Solutions overview

The Spirent dX2 test module series combines 40GbE and 10GbE functionality in multiple speed form-factors to provide the highest density and most cost-effective solution for testing high-performance Top of Rack (ToR), End of Row (EoR), and high-scale switch and router fabrics. Modern switch and router fabrics span multiple chassis and can be expanded to build systems supporting hundreds or thousands of ports.

The Spirent dX2 series is capable of fully loading those systems to maximum bandwidth capacity. Combining Spirent’s Cloud Core enabled hardware architecture with the Spirent TestCenter software platform, dX2 modules enable traffic scaling to more than 22 terabits in a single rack. With Spirent’s advanced setup wizards and Intelligent Results, test engineers can quickly assess fabric performance and reliability at full load before deploying large mission-critical environments where failure could impact millions of users.

The Spirent dX2 module comes in dual-speed 40GbE/10GbE, 40GbE only and 10 GbE only versions and is fully compatible with the industry-leading Layer 2-7 traffic generation and deep analysis capabilities of the Spirent fX2 and mX and dX HyperMetrics modules. A solution combining Spirent dX2 modules, other Spirent modules, and Spirent’s virtual test ports delivers unparalleled possibilities for designing the highest capacity and most flexible test beds at a cost-effective price point.

Applications

- **Data center ToR and EoR switches and fabrics**—Validate forwarding performance, latency, MAC capacity and functional capabilities of ultra high-scale, next-generation SPB and TRILL enabled multi-terabit cloud data center fabrics
- **Terabit routers**—Emulate ISIS, OSPF and BGP- validate IP throughput and multicast performance by emulating hundreds of thousands of clients. Understand system architecture efficiency, performance, and reliability
- **Subscriber access gateways**—Emulate millions of access subscribers using different services over many ports under realistic full load traffic conditions
- **Device benchmarking**—Benchmark devices using IETF RFC 2544, RFC 2889 and RFC 3918 methodologies with easy test setup that uses dynamically bound traffic setup by automated wizards
- **Power efficiency**—Evaluate real power usage and efficiency of router and switch blades and fabrics at low and full capacity load
Features & Benefits

- When scaling to tests with hundreds or thousands of test ports, several challenges arise. Configuring those ports and analyzing the data produced can be a formidable task. Spirent has been the industry leader in large scale testing for the last decade by architecting software and hardware that is built to scale.

- Dual-speed modules support 40 GbE and 10 GbE operation from each port adding flexibility and cost savings for users needing high density test solutions at multiple port speeds.

- Multiple interface speed and port-density versions to choose from to match your test application, budget and scale.

- Up to 8 simultaneous users per module optimizes port utilization.

- Protocol emulation support for all key fabric and access protocols including: ISIS, OSPF, BGP, MPLS, LACP, xSTP, IGMP, MLD, SPB, TRILL, FCoE, FIP, DCBX and 1588.

- The highest density 40GbE and 10GbE solution optimizes lab space and minimizes power consumption. Supports up to 144 40 GbE or 576 10 GbE ports per 11U chassis.

- Supports the advanced Spirent test signature for full compatibility with the complete line of Spirent test modules. This provides a solution enabling full backplane traffic loading with many dX2 modules transmitting traffic to be analyzed with the advanced deep analysis capabilities of the Spirent mX, fX2 and HyperMetrics modules.

- Full compatibility with Spirent TestCenter Virtual—enabling high-density testing throughout the physical and virtual data center infrastructure.

- Available test packages and integrated configuration wizards simplify and accelerate configuration of multiterabit traffic patterns across hundreds or thousands of ports.

Productivity

- Intelligent Results™
  - High-scale test beds produce an overwhelming amount of data. The dX2’s results are incorporated into Spirent’s advanced and highly efficient distributed database that processes billions of real-time results to validate tests and identify problems, giving engineers the immediate feedback they need to debug problems and accelerate development.

  - Spirent TestCenter delivers more results with tighter correlation to find obscure bugs quickly. A single test run with Spirent provides more coverage and information where multiple runs are necessary with other test tools.

  - Interesting Streams uses real-time results data mining to dynamically filter through mountains of data and display the results that matter.

- Simplify automation with a built in graphical Command Sequencer and GUI to Script.

Visual Programming Empowers the Test Operator to:

- Construct sophisticated, stressful, automated test cases without programming experience.

- Combine numerous individual test cases into a single run to save regression test time.

- Develop a catalog of broad automated test cases in a fraction of the time.

- Export automated test cases to run from a command line for headless test execution that can be integrated with any automated regression system.

Requirements

- SPT-N11U or SPT-N4U Chassis and Controller.

- Windows-based workstation with 10/100/1000 Mbps Ethernet NIC; mouse and color monitor required for GUI operation.

- Linux or Windows-based workstation for Tcl and other API automation.

- For complete GUI requirements, please refer to Spirent TestCenter Packet Generator and Analyzer Base Package A data sheet (P/N 79-000028).

- Minimum required base package BPK-1001A for packet generation and analysis.
Spirent dX2
High Density 40GbE and 10GbE Test Modules

<table>
<thead>
<tr>
<th>Technical specifications</th>
<th>dX2 40/100GbE dual speed module</th>
<th>dX2 40GbE module</th>
<th>dX2 10GbE module</th>
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<tbody>
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<td>Ports per module</td>
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Supported interface media
- 40GBASE-SR4 (QSFP+)
- 40 GbE Copper Direct Attached (QSFP+), 40GBASE-CR4 Auto Negotiation supported on 24-port modules and rev. B 8-port modules
- 10GBASE-SR (QSFP+ to 4 x 10GbE breakout)
- 10GBASE-LR (QSFP+ to 4 x 10GbE breakout)
- 10GbE Copper Direct Attached Cable (QSFP+ to 4 x 10GbE SFP+ breakout)

Operational modes
- LAN, with DIC support
- Common Tx clock Synchronization to chassis-based source, adjustable by+ 100 ppm; optionally synchronized to PTP, GPS, CDMA, or master chassis timing source for intra-chassis synchronization
- Highly accurate chassis-to-chassis synchronization for large-scale test bed latency and RFC bechmarking

User reservations
- Per QSFP+ port (standard-density module), per three QSFP+ ports (high-density module)

Layer 2/3 Generator and Analyzer
- 8191 transmit and 8191 trackable receive streams; stream fields can be varied to create billions of flows
- Port based (rate per port), stream based (rate per stream), burst, timed
- 60 to 16,004
- One packet per 3.43 seconds to 101% of line rate
- Change rate and frame length settings without stopping the generator or analyzer for truly interactive, cause and effect analysis
- Tx and Rx frame counts and rates
- Out of sequence errors
- FCS errors and rate
- Min, Max and Average Latency (2048 streams)
- Tx and Rx frame counts and rates
- Out of sequence errors
- PRBS errors
- FCS errors and rate
- Layer 2: Ethernet II, 802.1Q, 802.1ad, FCoE
- Layer 3/4: IPv4, IPv6, TDP, UDP
- Fully compatible with Spirent hardware; contains sequence number and highly accurate timestamp
Spirent dX2
High Density 40GbE and 10GbE Test Modules

About Spirent Communications

Spirent Communications (LSE: SPT) is a global leader with deep expertise and decades of experience in testing, assurance, analytics and security, serving developers, service providers, and enterprise networks.

We help bring clarity to increasingly complex technological and business challenges.

Spirent’s customers have made a promise to their customers to deliver superior performance. Spirent assures that those promises are fulfilled.

For more information, visit: www.spirent.com

Ordering Information

Due to the wide range of available system configurations, please contact your regional Spirent sales representative for detailed ordering information.

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