SPIRENT TESTCENTER

THE STANDARD FOR TESTING TOMORROW'S NETWORKS

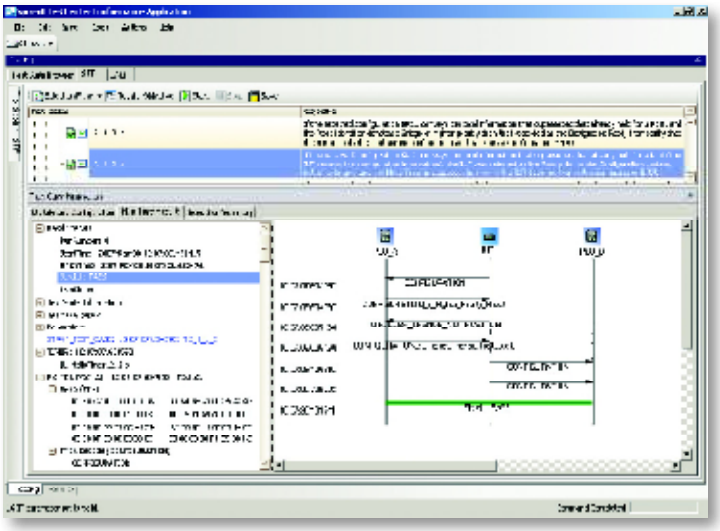
CONFORMANCE APPLICATION

Convergence is creating a new generation of integrated network devices and services that are much more complex than ever before. The resulting increased complexity, scarcity of testing skills and architectural shortcomings in current test systems are hurting the ability of manufacturers to ship products on time at escalating quality levels and slowing service providers' ability to deploy networks that get Quality of Experience (QoE) right the first time.

INCREASE PRODUCTIVITY: GET THERE FASTER WITH SPIRENT TESTCENTER

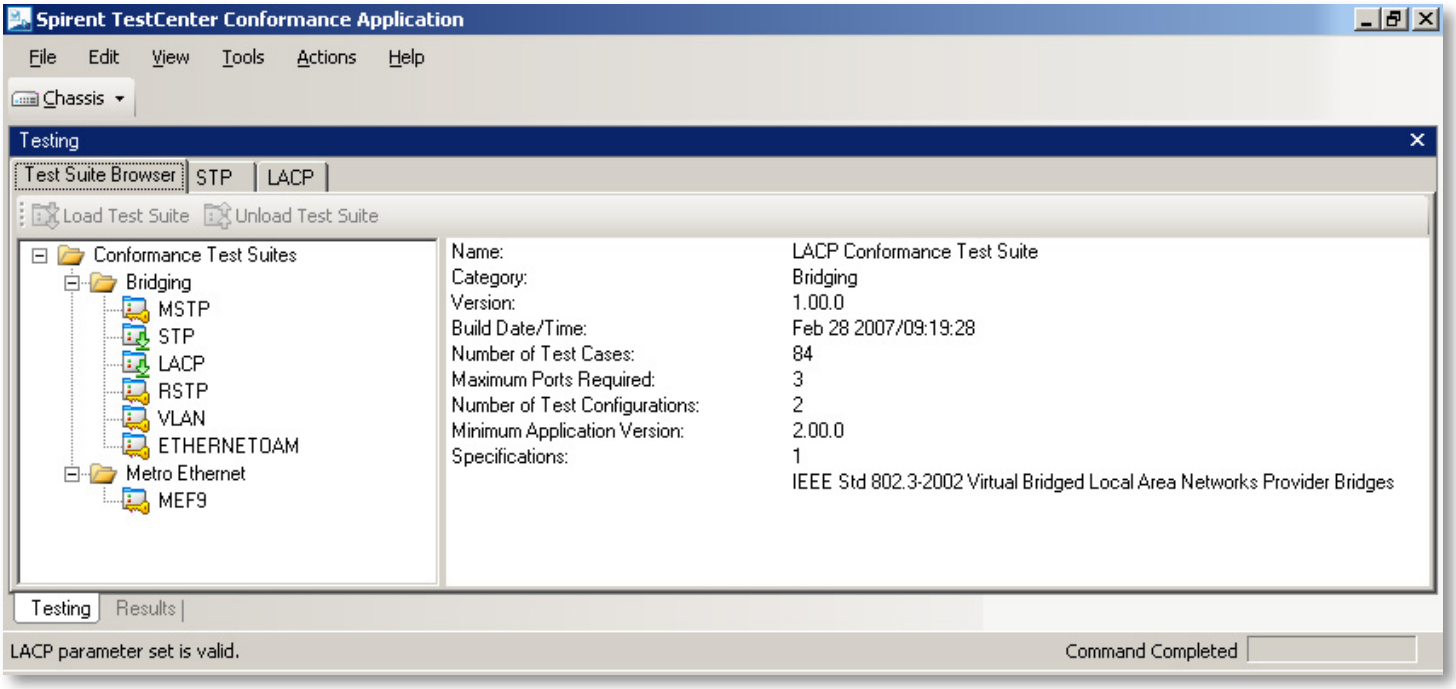
- Multiple test suites can be run sequentially without user intervention. This key capability aves time by allowing the user to configure and then execute multiple test suites without any further interaction. The user can then move on to other tasks and analyze the data later in the day once all tests are completed.
- The user can automate all interaction with the device under test, eliminating the need for a user to actively monitor the test
- A hierarchical view of pass, fail, or inconclusive results enables users to quickly find any issues when looking through hundreds or thousands of results
- Multiple results views including pass/fail, packet decodes, ladder diagrams and raw hex views facilitate rapid identification and analysis of failure or inconclusive conditions
- Easily compare the results from multiple test runs to facilitate bug-tracking metrics through regression cycles
- User can rerun tests based on their conclusion in a previous test (e.g. pass, fail, or inconclusive). This unique ability allows users to quickly focus on problem areas during troubleshooting phases of the test cycle.

