

# Spirent **TestCenter™** Platforms

Trusted partner for verifying the network and cloud evolution

“Verifying high-speed, high-capacity router performance is not easy. Spirent’s high port density and simple GUI provided the results necessary to verify the features and performance of the router.”  
—Mr. Jin, Senior Engineer, LG U+

# Spirent TestCenter

**Trusted Performance**—Spirent has been a leader for network testing for over 20 years. That experience is embedded in our industry-leading hardware and software platforms which have been proven over multiple generations of network technologies.

**Unparalleled Flexibility**—Whether you are using the highest density chassis-based platform, the more mobile appliances, or our software-based virtual systems, all Spirent TestCenter platforms can interoperate and cooperate in a single test—allowing you to tailor the test infrastructure to deliver optimal results without breaking your budget.

**Industry Leadership**—Service providers, NEMs and enterprises wishing to keep pace with the latest technologies use Spirent TestCenter as their end-to-end testing solution from traditional performance testing to detailed tests of virtualization, cloud, mobile backhaul and high-speed Ethernet.

## Modules



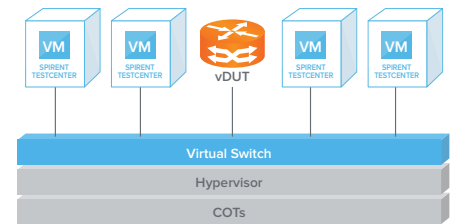
Spirent’s flexible chassis-based solution offers the highest scale, deepest functionality, most cost-effective solution for testing Ethernet and Wi-Fi products from 10M to 400G.

## Appliances



Spirent TestCenter appliances offer the power of Spirent’s L2-7 router, switch, application, security, and Wi-Fi test solutions in a portable or bench-top form factor.

## Virtual



Spirent’s Virtual solution delivers a unified testing architecture that ensures full compatibility with any Spirent TestCenter interface and enables porting of prior investment in test cases for physical to virtual.

## Spirent Ethernet Solutions

- **400G/200G/100G/50G:** Spirent is leading the industry toward higher density and throughput. Our 400G/200G/100G/50G test solutions are designed to validate the next wave of even higher speed Ethernet solutions supporting CFP8, OSFP, and QSFP-DD interfaces.
- **100G/50G/40G/25G/10G:** Spirent offers the industry’s first quint-speed HSE test modules. With industry leading highest density 12 port test module high scale and performance versions supporting all key form factors QSFP28, CFP2, CFP4 and CPAK for packet generation and analysis.
- **40G/10G:** Spirent test modules and appliances combine 40G and 10G functionality in multiple speed form-factors to provide the highest density and most cost-effective solution for testing next generation datacenter multi-terabit fabrics.
- **10G/1G:** Spirent dual-speed test modules and appliances reduce the total cost of ownership for testing network devices and deployments by combining network emulation and application traffic capabilities with industry-leading Layer 2-3 traffic generation and analysis.
- **10G/5G/2.5G/1G/100M:** Spirent quint-speed test modules support 16 RJ45 ports, and Spirent appliances support 4 RJ45 ports to address IEEE 802.3bz and latest generation BASE-T specifications. Spirent also offers 2 and 4 pair PoE support for BASE-T.

# Spirent Test Modules & Chassis

## Spirent N11U Chassis

The Spirent N11U chassis is the next generation in chassis architecture, designed to handle complex multiprotocol scale and cloud virtualization testing needs. It simultaneously scales to the highest port counts and test traffic rates in the industry while incorporating innovative time- and money-saving capabilities such as: built-in touchscreen administration, intelligent power and fan control, and fast booting and system firmware upgrades.

With its efficient architecture, the SPT-N11U supports a variety of environments from multi-user functional testing all the way up to multi-chassis switch fabric and core-router stress testing. A single chassis can scale to nearly 15 terabits of data traffic - more than double that of the competition - supporting enough protocol scale to push any modern router architecture beyond its limits. It offers best-in-class timing precision and synchronization for largescale tests and site to-site latency/jitter measurements, with the precision of synchronization being ten times better than the nearest competition.



