



Spirent TestCenter

Packet Generator and Analyzer Base Package

Product Overview

The Packet Generator and Analyzer Base Package is a Spirent TestCenter System component that helps network equipment manufacturers, service providers and large enterprises quickly evaluate and troubleshoot the data plane functionality and scalability of switching and routing devices and networks.

This product helps users address the challenge of improving their products' quality, even as product complexity increases and time-to-market shrinks, by identifying more problems faster than ever before possible. The Packet Generator and Analyzer Base Package combines broad technology support, such as VLANs, QoS, dual-stack IPv4/IPv6 and flexible jumbo frames, with advanced diagnostic capabilities into a single environment that supports functional and performance testing.

Because it is an integrated component of Spirent TestCenter, this package can work together with other TestCenter components to deliver easy, consistent Tcl support for all key metropolitan and enterprise protocols, including spanning tree, VLAN, DHCP, QoS, multicast, IPv4/IPv6 and routing. TestCenter includes RFC-based benchmarking methodologies for Layer 2 and Layer 3. Each TestCenter module supports multiple users and hot swapping.

Applications

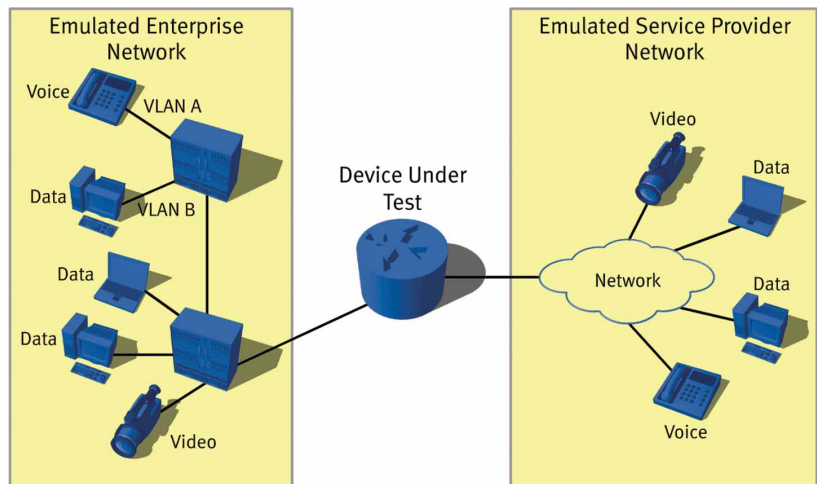
Since the Packet Generator and Analyzer Base Package emulates the flow of Ethernet-encapsulated traffic across a device or network, it can be used to evaluate the stability of switches and routers under static or dynamic traffic load conditions for minutes, hours, and days. When used in conjunction with any of TestCenter's additional protocol packages, it can emulate complex network topologies and traffic conditions.

TestCenter customers can use this package to evaluate key performance parameters such as per-flow QoS, fail-over time or Access Control List (ACL) filtering performance. As new network functionality is developed or evaluated for deployment, they can characterize and troubleshoot functional behavior, including negative

testing. The package can also perform comparative analysis of devices or services with deterministic traffic during product development cycles or vendor comparisons.

Benefits

- The Packet Generator and Analyzer Base Package enables users to quickly assess and report product and service quality by uncovering difficult functional issues such as error handling, forwarding table behavior, fail-over performance, protocol encapsulation/decapsulation, IPv6 transitional algorithms, QoS scheduling, bandwidth shaping and access control list filtering using a variety of tools
- Emulate traffic originating from network devices or hosts with the ability to use a stream editor to create unique encapsulations or protocol headers



GET IT DONE FASTER WITH

Spirent TestCenter

- Wire rate traffic generation and analysis
- 10 Megabit to 10 Gigabit
- Generates up to 32,767 streams per port
- Analyzes up to 65,535 streams per port
- Integrated performance and functional test modes
- Dual stack IPv4 and IPv6
- Mix L2, L3, Unicast, Multicast, QoS and routing traffic
- Real-time results
- Easy, full-featured Tcl automation
- Multi-user and hot-swappable interface modules