Spirent can help you address this challenge with Spirent TestCenter™ and its innovative Inspire Architecture™. Now you can create and execute more complex test cases in less time with the same resources – and scale tests higher while debugging problems faster. The results: lower CAPEX and OPEX, faster time to market, greater market share and higher profitability. The Conformance Application enables customers to lower development costs and improve product interoperability by identifying correct protocol operation earlier in the development cycle. Best effort is not enough. Ten years ago, enterprises approached data communications as an interesting opportunity to evolve portions of their business. These new capabilities unlocked new sales channels, improved enterprise management and business-to-business transactions on a wide scale. As these facilities migrated from niche deployments to become primary business activities, the underlying network became mission critical.



SPIRENT TESTCENTER

CONFORMANCE APPLICATION



The data communications industry is evolvingto meet the divergent needs of increasingfunctionality, lowering communications costand addressing a very large deployment foran ever-increasing customer base. To add tothe challenges, new products must work in thesame network with existing products from theprevious decade of growth.

Interoperability, time-to-market and reliabilityare critical to the success of any new productor service. The Spirent TestCenter ConformanceApplication is uniquely suited to helpcustomers improve their testing process andensure their success in each of the aboveareas.

APPLICATIONS

- Determine the level of compliance with thestandards andspecifications relating to aprotocol or application
- Identify protocol failures earlier in thedevelopment and integration cycles toreduce project costs
- Isolate which non-interoperable products not behaving

BENEFITS

- Reduce time to test: By using BPK-1024A, testers can dramatically decrease the time required to test their network devices and qualify their new network services
  - User interaction with the test execution is completely eliminated. There is no need for the user to actively monitor the system to reconfigure the device under test or to manually start new tests.
  - Multiple test suites can be run simultaneously from a single Spirent TestCenter Conformance Application instance. This change enables chain multiple test suites together for sequential execution or to run multiple test suites in parallel to reduce test execution time.
  - Each test case is fully documented in the application. The documentation includes the specification section reference, the actual text from the section if the specification is in the public domain, an indication of the number of ports required for the test case, and a graphical depiction of the configuration being tested.
  - Multiple results views and execution options facilitate the rapid identification, comparison, troubleshooting and retesting of test cases

SPIRENT

- Industry-leading experience: BPK-1024A represents the next generation of conformance testing from the established leader in test and measurement
  - The Spirent TestCenter Conformance Application and test packages are developed by Spirent Communications and are not third-party products. The primary benefit to the customer is seamless and rapid execution of the conformance tests on Spirent TestCenter hardware and industry-leading technical support.
  - Established expertise in numerous technologies including Ethernet, IPv6, routing, broadband access and multicast technologies
- Leverages the investment of a single platform to serve multiple needs. Spirent TestCenter has been designed from the ground up to serve the needs of the telecommunications industry for the next decade.
  - The Spirent TestCenter Conformance Application works with the entry-level Series 1000, the Series 2000 and the latest HyperMetrics CV and CM modules
  - Once conformance testing is complete, the system can be reused for functional and performance testing
  - An investment in Spirent TestCenter is protected by the long technological life of this product. Spirent will continue to develop and integrate more solutions into Spirent TestCenter to deliver both a broadened technology footprint and dramatically improved productivity.

SUPPORTED MODULES

HyperMetrics CV and CM and Series 2000 and 1000 modules.

All conformance test suites currently support all Spirent TestCenter Layer 2-3 test modules and personality cards.

REQUIREMENTS

- Pentium or greater PC running Windows® with mouse/color monitor required for GUI operation. (See BPK-1001A data sheet for supported operating systems and Minimum PC Requirements)
- One Ethernet cable and one 10/100/1000 Mbps Ethernet card installed in the PC
- A SPT-2000A Spirent 2U Chassis and Controller, SPT-5000A Spirent 5U Chassis and Controller or SPT-9000A Spirent 9U Chassis and Controller

OREDERING INFORMATION

Part Number	Base Package Name	
BPK-1024A	BPK-1024A Conformance Application Base Package A	
Part Number	**Test Solution Name**	**Supported Test Packages**
Technology Test Solutions		
SPK-1055	CTS CARRIER ETHERNET TEST SOLUTION	CFM, LINK OAM, MEF 9/14/21 (TPK-0029, TPK-0034, TPK-1006, TPK-1012, TPK-1049)
SPK-1056	CTS ADVANCED BRIDGING TEST SOLUTION	MSTP, VLAN, PB, PBB, MMRP, MVRP (TPK-1007, TPK-1008, TPK-1036, TPK-1037, TPK-1038, TPK-1047)
SPK-1057	CTS MPLS SERVICES TEST SOLUTION	PWE3, VPLS-LDP, PMTP-TE (TPK-0025, TPK-0028, TPK-1048)
SPK-1058	CTS HIGH AVAILABILITY TEST SOLUTION	LACP, VRRP, OSPFv2/v3 GR, BFD (TPK-1009, TPK-1028, TPK-1034, TPK-1035, TPK-1046)
SPK-1059	CTS UNICAST ROUTING TEST SOLUTION	BGP4 v4/6, OSPFv2/v3, ISISv4/v6, RIPv1/v2/NG (TPK-0017, TPK-0018, TPK-1015, TPK-1017, TPK-1018, TPK-1029, TPK-1030, TPK-1041)
SPK-1060	CTS MULTICAST ROUTING TEST SOLUTION	PIM-SMv4/v6, PIM-BSRv4/v6, MSDP (TPK-0021, TPK-0022, TPK-0023, TPK-0024, TPK-1039)
SPK-1061	CTS IPV6 BASE TEST SOLUTION	IPv4/v6 INTERWORKING AND EXTENSIONS, IPv6 (TPK-0019, TPK-0020, TPK-1013)
SPK-1062	CTS LAN SWITCHING TEST SOLUTION	IGMP SNOOPING, MLDv2 SNOOPING, LLDP, LLDP-MED (TPK-0031, TPK-1019, TPK-1027, TPK-1031)
SPK-1063	CTS IPV6 HOST TEST SOLUTION	DHCPv6 HOST, IPv6 HOST (TPK-0032, TPK-1016)
SPK-1064	CTS MULTICAST GROUP MANAGEMENT TEST SOLUTION	IGMPv2/v3, MLDv1/v2 (TPK-0026, TPK-0030, TPK-1014, TPK-1040)
SPK-1089	CTS DATA CENTER TEST SOLUTION	DCBX, FIP(TPK-1052, TPK-1053)
SPK-1087	CTS SECURITY TEST SOLUTION	IPSEC-IKE, IPSEC-ESP, IPSEC-AH (TPK-1043, TPK-1044, TPK-1045)