## Spirent N4U Chassis

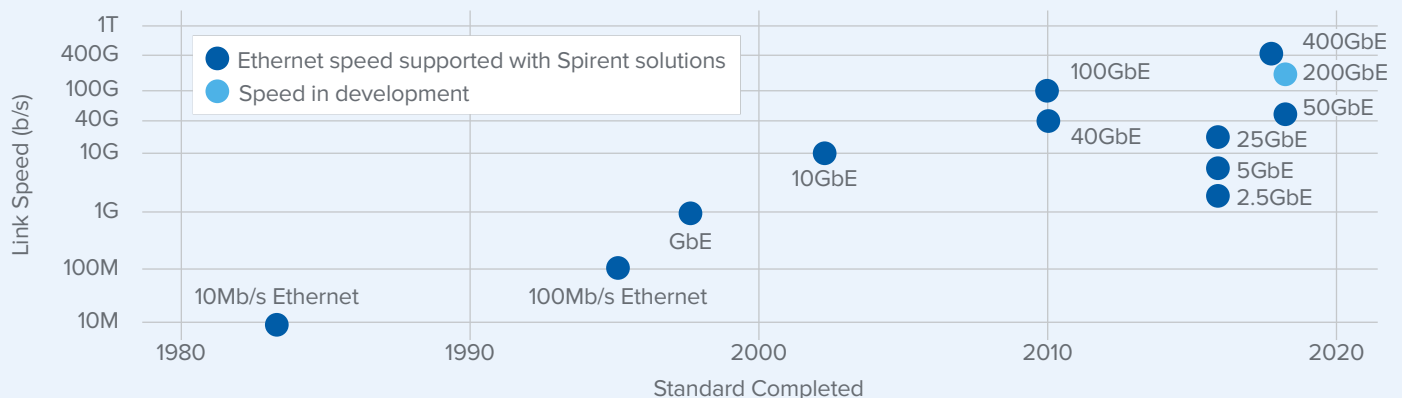
The Spirent N4U is the next-generation compact chassis, supporting a variety of environments where testing requires equipment to be relocated.

It supports multi-user functional testing and chassis chaining where higher density is required but a mainframe N11U is not available. It is fully interoperable with the N11U and accepts the same test modules with no modifications.

The SPT-N4U is the smallest modular chassis form factor that supports Spirent's speeds from 100M to 400GbE test modules. By optimizing the design with the latest hardware and software technology, the SPT-N4U lowers the cost of testing the devices and networks powering the always-on data network.



Evolution of Ethernet





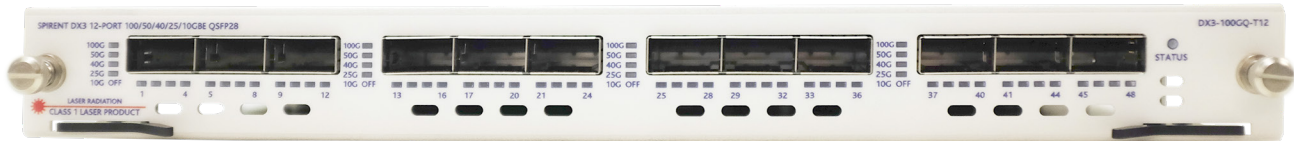
# High Speed Ethernet— Be ready for the future

Ethernet speeds are increasing. Networks are becoming more intelligent. Topologies are scaling to sizes never seen before. Spirent's Ethernet portfolio allows you to quickly and confidently launch products and services dependent on the emerging cost-effective, high-speed and high density 400/200/100/50/40/25/10G technologies.

## DX3—Data Density

Spirent dX3 modules offer the industry's most cost effective and highest density test solution. These modules are designed to validate the quality of services delivered on the next-generation of multi-speed and cloud-scaled data center fabrics and service provider routers.

DX3-100GQ-T12

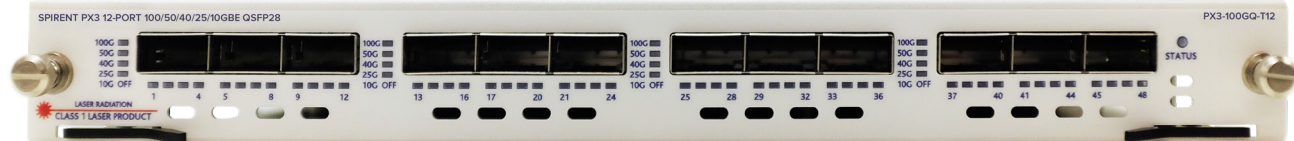


Terabit Routers | Data Center ToR and EoR Switches & Fabrics

## PX3—System Validation

Spirent pX3 modules combine the data density of the dX3 platform with the protocol scale of the mX3 platform to create the ideal test solution for high scale system validation of large switch or router networks. These modules are employed when system testing of data center fabrics and service provider routers move beyond traffic to scale the number of emulated neighbors, subscribers, VMs or similar network entities.