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Analyze | Assure | Accelerate™

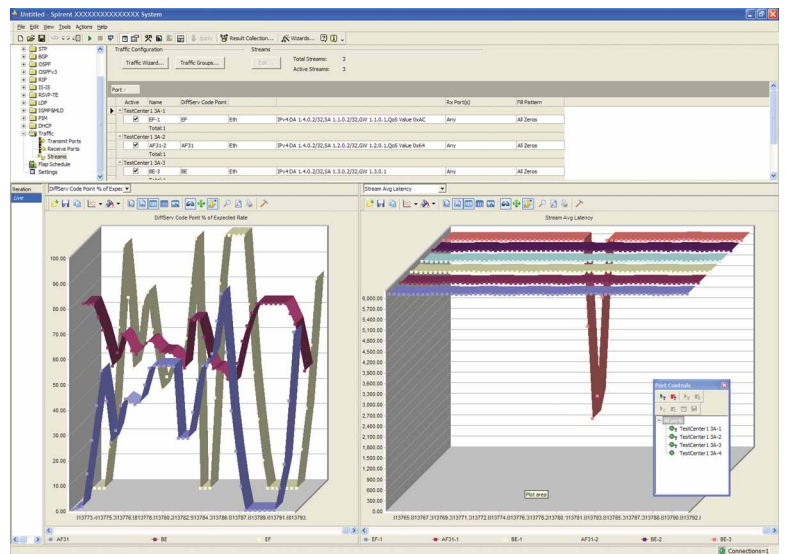


- Debug stateful algorithms with interactive, real-time control that allows focused stimulus to be invoked
- Identify long-term state change errors, such as memory leaks, by using the integrated flap schedule to emulate flapping behaviors
- Diagnose transient behaviors with results in the same view as traffic controls
- Imitate Internet link attributes with bursty or continuous transmit modes
- Interpret results by monitoring real-time graphs with per-flow and class of service forwarding rates and latencies over time
- Use integrated capture facility to debug filtering, encapsulation and state-machine issues
- Save time presenting test results with automatic report generation
- *Find scalability and performance related issues*
 - Benchmark performance and make product or build comparisons using measurements such as latency over time and throughput
 - Characterize performance over several key traffic parameters including frame size and load by using built-in iteration
- Emulate large networks with thousands of hosts—generate up to 32,767 streams per port and track up to 65,535 incoming streams per port
- *Increase productivity and reduce learning curve*
 - Easy to use GUI with logical layout, configuration wizards, copy/paste feature and configurable result/setup views allows quick setup and results interpretation for many emulated networks/hosts
- Web-based, class-based and customized training and services are available to accelerate learning or to provide technology, test creation, and test execution support
- *Reduce time to test*
 - Test and configuration wizards allow quick setup and test execution of complex tests
 - The integration of the scalability and functional modes allows the first-to-market ability to quickly troubleshoot and continue execution of large-scale tests in real time without changing test environments, delivering a significant timesaving for system-level testing

Key Features

- Easy-to-use GUI provides efficient configuration and analysis of traffic streams

- Traffic wizard quickly builds traffic from sourced to received networks, integrating the packet generator package with routing packages and helping to verify route table entries
- Interactive control enables functional and negative testing of address resolution and data plane implementation
- Supports Ethernet copper and fiber speeds from 10 megabits to 10 gigabits at full line rate
- Provides unique frame definition of the headers for layers 2-4 on each stream
- Up to six fields may be defined for each stream and varied to create millions of flows to quickly test device and network capacities
- Full support of Address Resolution Protocol (ARP) and Neighbor Discovery Protocol (NDP) for realistic and dynamic testing
- All functionality fully supported in automation environment
- Supports transmit rate and burst per stream



Test Results

Spirent TestCenter provides both real-time and final test results using spreadsheets and graphical formats. These results can be exported in comma separated value (.CSV) file format or HTML for spreadsheet or browser-based analysis and reporting.

Real-time Test Results

These results can be displayed by port, by stream, by predefined tracking options (including prefix length, VPN, ToS, protocol and destination TCP/UDP port) or by user-defined groups.