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ORDERING INFORMATION (CONTINUED)			
Part Number	**Test Package Name**	**Supported Test Features**	**Revalent Specifications**
IP Rouiting			
TPK-0017	CTS BGP-4 IPv6 TEST PACKAGE	BGP-4 for IPv6 • BGP/OSPF Interaction • BGP Communities Attribute • BGP Route Flap Damping • Route Refresh for BGP-4 • AS Confederations • Multiprotocol Extensions for BGP-4 • Use of Multiprotocol Extensions • BGP Support for Four-octet AS Number Space • Graceful Restart Mechanism for BGP • Cooperative Route Filtering Capability for BGP-4 • BGP Extended Communities Attribute • Capabilities Advertisement with BGP-4 • Address Prefix Based Outbound Route Filter for BGP-4	• RFC 4271 • RFC 1403 • RFC 2439 • RFC 2918 • RFC 4360 • RFC 3392 • RFC 2545 • Draft-ieft-idr-rfc3065bis-05 • draft-ietf-idr-rfc2796bis-02 (obsolete RFC 2796) • draft-ietf-idr-rfc2858bis-08 • draft-ietf-idr-as4bytes-12 • draft-ietf-idr-restart-10 • draft-ietf-idr-route-filter-11 • draft-ietf-idr-bgp-prefix-orf-02
TPK-0018	CTS BGP-4 IPv4 TEST PACKAGE	BGP-4 for IPv4 • BGP/OSPF Interaction • BGP Communities Attribute • BGP Route Flap Damping • Route Refresh for BGP-4 • AS Confederations • Multiprotocol Extensions for BGP-4 • BGP Support for Four-octet AS Number Space • Graceful Restart Mechanism for BGP • Cooperative Route Filtering Capability for BGP-4 • BGP Extended Communities Attribute • Capabilities Advertisement with BGP-4 • Address Prefix Based Outbound Route Filter for BGP-4	• RFC 4271 • RFC 1403 • RFC 2439 • RFC 2918 • RFC 4360 • RFC 3392 • RFC 2545 • Draft-ieft-idr-rfc3065bis-05 • draft-ietf-idr-rfc2796bis-02 (obsolete RFC 2796) • draft-ietf-idr-rfc2858bis-08 • draft-ietf-idr-as4bytes-12 • draft-ietf-idr-restart-10 • draft-ietf-idr-route-filter-11 • draft-ietf-idr-bgp-prefix-orf-02
TPK-0019	CTS IPV4/V6 INTERWORKING TEST PACKAGE	• Common tunneling transition mechanisms, including configured tunneling and automatic tunneling • NAT-PT TCP, UDP and ICMP checksum calculation and checking • NAT-PT FTP Application Level Gateway (ALG) functionality check • Intra-Site Automatic Tunnel Addressing Protocol (ISATAP) verification • Stateless IP/ICMP protocol translation algorithm verification for both IPv4 to v6 and IPv6 to v4 protocol translation • Exercise IPv4 over an IPv6 tunnel in the dual stack transition mechanism • Verify generic packet tunneling including nested encapsulation, tunnel packet size and tunnel error process validation • Functionality verification of the connection of IPv4-IPv6 domains via IPv4 clouds	• Draft-ietf-ngtrans-dstm-07 • RFC 2473 • RFC 2893 • RFC 3056

ORDERING INFORMATION (CONTINUED)			
Part Number	**Test Package Name**	**Supported Test Features**	**Revalent Specifications**
IP Rouiting			
TPK-0020	CTS IPv4v6 INTERWORKING EXTENSION TEST PACKAGE	• NAT-PT TCP, UDP and ICMP checksum calculation and checking • NAT-PT FTP Application Level Gateway (ALG) functionality check • Intra-Site Automatic Tunnel Addressing Protocol (ISATAP) verification • Stateless IP/ICMP protocol translation algorithm verification for both IPv4 to v6 and IPv6 to v4 protocol translation	• RFC 2766 • RFC 2765 • RFC 4214
TPK-1013	CTS IPV6 TEST PACKAGE	• NDP • Stateless Autoconfiguration • Path MTU Discovery • IPv6 Jumbograms • ICMP • Connecting IPv6 Domains via IPv4 Clouds • Inverse Discovery for NDP	• draft-ietf-ipngwg-icmp-v3-02 • RFC 1981 • RFC 2374 • RFC 2460 • RFC 2461 • RFC 2675 • RFC 3056 • RFC 3122 • RFC 4443 • RFC 2462
TPK-1015	CTS OSPFv3 TEST PACKAGE	• Adjacency establishment, maintenance, and deletion • Designated router election • Error handling • Preferred path hierarchical routing • Database exchange • Neighbor state verification • Support for virtual link • LSA operation and support for the various LSA fields Support for different types of routers—such as internal routers, area border routers, • backbone routers, and AS boundary routers • OSPFv3 header and IPv6 header format checking for OSPFv3 protocol packets • OSPFv3 packet format checking • Verification of OSPFv3 operation per-link basis • Verification of OSPFv3 multiple protocol instance operation over a single link • Support of multiple prefixes on a single interface • Point-to-point, NBMA (non-broadcast multi-access) and Ethernet network operation	• RFC 2328 • RFC 2740

