mix of traffic conditions.

Spirent TestCenter release 5.15 adds HLTAPI support for the Line-Rate Test, one of five tests defined in RFC 8239. RFC 8239 results are only available in Spirent TestCenter IQ, users must have JSON and REST packages in the TCL installed folder to use this function.

TCL example:
The following example creates a Line-Rate test:

```
set line_rate_cfg [sth::test_rfc8239_config \n      -mode create\n      -test_type lr \n      -streamblock_handle streamblock1 \n      -endpoint_creation 0 \n      -latency_type FIFO \n      -start_traffic_delay 3 \n      -stagger_start_delay 4 \n      -delay_after_transmission 30 \n      -enable_learning 1 \n      -learning_mode 12 \n      -learning_frequency learn_every_trial \n      -learning_rate 2000 \n      -12_delay_before_learning 4 \n      -12_learning_repeat_count 8 \n      -12_fixed_frame_size 256 \n      -12_learning_frame_size_mode fixed \n      -enable_traffic_verification true \n```
-traffic_verification_freq_mode verify_every_trial \\
-traffic_verification_abort_on_fail true \\
-traffic_verification_tx_frame_count 200 \\
-traffic_verification_tx_frame_rate 2000 \\
-iteration_count 2 \\
-test_duration_mode bursts \\
-test_duration_bursts 1300 \\
-streamblock_frame_sizes false \\
-frame_size_mode custom \\
-frame_size "64 512" \\
-load_unit percent_line_rate \\
-load_type custom \\
-load_list "10 30" ]

Sample Output:

{status 1} {handle rfc8239linerateconfig2}

The following example modifies a created test:

sth::test_rfc8239_config -mode modify \\
-handle [keylget line_rateCfg handle] \\
-test_type lr \\
-learning_rate 1200 \\
-12_delay_before_learning 6 \\
-12_learning_repeat_count 4 \\
-12_fixed_frame_size 512 \\

Sample Output:

{status 1}
**O-RAN Mantissa Mode Enhancement**

Spirent TestCenter release 5.15 added support to give users the option to select among 9, 12, 14 and 16-bit Mantissa mode (IQ width) for compressing the IQ samples with a block floating point algorithm. Previously, Spirent TestCenter only supported 9-bit Mantissa mode. Users can also choose between the “Block Floating Point” compression method and “No Compression.” When “Compression Method” is set to “No Compression”, Spirent TestCenter automatically sets “Mantissa Mode” to 16-bit and block floating point compression will not be applied to IQ samples.

**Spirent TestCenter Virtual – Azure DPDK Support**

Spirent TestCenter Virtual release 5.15 introduces high-performance traffic generation in Azure deployments via DPDK support. Spirent TestCenter Virtual is available as a VHD image that can be deployed on Microsoft® Azure™ cloud. DPDK supports our customers’ needs for high performance traffic generation and analysis in public clouds. For detailed set up and configuration information refer to Spirent TestCenter Virtual Azure Quick Start Guide.
Wi-Fi Rate vs Range Enhancement: TCP Traffic & Report with Spirent TestCenter IQ

The wizard-based Wi-Fi Rate vs Range (RvR) testing with various 802.11ax gears is enhanced in this release with these important features:

- TCP traffic support: RvR with TCP traffic from either enhanced L4-7 or ALP
- The new RvR Result Report generation with Spirent TestCenter IQ

To run RvR testing, a traffic profile must be selected first, to set up the internal channel attenuation for an automated testing iteration over attenuation levels. With the new TCP traffic support, the RvR feature can provide both UDP and TCP testing results. TCP traffic can be selected from various types from either Enhanced L4-7 or ALP. When Enhanced L4-7 is selected, the traffic type can any application layer traffic supported in Enhanced L4-7.

The Wizard-based GUI for configuring RvR is shown in the following screen captures.
The supported Spirent TestCenter WLAN gears are listed below, along with the required RvR license part numbers. Note that these licenses are currently available. No new license is added. This new enhancement on RvR does not require a new license.