PX3-100GQ-T2



SP Core-Edge Routers | High-Scale Terabit Routers | Carrier Ethernet | High Capacity | Multiservice Routers | Data Center ToR, Spine & Core Switches

## FX3—Flexible Functionality

Spirent fX3 quint-speed test modules combine Spirent's industry-leading Layer 2–3 traffic generation and analysis with powerful network emulation and application layer protocols for emulating a wide range of device types, users and protocols. Delivering the highest performance per dollar for Layer 2–7 testing, they are ideal for functional and performance testing of data center and service provider network infrastructure.

FX3-100GQ-T2

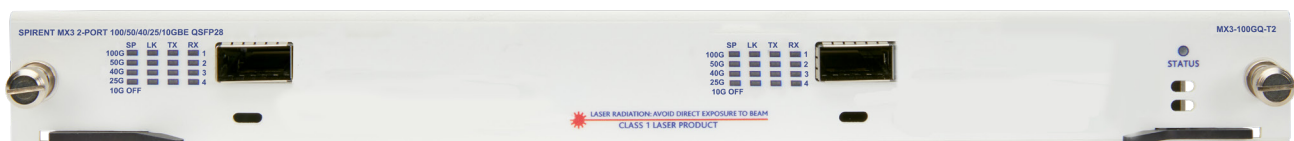


Service Provider Edge-Core Routers | Carrier Ethernet | Data Center ToR, Spine & Core Switches

## MX3—Multiprotocol Performance

Spirent mX3 modules are ideal for performance testing of data center and service provider network infrastructure where extreme protocol performance is required. They are targeted for testing multi-terabit routers and high-scale cloud infrastructure, ensuring dataplane QoS with high performance traffic and verifying the scalability of routing, access, application, and security protocols.

MX3-100GQ-T2



Service Provider Core-Edge Routers | High-Scale Terabit Routers | Carrier Ethernet | High Capacity Multiservice Routers | Data Center ToR, Spine & Core Switches

# Spirent Appliances

“

Spirent's test equipment enabled the validation and demonstration of these benefits at a large scale.

—R.K. Anand, EVP & GM – Juniper Networks

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The C1 is a cost-effective entry-level test system that allows companies of all sizes and budgets to leverage the industry-leading Spirent TestCenter platform.

The C50 delivers the highest performance per dollar for Layer 2–7 testing in a compact 3U appliance form factor and can be used in a benchtop lab environment or in traditional test lab environment.



Spirent C1



Spirent C50

## Ethernet



- Multiple speed form-factors available for 40G/10G, 10G/1G, and 10G/5G/2.5G/1G/100M
- Full chassis chaining and external timing sync available via direct connect, NTP, PTP, GPS, and CDMA
- SDN and data center: Validate forwarding performance and functional capabilities of SDN
- Device benchmarking: Test using IETF RFC 2544, RFC 2889 and RFC 3918
- Core/edge routers & switches: Verify scale, reliability, performance of Layer 2 & 3 services
- Carrier Ethernet: Verify scale, reliability, performance of Ethernet services
- Subscriber emulation: Verify setup & teardown of thousands of access subscribers

## Wireless LAN



- WLAN Multi-client emulation: Emulate multiple and realism clients for 802.11 a/b/g/n/ac modes
- 802.11ac Wave-2 validation: MU-MIMO performance testing
- WLAN security verification: Complete pack for AP Personal and Enterprise security (802.1x) type
- RFC-style QoS testing: Benchmarking for maximum client loading, UDP traffic throughput, TCP goodput, and rate vs range
- Typical WLAN features support: 802.11 k/v/r based fast roaming, DFS, and WMM

## Automotive



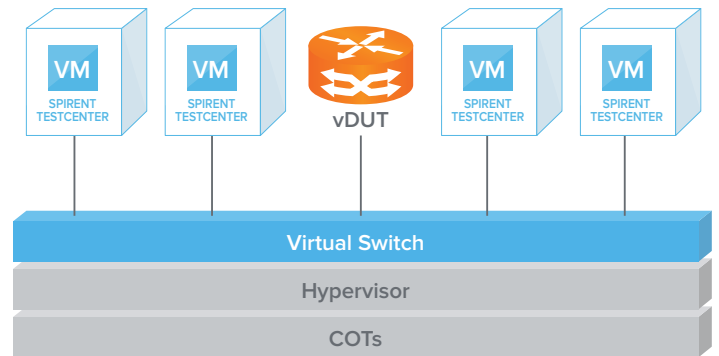
- R&D testing: Technology feasibility studies and performance modeling
- Device and protocol functional testing
- Conformance and certification testing
- Device, sub-system, or services performance characterization and availability
- Stress testing requiring higher device and traffic emulation scaling capability as well as higher physical interface connection
- Device benchmarking: Test using IETF RFC 2544, RFC 2889 and RFC 3918 methodologies
- Security and vulnerability testing: Emulate attacks and malware, fuzzing



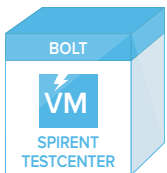
# Spirent Virtual Platform

Spirent's Virtual solutions allow users to leverage all the investment made over the years in testing carrier-grade network functions that is now being ported over to virtualized infrastructure.