ORDERING INFORMATION (CONTINUED)			
Part Number	**Test Package Name**	**Supported Test Features**	**Revalent Specifications**
IP Rouiting			

TPK-1016	CTS IPV6 HOST TESTING TEST PACKAGE	• IPv6 tests
		  • Extension headers
		• Neighbor Discovery tests
		  • Router Prefix Discovery
		  • Address Resolution & Neighbor Unreachability Detection
		• ICMPv6 tests
		  • Processing rules
		  • Error messages
		  • Informational messages
		• IPv6 stateless address autoconfiguration
			• RFC 2460
			• RFC 2461
			• RFC 4443
			• RFC 2462

TPK-1017	CTS OSPFV2 TEST PACKAGE	• Adjacency establishment, maintenance, and deletion • Designated router election • Error Handling • Preferred path hierarchical routing • Database exchange • Neighbor state verification • Support for virtual link • LSA operation and support for the various LSA fields • Support for different types of routers, including internal routers, area border routers, backbone routers, and AS boundary routers • Point-to-point, non-broadcast Multi Access (NBMA) and broadcast operation	• RFC 1587 • RFC 1765 • RFC 1793 • RFC 2328 • RFC 2370
TPK-1018	CTS RIPV1V2 TEST PACKAGE	• RIPv1 and RIPv2 interoperability • Request message processing • Response message processing • Packet forwarding via RIP learned routes • Split horizon • Timers • Text authentication	• RFC 2082 • RFC 2453
TPK-1028	CTS VRRP TEST PACKAGE	• VRRP protocol requirements and overview • VRRP packet format • Protocol state machines • Sending and receiving validation • Response to host ARP requests • Multiple Virtual Routers scenario	• RFC 3768

ORDERING INFORMATION (CONTINUED)			
Part Number	**Test Package Name**	**Supported Test Features**	**Revalent Specifications**
IP Rouiting			
TPK-1029	CTS IS-ISv4 TEST PACKAGE	• Can be concurrently or separately run in IPv4, and OSI environments • Level 1 and Level 2 adjacency operations, including establishment, maintenance, and deletion for point-to-point and broadcast operations • IPv4 extensions for adjacency establishment • Level 1 and Level 2 adjacency independence for point-to-point and broadcast operations • Designated IS election and resignation • IS-IS Update process integrity for point-to-point and broadcast operations • IS-IS Decision process operation • IPv4 extension summary address operation • Manual routing information propagation • Attach flag management • Address summarization • External link operation • Adjacency state table operation, including maintenance, establishment, and deletion OSI and IP authentication for link, area, and domain authentication • Level 1 and Level 2 routing • ESH PDU handling/soliciting ES configuration • Protocol error scenarios • PDU encoding errors • Timer jitter measurement	• ISO/IEC 10589:1992 • ISO/IEC 10589:1992/Cor.1: 1993 • ISO/IEC 10589:1992/Cor.2: 1996 • ISO/IEC 10589:1992/Cor.3: 1996 • IETF RFC 1195
TPK-1030	CTS IS-ISv6 TEST PACKAGE	• Can be concurrently or separately run in IPv6, and OSI environments • Level 1 and Level 2 adjacency operations, including establishment, maintenance, and deletion for point-to-point and broadcast operations • IPv6 extensions for adjacency establishment • Level 1 and Level 2 adjacency independence for point-to-point and broadcast operations • Designated IS election and resignation • IS-IS Update process integrity for point-to-point and broadcast operations • IS-IS Decision process operation • IPv6 extension summary address operation • Manual routing information propagation • Attach flag management • Address summarization • External link operation • Adjacency state table operation, including maintenance, establishment, and deletion OSI and IP authentication for link, area, and domain authentication • Level 1 and Level 2 routing • ESH PDU handling/soliciting ES configuration • Protocol error scenarios • PDU encoding errors • Timer jitter measurement	• Draft-ietf-isis-ipv6-05 • ISO/IEC 10589:1992 • ISO/IEC 10589:1992/Cor.1: 1993 • ISO/IEC 10589:1992/Cor.2: 1996 • ISO/IEC 10589:1992/Cor.3: 1996 • RFC 1195

ORDERING INFORMATION (CONTINUED)			
Part Number	**Test Package Name**	**Supported Test Features**	**Revalent Specifications**
IP Routing			
TPK-1041	CTS RIPNG TEST PACKAGE	• Request Message Processing • Response Message Processing • Split Horizon • Timers • Forwarding	• RFC 3623 • RFC 2328
TPK-1034	CTS OSPFV2 GRACEFUL RESTART TEST PACKAGE	• Message Format • Restarting Router • Helper Mode	• RFC 3623 • RFC 2328
TPK-1035	CTS OSPFV3 GRACEFUL RESTART TEST PACKAGE	• Message Format • Restarting Router • Helper Mode	• draft-ietf-ospf-ospfv3-graceful-restart-07.txt • RFC 3623 • RFC 2328