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>C50-KIT-11AX-1-V2</td>
<td>C50 W/ 4-PORT 10G/5G/2.5G/1G/100M Copper, 802.11ax Wi-Fi NICs, 2.4GHz/5GHz, Internal Attenuation, DFS Radar Signal Emulation, HW Timing</td>
</tr>
<tr>
<td>C50-KIT-11AX-3</td>
<td>C50 4-Port 10G/5G/2.5G/1G/100M Copper, One 802.11AX Wi-Fi NIC, 2.4GHz/5GHZ, Internal Attenuation and HW Timing</td>
</tr>
<tr>
<td>MX2-11AX-2-V2</td>
<td>MX2 Test Module with 802.11ax Wi-Fi, 2.4GHz/5GHz, Internal Attenuation, DFS Radar Signal Emulation, and Hardware Timing</td>
</tr>
<tr>
<td>AP-C2-KIT-11AX-1</td>
<td>C2 4-Port 10G/5G/2.5G/1G/100M Copper, One 802.11AX Wi-Fi NIC, 2.4GHZ/5GHZ, Internal Attenuation and HW Timing</td>
</tr>
<tr>
<td></td>
<td>C50 4-Port 10G/5G/2.5G/1G/100M Copper, 802.11AX Wi-Fi NICs for 20 OFDMA/MU Clients, 2x2 MIMO, 2.4GHz/5GHz, and HW Timing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RvR License Part Number</th>
<th>Description</th>
<th>Platform</th>
</tr>
</thead>
<tbody>
<tr>
<td>BPK-5002</td>
<td>Wi-Fi Rate vs Range FOR SPIRENT TESTCENTER</td>
<td>MX2 Test Module</td>
</tr>
<tr>
<td>C50-BPK-5002</td>
<td>Wi-Fi Rate vs Range FOR SPIRENT TESTCENTER C50</td>
<td>C50</td>
</tr>
<tr>
<td>AP-BPK-5002</td>
<td>Wi-Fi Rate vs Range FOR SPIRENT TESTCENTER C2</td>
<td>C2</td>
</tr>
</tbody>
</table>
**DHCPv6 Protocol Events**

In Spirent TestCenter Release 5.15, events for DHCPv6 protocol are supported and can be viewed in Spirent TestCenter IQ. These events are useful for troubleshooting any test involving DHCPv6 Client or Server emulation. For DHCPv6 protocol, the available events are described below.

**DHCPv6 Up and Down events** are generated when the protocol state changes to Bound or Not Started.

**DHCPv6 Command events** are generated when a user invokes commands to trigger changes in behavior during the test.

**DHCPv6 Error events** are generated when any unexpected error occurred during the test. This could be due to a malformed packet or an unsupported protocol attribute received from the DUT.

**DHCPv6 Timer events** are generated when any protocol timer expires during the test.
**L2TP Protocol Events**

In Spirent TestCenter Release 5.15, L2TP protocol events are supported and can be viewed in Spirent TestCenter IQ. L2TP events help troubleshoot any test involving L2TPv2/v3 emulation. For L2TPv2/v3 protocol, the available events are described below.

L2TP Up and Down events are generated when LAC or LNS state changes to Connected or Idle.

L2TP Command events are generated when user invoke commands to trigger changes in protocol behavior during the test.

L2TP Error events are generated when any unexpected error occurred during test. This could be due to authentication mismatch, a malformed packet, or an unsupported protocol attribute received from the DUT.

L2TP Timer events are generated when any of the tunnel retry timers or session response timers expire during the test.
OSPFW2/v3 Segment Routing Events

In Spirent TestCenter Release 5.15, OSPFW2/v3 SR (Segment Routing) events are supported and can be viewed Spirent TestCenter IQ. OSPFW2/v3 SR events are added support to OSPFW2/v3 events and together provide help troubleshooting for any test involving OSPFW2/v3 SR. For OSPFW2/v3 SR, specific error events are available as shown below.