- Receive frame rate graph
- Percentage of expected frame rate graph
- Average latency graph

- Detailed counters with min/ave/max latency and in/out of sequence
- Control plane transmit and receive capture and export to user-defined protocol decoder enables detailed troubleshooting and analysis without interrupting the test

Final Test Results

- Final receive frame rate graph from the beginning of the iteration to the end
- Final average latency graph from the beginning of the iteration to the end
- Final detailed port counters
- Final TX/RX statistics including TX/RX frame count, lost frames, % lost, min/ave/max latency, in/out of sequence and stray frames
- Per-stream latency distribution measurement
- All graphs have integrated flap events
- Data plane receive capture and export to protocol decoder

Technical Specifications

Key Tests

- Optionally enable or disable streams
- Full Layers 2-4 header configuration per stream including
 - Ethernet header
 - VLAN ID or stacked VLAN IDs with priority per stream
 - MPLS label of label stack with control of experimental bits
 - IP header information with IP options or header extensions
 - IP QoS settings per ToS or DSCP
 - TCP or UDP header
- Optionally configure flows per traffic stream through the use of up to six thirty-two bit modifier fields. Two of these fields are IP-aware and can be configured to skip CIDR IP broadcast and multicast addresses. Typically a user will vary the source and destination MAC addresses, source and destination IP addresses, and two other fields such as ToS or VLAN ID
- Dynamically and interactively modify traffic characteristics
- Transmission rates can be configured per stream or per port
- Jumbo frames supported with user-definable jumbo frame counters

Test configuration:

- Test duration: fixed, continuous, time burst, frame burst
- Load units: frames/second, % of line rate, Mbps, kbps or bps
- Burst size in frames
- Loads: fixed, stepped, or random with min and max
- Frame sizes: fixed, stepped, or random with min/max

Flap Schedule

- Create up to 64 steps with configurable time delays
- Flap through all the steps once or continuously cycle
- Each step can have multiple events
- Events include a combination of physical, protocol, and traffic conditions such as link down/up, traffic on/off, or simulating a route withdraw and re-advertise (if the Unicast Routing Base Package is enabled)

Supported Modules

Module	Description
CPR-1001A	10/100/1000 Copper RJ-45, 8 Port
EDM-1001A	10/100/1000 Dual Media, 4 Port
FBR-1001A	1G Fiber SFP, 8 Port
XFP-1001A	10G XFP, 1 Port
CPR-2001A	10/100/1000 Copper RJ-45, 8 Port
EDM-2001A	10/100/1000 Dual Media, 4 Port
FBR-2001A	1G Fiber SFP, 8 Port
CPR-2002A	10/100 Copper RJ-45, 8 Port
XFP-2001A	10G XFP, 1 Port

Requirements

- An SPT-2000A Spirent 2U chassis and controller or SPT-5000A Spirent 5U chassis and controller with the appropriate hardware modules
- Pentium™ or greater PC running Windows® 2000 SP4 or XP SP1/1A/2 with mouse/color monitor required for GUI operation
- Automated operation requires Pentium™ or greater PC running Windows® 2000 SP4 or XP SP1/1A/2, Red Hat Enterprise Workstation Linux 3.0 or SUN Solaris 7.0/8.0

Ordering Information

BPK-1001A Packet Generator and Analyzer Base Package

Other related Spirent TestCenter software available:

BPK-1002A STP/RSTP/PVST+Base Package

BPK-1003A IGMP/MLD Host IP Multicast Base Package

BPK-1004A/1004B Unicast Routing Base Package

BPK-1005A/1005B Multicast Routing Base Package

BPK-1006A/1006B MPLS/LDP/RSVP-TE Base Package

BPK-1007A/1007B PPPoX Base Package

BPK-1008A/1008B DHCP Base Package

Part numbers ending in “A” indicate a limited-performance version; those ending in “B” indicate the full performance version.

Spirent Global Services

Spirent Global Services provides a variety of professional services, support services, and education services — all focused on helping customers meet their complex testing and service assurance requirements. For more information, visit the Global Services website at www.spirentcom.com/gs or contact your Spirent sales representative.

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