TPK-1009	CTS BFD TEST PACKAGE	• BFD Message format verification
		  • State Machine transitions
		  • Sending and receiving of BFD Echo messages
		  • IUT operation in BFD asynchronous and demand mode
		  • Implementation of SHA1, MD5 and Simple Password authentication
		  • Sending and receiving of BFD control packets
		  • Functional testing for BFD Multihop operation
			• draft-ietf-bfd-base-08.txt: Bidirectional Forwarding Detection
			• draft-ietf-bfd-multihop-06.txt: BFD for Multihop Paths
			• draft-ietf-bfd-v4v6-1hop-08.txt: BFD for IPv4 and IPv6 (Single Hop)

IP Multicast			
TPK-0021	CTS PIM-SM IPV6 TEST PACKAGE	**PIM-SM operation over IPV6** • PIM-SM Finite state machines • Hello message processing and Designated Router Election • Register message processing • Join/Prune message processing • Assert message processing • PIM-SM Timers • PIM-SM packet format • Optional Informational (these test cases verify optional requirements and provide helpful information regarding the support of such requirements on the IUT) • SSM - Source Specific Multicast • Interoperability of PIM-SM with the following host routing protocols: MLDv1 and MLDv2 • Support of RIP and BGP unicast routing protocol for creating the PIM-SM multicast routing table • Support for the following Layer 2 types: Broadcast, NBMA and PPP	• Draft-ietf-pim-sm-v2-new-07 **Supplementary:** • Draft-vida-mld-v2-07 • RFC 2710 • RFC 2715

ORDERING INFORMATION (CONTINUED)			
Part Number	**Test Package Name**	**Supported Test Features**	**Revalent Specifications**
IP Multicast			
TPK-0022	CTS PIM-SM IPV4 TEST PACKAGE	**PIM-SM operation over IPV6** • PIM-SM Finite state machines • Hello message processing and Designated Router Election • Register message processing • Join/Prune message processing • Assert message processing • PIM-SM Timers • PIM-SM packet format • Optional Informational (these test cases verify optional requirements and provide helpful information regarding the support of such requirements on the IUT) • SSM - Source Specific Multicast • Interoperability of PIM-SM with the following host routing protocols: MLDv1 and MLDv2 • Support of RIP and BGP unicast routing protocol for creating the PIM-SM multicast routing table • Support for the following Layer 2 types: Broadcast, NBMA and PPP	• Draft-ietf-pim-sm-v2-new-07 **Supplementary:** • Draft-vida-mld-v2-07 • RFC 2710 • RFC 2715
TPK-0023	CTS PIM-BSR IPV4 TEST PACKAGE	**PIM-BSR IPv4** • State transitions for Candidate BSR • State transitions for Non-Candidate BSR • Admin-Scope and Non-Admin scope operation • Periodic Transmission • Updating the RP to group mapping • BSM validation • Bootstrap Message format • C-RP Adv message format	• Draft-ietf-pim-sm-bsr-06
TPK-0024	CTS PIM-BSR IPV6 TEST PACKAGE	**PIM-BSR IPv6** • State transitions for Candidate BSR • State transitions for Non-Candidate BSR • Admin-Scope and Non-Admin scope operation • Periodic Transmission • Updating the RP to group mapping • BSM validation • Bootstrap Message format • C-RP Adv message format	• Draft-ietf-pim-sm-bsr-06
TPK-0026	CTS IGMPv3 TEST PACKAGE	• Format verification for IGMPv3 Query and IGMPv3 Report messages • Operation as an IGMPv3 Group Member • Operation as an IGMPv3-capable Multicast Router • Multicast data forwarding • Interoperability with IGMPv2	• RFC 2236 • RFC 3376

ORDERING INFORMATION (CONTINUED)			
Part Number	**Test Package Name**	**Supported Test Features**	**Revalent Specifications**
IP Multicast			
TPK-0030	CTS IGMPV2 TEST PACKAGE	• Format verification for IGMPv2 Query and IGMPv2 Report message • Operation as IGMPv2 Group Member • Operation as IGMPv2 capable Multicast Router. • Interoperability with IGMPv1	• RFC 2236
TPK-0031	CTS IGMP SNOOPING TEST PACKAGE	• IGMPv2 and IGMPv3 message forwarding • Multicast data forwarding • IGMP v2/v3 interoperability • IGMPv2 and IGMPv3 Snooping Querier	• RFC 4541
TPK-1014	CTS MLDV2 TEST PACKAGE	• IFormat verification for MLDv2 Query and MLDv2 Report message • Operation as MLDv2 Listener • Operation as MLDv2 capable multicast router • Multicast data forwarding • Informational (these test cases are for optional specifications and provide information regarding the protocol implementation under test) • Interoperability with MLDv1	• RFC 3810
TPK-1019	CTS MLD SNOOPING TEST PACKAGE	• MLDv1 and MLDv2 message forwarding • Multicast data forwarding. • MLDv1/v2 Interoperability • MLDv1 and MLDv2 Snooping Querier	• RFC 4541
TPK-1040	CTS MLDV1 TEST PACKAGE	• IPv6 header options, source and destination addresses formatting • MLD messages formatting and contents validation • Reserved fields handling • Multicast group joining/leaving procedures • Startup procedures • Multicast group solicitation procedures • Querier and Non-Querier operations and transition procedures	• RFC 2464 • RFC 2710 • RFC 2711

TPK-1039	CTS MSDP TEST PACKAGE	• MSDP Protocol Operation
		  • Caching SA- messages.
		  • MSDP Peer-RPF forwarding.
		  • MSDP mesh group operation.
		  • Source-Active Filtering
		• MSDP Packet Format Verification
		  • Source-Active Message processing
		  • Source-Active TLV format verification
		  • Packet Format Error processing
		• MSDP Timers
			• RFC 3618