Spirent TestCenter™ Virtual is the industry-leading solution that optimizes the performance and scale of new cloud-enabled network services. Whether you are driven by innovations like SDN/NFV or looking to accelerate your DevOps cycles, Spirent Virtual enables users to validate Layer 2–7 with testing topologies that run on both control plane and data plane ensuring performance, scalability and resiliency.



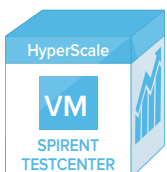
**Virtualized Regression**—Virtualize, automate regression test beds with extensive support of all protocols, wizards, and APIs of Spirent TestCenter hardware. Alleviate the burden of creating new test cases by being 100% compatible with existing test cases.



**Performance, Throughput**—Achieve up to 40GB @2048 frame sizes and 25GB @1024 frame sizes respectively, with the same footprint and functionality as Spirent TestCenter Virtual. DPDK and SR-IOV are required for this high throughput solution.



**Containers**—Industry's first containerized testing solution with full control plane functionality. It allows users to benchmark container networking or embedded traffic generation with file formats readily available in Linux Container (LXC) and Docker.



**HyperScale**—Scale-by-design solution for orchestrating large testbeds with scalable architecture. It spans up to a million test ports, delivering end-to-end testing capabilities of a multi-tenant cloud datacenter based on ESXi, KVM, OpenStack, etc.



**Cloud Platforms**—Spirent Virtual solution enables users to consume Cloud platforms of their choice, allowing for validation of DUTs on leading hypervisors and cloud platforms such as OpenStack, VMware vCloud, Cloudstack, Amazon Web Services, etc.

# Spirent Software Platform



Layer 2-7 test solutions provide maximum test coverage with 100% flexible and portable test cases from hardware to virtual. The test environment can be customized to meet the unique needs of each tester—ultimately leading to higher quality products and services brought more quickly to market.

Spirent TestCenter's sophisticated user interface framework is designed to improve the tester's efficiency and effectiveness

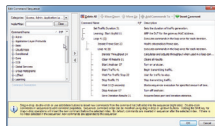
Automate Spirent TestCenter using popular languages such as Tcl, Perl and Python, or with advanced tools such as Spirent iTest, Velocity or TTworkbench

Benchmark and validate traffic and protocol performance quickly and easily using methodology-driven testing

## Windows Application



## Automation



## Methodology-Driven Web Applications



Spirent TestCenter API is a powerful interface for implementing custom test cases in a regression environment, accelerating test case development and increasing team productivity

## Common API & REST API

Spirent Test Center's REST API offers flexibility to test and accelerate your innovation with any scripting or programming language, any OS, and either 32- or 64-bit hardware

# Spirent TestCenter™

HARDWARE

← PLATFORM →

VIRTUAL

## Automate Your Test Environment

### The Smarter Way to Test

Spirent Test Center enables users to customize the test environment to their unique needs, leading to higher quality products and services brought to market faster.



Whether users are developing scripts in Tcl, Perl, or Python for a complex regression environment, or focusing on script re-use and portability across platforms and teams, or simply wanting to speed up some repetitive manual tasks without programming, Spirent TestCenter offers multiple ways to automate in a diverse array of environments.

Spirent TestCenter integrates easily with Spirent iTest, Spirent Velocity, or TTworbench for test creation and orchestration.

#### About Spirent

At Spirent Communications we help the world communicate and collaborate faster, better and more often. The world's leading communications companies rely on Spirent to help design, develop and deliver world-class network, devices and services. Spirent's lab test solutions are used to evaluate performance of the latest technologies. As new communication services and applications are introduced in the market, Spirent provides tools for service management and field test to improve troubleshooting and quality. Spirent also enables enterprises, institutions and government agencies to secure and manage their networks.

From wireline to wireless to satellite, Spirent offers a complete portfolio of solutions to enhance customer Quality of Experience.

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