OSPFW2/v3 Command events are generated when a user invokes commands to trigger changes in protocol behavior during the test.

OSPFW2/v3 SR Error events are generated when any unexpected error occurred during test. This could be due to authentication mismatch, a malformed packet, or an unsupported protocol attribute received from the DUT.
Protocol Event Details

Spirent TestCenter Release 5.15 includes enhancements to protocol events detail view of Errors and Warnings. In the current release, this feature support has been extended to many other protocols and services such as OSPFv2, OSPFv3, OSPFv2/v3 SR, LDP, and Access protocols. Some examples are shown below.

OSPFv2 Error Details:

- **OSPFv2 Error Details:**
  - Event Name: OSPFv2 Error
  - Time Stamp: 2020-10-30 14:39:45.919
  - Severity: Error
  - Message: Master Flag Missing
  - Error Detail: Insufficient Master Flag Present... 2020-10-30 14:39:45.919
  - Source: Database Description Packet
  - Neighbor Router ID: 192.0.0.1
  - LS Type: Link ID

OSPFv3 Error Details:

- **OSPFv3 Error Details:**
  - Event Name: OSPFv3 Error
  - Time Stamp: 2020-10-30 14:39:45.919
  - Severity: Error
  - Message: Master Flag Missing
  - Error Detail: Insufficient Master Flag Present... 2020-10-30 14:39:45.919
  - Source: Database Description Packet
  - Neighbor Router ID: 192.0.0.1
  - LS Type: Link ID

LDP Error Details:

- **LDP Error Details:**
  - Event Name: LDP Error
  - Time Stamp: 2020-10-30 14:39:45.919
  - Severity: Error
  - Message: Master Flag Missing
  - Error Detail: Insufficient Master Flag Present... 2020-10-30 14:39:45.919
  - Source: Database Description Packet
  - Neighbor Router ID: 192.0.0.1
  - LS Type: Link ID
**DUT Events Integration via Proprietary MIBs**

In release 5.13, Spirent TestCenter IQ introduced a robust DUT Events feature that allows users to view certain events from DUT/SUT, in conjunction with events from Spirent hardware & software. Users can get GUI notification via special alert icons and Event Dashboard views. TestCenter IQ added an SNMP trap collector that can receive SNMP traps from DUTs and convert them into Events that can be shown in TestCenter IQ tables and graphs. These events can be displayed on the dashboard, sorted, correlated, plotted on graphs, and filtered, as with Spirent generated events.

Spirent TestCenter release 5.15 extends this feature to allow users to create events from their own proprietary MIBs. Users can define specific traps from their MIBs that can generate an Event. Upon receiving those traps, TestCenter IQ generates appropriate events that can be viewed and manipulated using standard IQ event controls.

A complete list of supported MIBs and traps is available at [DOC12030](https://www.spirent.com/customer-service-center) on the Spirent Customer Service Center (CSC) website.
Enhanced L4-7: Video Support Implementation - (Phase-1)

A 2-arm video test is now supported with an emulated ABR-based video client and server pair. Select the protocol by dragging Adaptive Bitrate Video from the Protocols pane into the Traffic Mix pane.

You can edit parameters (using the pencil icon) from the list of protocols on the right-hand side of the Traffic Mix pane.

Configure the server and client parameters in the editor dialog as shown below.

In this first phase, HTTP Live Streaming (HLS), sometimes known as Apple video, is supported.
**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](mailto:support@spirent.com)
- **Web:** [https://support.spirent.com](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](mailto:support@spirent.com)
- **Web:** [https://support.spirent.com](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](mailto:support@spirent.com)
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- **Phone:** +86 (400) 810-9529 (toll-free mainland China only)
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- **Operating Hours:** Monday through Friday, 09:00 to 18:00 Beijing Time

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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](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](https://www.spirent.com).

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