ORDERING INFORMATION (CONTINUED)			
Part Number	**Test Package Name**	**Supported Test Features**	**Revalent Specifications**
VPN & MPLS			
TPK-0025	CTS PWE3 ETHERNET ENCAP TEST PACKAGE	**Ethernet, Ethernet VLAN** • Pseudowire signaling (using LDP) including tunnel establishment, tunnel deletion and tunnel error handling • Pseudowire signaling support for capability exchange for control word usage, FCS retention, Fragmentation, VCCV • Pseudowire status notification using either label withdraw, PW Status TLV or wildcard withdraw • Pseudowire signaling support for Generalized PWID FEC (129), including support for related TLVs (Group ID TLV and PW Interface Parameters TLV) • Layer 2 error handling • Sequence number processing • Virtual Circuit Connectivity Verification (VCCV) with LSP-Ping Encapsulation • Ethernet encapsulation FCS retention • Ethernet encapsulation fragmentation • RSVP-TE or LDP as core tunneling protocol	• draft-ietf-pwe3-control-protocol-17 • draft-ietf-pwe3-ethernet-encap-11 • RFC 4385 • draft-ietf-pwe3-fcs-retention-04 • draft-ietf-pwe3-fragmentation-10 • draft-ietf-pwe3-vccv-07

TPK-0028	CTS VPLS TEST PACKAGE	• Supports different MPLS label distribution mechanisms (RSVP-TE, LDP) for tunnel label distribution within the MPLS core network
		• Supports the following layer 2 encapsulations
		  • Ethernet
		  • Ethernet VLAN
		  • Control Word usage
		• Verifies VC Tunnel Set Up
		  • VC tunnel establishment
		  • Control Word negotiation
		  • VC tunnel deletion
		• Verifies VPLS topological model
		  • Data flooding (proper operation w/ various multicast, broadcast and unknown addresses)
		  • Spanning tree protocol PDU handling
		• Verifies Control Plane functionality - MAC TLV handling in Address Withdraw message
		• Verifies data forwarding functionality - Support of qualified and unqualified learning for overlapping and unique customer MAC address space
		• Verifies Hierarchical Model support
		  • Interworking of the IUT with MTUs or PEr
		  • Exercises the redundant spoke connections
		• Functional Tests
		  • Checks for proper MAC address learning across user-specified range of MAC addresses and/or VLAN IDs from directly connected customer interfaces and from pseudo-wire connected interfaces.
		  • Checks for proper packet forwarding across user-specified range of MAC addresses and/or VLAN IDs from core to edge and from edge to core.
		  • Checks for proper packet forwarding w/ different ether type fields
			• RFC 4762
			• RFC 4447
			• RFC 4448
			• RFC 4665
			• RFC 4385

ORDERING INFORMATION (CONTINUED)			
Part Number	**Test Package Name**	**Supported Test Features**	**Revalent Specifications**
VPN & MPLS			
TPK-1048	CTS POINT-TO-MULTIPOINT RSVP-TE TEST PACKAGE	**This test suite includes coverage for the following areas:** • P2MP Mechanism • P2MP Path Message • Multiple sub LSPs in single Path • Multiple Path messages • P2MP Resv Message • Resv Message Throttling • ERO/SERO Processing • RRO/SRRO Processing • Path Tear Message • Notify Messages • ResvConf Messages • P2MP State Management • Error Processing : PathErr/ResvErr and Branch Failure Handling • Compatibility with P2P • LSP Remerge • P2Mp Message Object encodings • Invalid Packet handling	• RFC 4875 Extensions to Resource Reservation Protocol - Traffic Engineering (RSVP-TE) for Point-to-Multipoint TE Label Switched Paths (LSPs)
Security			
TPK-0027	CTS 802.1X TEST PACKAGE	• Verifies both the Authenticator and the Supplicant functionalities • Authenticator verification supports the use of a third-party Authentication Server (for example FreeRadius) or Spirent's own emulated RADIUS server • Exercises the test scenarios between the Backend Authentication state machine and the RADIUS server • Supports the use of either IPv4 or IPv6 for the RADIUS session • Supports the use of either IPv4 data packets or IPv6 data packets for verifying data path connectivity	• IEEE 802.1X-2004 **Supplementary standards from the IETF:** • RFC 3748 • RFC 2865 • RFC 3579 • RFC 3850 • RFC 1994 • RFC 2246 • RFC 2716 • draft-josefsson-pppext-eap-tls-eap-06.txt
TPK-1026	CTS IEEE 802.1X ADVANCED WITH PEAP AND TLS TEST PACKAGE	• Verifies both the Authenticator and the Supplicant functionalities • Uses Spirent's own emulated RADIUS server – the RADIUS server is emulated within the test suite itself and exercises the test scenarios between the Backend Authentication state machine and the RADIUS server • Supports MD5, EAP-TLS and PEAP based authentication type PDUs • Supports the use of IPv4 for the RADIUS session • Supports the use of either IPv4 data packets or IPv6 data packets for verifying data path connectivity	• IEEE 802.1X-2004 **Supplementary standards from the IETF:** • RFC 3748 • RFC 2865 • RFC 3579 • RFC 3850 • RFC 1994 • RFC 2246 • RFC 2716 • draft-josefsson-pppext-eap-tls-eap-06.txt
Carrier Ethernet			
TPK-0029	CTS ETHERNET CFM (802.1ag) TEST PACKAGE	**Verifies:** • Connectivity Check Protocol • Linktrace Protocol • Loopback Protocol • MEP and MHF functions • Validation tests of CFM PDUs and TLVs	• IEEE 802.1ag-D8

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ORDERING INFORMATION (CONTINUED)			
Part Number	**Test Package Name**	**Supported Test Features**	**Revalent Specifications**
Carrier Ethernet			
TPK-0034	CTS ETHERNET LINK OAM (802.3ah) TEST PACKAGE	**Verifies:** • OAM sublayer for Active and Passive mode functionalities • OAMPDU Reception • OAMPDU Transmission • Verify the OAM discovery mechanism • Verify the OAM transmit state diagram • Verify the OAM sublayer multiplexer state diagram • Verify the OAM Parse state diagram • Verify the OAM functions for monitoring link operation such as remote loopback control. • Initiating OAM Remote Loopback • During OAM Remote Loopback • Exiting OAM Remote Loopback • Verify the OAM Event Notification for link operation	• IEEE 802.3ah
TPK-1006	CTS MEF9 TEST PACKAGE	• MEF 6 – Ethernet Services Definition – Phase I • MEF 9 - Abstract Test Suite For Ethernet • Services at the UNI • MEF 10 (obsoletes MEF 1 and MEF 5) – • Ethernet Services Model, Phase 1 • MEF 11 – User Network Interface (UNI) Requirements and Framework	• MEF 1 • MEF 14

TPK-1007	CTS MSTP TEST PACKAGE	• Verify BPDU handling and bridge operation
		• Verify that the bridge correctly updates the learned station location information
		• Verify the configuration of active topology into a single spanning tree for any given VLAN
		• Verify that an implementation is compatible with previous standard, and can co-exist with RSTP and legacy bridges
		• Verify the operation of each bridge port that is represented by a set of state machines:
		  • Port timers state machine
		  • Port information state machine
		  • Port role selection state machine
		  • Port role transitions state machine
		  • Port state transition state machine
		  • Topology change state machine
		  • Port protocol migration state machine
		  • Port receive state machine
		  • Port transmit state machine
		• Verify general procedures such as:
		  • Packet format
		  • BPDUs validation
		  • Functional procedures
		  • Port variables
		  • Priority vector calculations
		  • Verify the setting of the MSTP parameters
			• IEEE 802.1Q-2003
			• IEEE 802.1s
			• IEEE 802.1w-2001

ORDERING INFORMATION (CONTINUED)			
Part Number	**Test Package Name**	**Supported Test Features**	**Revalent Specifications**
Carrier Ethernet			

TPK-1012	CTS MEF 14 TEST PACKAGE	• Allows user to use different EVC type (EPL, EVPL, and ELAN)
		• Performance Service Attributes
		  • Frame Delay Performance
		  • Frame Delay Variation Performance
		  • Frame Loss Ratio Performance
		• Bandwidth Profile Service Attributes
		  • Per Ingress UNI
		  • Per EVC
		  • Per Class of Service
			• MEF 10
			• MEF 14

TPK-1038	CTS PROVIDER BRIDGES (802.1AD) TEST PACKAGE	• Customer VLAN aware component conformance • Service VLAN aware component conformance • Layer 2 Protocol message processing • Provider Bridge Network Operation	• IEEE P802.1ad/D6.0 • IEEE P802.1ad/D2.0
TPK-1047	CTS 802.1ah (PBB) TEST PACKAGE	• **Customer Service Interfaces** – Three types of service interface defined for a Provider Backbone Bridge are tested for conformance: Port-based, S-tagged based and I-tagged based service interfaces. Also, the S-tagged service interface can be one of two types: one to one or bundled • **Provider Instance Ports** – A Provider Backbone Bridge is made up of I-components and a B-component. The I-component is the customer facing service interface. It comprises an S-VLAN component with the EISS on each Customer Network Port supported by the use of a Service VLAN tag, and the EISS for each Virtual Instance Port configured on a Provider Instance Port supported by the use of both a Service VLAN tag and a Backbone Service Instance tag. This test group tests the EISS for each Virtual Instance Port configured on a Provider Instance Port • **Customer Backbone Ports** – A Provider Backbone Bridge is made up of I-components and a B-component. A B-component comprises an S-VLAN component with the EISS on each Provider Network Port supported by the use of a Service VLAN tag, and the EISS on each Customer Backbone Port supported by the use of both a Service VLAN tag and a Backbone Service Instance tag. This test group tests the EISS on a Customer Backbone Port • **Functional Tests –** A set of test cases which provide the functional testing for the three types of service interface: Port-based service interface, S-tag based service interface and I-tag based service interface	• IEEE Std 802.1ah-2008: Virtual Bridged Local Area Networks - Amendment 7: Provider Backbone Bridges • IEEE Std 802.1Q-2005: Virtual Bridged Local Area Networks • IEEE Std 802.1ad-2005: Virtual Bridged Local Area Networks - Amendment 4: Provider Bridges

ORDERING INFORMATION (CONTINUED)			
Part Number	**Test Package Name**	**Supported Test Features**	**Revalent Specifications**
Carrier Ethernet			

TPK-1049	CTS MEF 21 TEST PACKAGE	• Abstract Test Cases for UNI-C Type 2 Link OAM
		  • OAM Functional Specifications
		  • OAM Event Notification Generation and Reception
		  • OAM PDUs
		  • OAM Local Information TLVs
		  • OAM Remote Information TLVs
		  • OAM Organization Specific Information TLVs
		  • Link Events TLVs
		  • Variable Descriptor & Containers
		  • OAM Additional Conformance Tests
		• Abstract Test Cases for UNI-N Type 2 Link OAM
		  • OAM Functional Specifications
		  • OAM Event Notification Generation and Reception
		  • OAM PDUs
		  • OAM Local Information TLVs
		  • OAM Remote Information TLVs
		  • OAM Organization Specific Information TLVs
		  • Link Events TLVs
		  • Variable Descriptor & Containers
		  • OAM Additional Conformance Tests
			• MEF 21 Abstract Test Suite for UNI Type 2 Part 1: Link OAM
			• MEF 20 UNI Type 2 Implementation Agreement
			• IEEE 802.3-2005 Clause 57 Operations, Administration, and Maintenance

Access			
TPK-0032	CTS DHCPV6 HOST TEST PACKAGE	• Message Validation • DHCP Server Solicitation • Client Initiated ConfigExchange • Server Initiated ConfigExchange • DHCP Options	• RFC 3315 • RFC 3633 • RFC 3646 • RFC 3736
TPK-0033	CTS DHCPV6 SERVER TEST PACKAGE	• Message Validation • DHCP Server Solicitation • Client Initiated ConfigExchange • Server Initiated ConfigExchange • DHCP Options	• RFC 3315 • RFC 3633 • RFC 3646 • RFC 3736
TPK-1033	CTS ANCP TEST PACKAGE	• ANCP Connection • TCP Connection • Adjacency Format • Adjacency State • Capability Negotiation • GSMP Extensions	• draft-ietf-ancp-protocol-02 • RFC 3292 • RFC 3293

ORDERING INFORMATION (CONTINUED)			
Part Number	**Test Package Name**	**Supported Test Features**	**Revalent Specifications**
Bridging			

TPK-1008	CTS VLAN TEST PACKAGE	• Ingress, Forwarding and Egress Rules
		• Frame Reception and Transmission
		• Learning Process
		• VLAN Classification
		• Filtering Database
		• Tagged Frame Format
		• Tagging/Untagging of layer2 data
		• GVRP (GARP VLAN Registration Protocol)
		  • Static VLAN Registration
		  • VLAN message propagation
		  • GARP state transitions for Applicant and Registrar state machines
		  • GARP Timers
		• GMRP (GARP Multicast Registration Protocol)
		  • Static MAC Multicast address registration
		  • Forwarding/Filtering of multicast traffic
		  • GARP state transitions for Applicant and Registrar state machines
		  • GARP Timers
			• IEEE 802.1Q-2005
			• IEEE 802.1D-2004

TPK-1009	CTS LACP/802.3AD TEST PACKAGE	**LACP** • LACPDU Format Verification • Receive State Machine • Periodic Transmission State Machine • Mux State Machine. **Marker Protocol** • PDU structure verification • Marker protocol operation. **Functional** • Capability to perform Link Aggregation • Dynamic reallocation of conversation to different ports	• IEEE 802.3-2005

ORDERING INFORMATION (CONTINUED)			
Part Number	**Test Package Name**	**Supported Test Features**	**Revalent Specifications**
Bridging			

TPK-1010	CTS STP TEST PACKAGE	• Communication of the bridge protocol entity with its peer entities
		• Update of stored protocol variables and timers
		• State change of the Bridge ports
		• Verifies all the procedures associated with the Bridge Protocol entity such as:
		  • Validation of Transmit Configuration Bridge Protocol Data Units (BPDUs)
		  • Recording of configuration information and configuration timeout value
		  • Reply to Configuration BPDUs
		  • Response to Transmit Topology Change Notification BPDUs
		  • Configuration updates
		  • Root selection process
		  • Designated port selection
		• Topology change detection and acknowledgement
		• Verifies Processing of frames received from individual MAC entities associated with the port, the submission of frames to the MAC entity for transmission, and the possible inclusion of the port in the active topology of the bridged LAN.
		• Verifies the basic functions of a bridge when it is selected to play roles such as a Root, Designated Bridge, or an Alternate Bridge.
		• Verifies the structures and encoding of the BPDUs that are exchanged between the Bridge Protocol Entities
			• IEEE 802.1D-1998

TPK-1011	CTS RSTP TEST PACKAGE	• Verifies proper Bridge Port behavior
		• Verifies the information contained in the BPDU may be used by a Bridge in calculating its own BPDU to transmit, and may stimulate that transmission.
		• Verifies the bridge updating the learned station location information correctly.
		• Verifies the operation of each Bridge Port that is represented by a set of state machines:
		  • Port Timers state machine
		  • Port Information state machine
		  • Port Role Selection state machine
		  • Port Role Transitions state machine
		  • Port State Transition state machine
		  • Topology Change state machine
		  • Port Protocol Migration state machine
		  • Port Transmit state machine
		• Verifies the general procedures such as:
		  • Packet format
		  • BPDUs Validation
		  • Functional procedures
		• Verifies the setting of the RSTP parameters
			• IEEE 802.1D-2004

ORDERING INFORMATION (CONTINUED)			
Part Number	**Test Package Name**	**Supported Test Features**	**Revalent Specifications**
Bridging			
TPK-1027	CTS LLDP (802.1AB) TEST PACKAGE	**LLDP Transmit** • Protocol initialization • Frame transmission • Transmission • LLDPDU construction • LLDP frame formatting transmission **LLDP Receive** • Protocol initialization • Frame reception • Frame recognition • LLDPDU Validation • LLDP remote MIB update • Statistical counter	• IEEE Std. 802.1AB-2005
TPK-1031	CTS LLDP-MED (ANSI/TIA-1057) TEST PACKAGE	• LLDP-MED initialization • LLDP-MED Capabilities TLV • Network Policy TLV • Location Identification TLV • Extended Power Via MDI TLV • Inventory Management TLV Set • LLDP TLV update • LLDP-MED transmission • LLDP-MED reception • Remote MIB TTL expiration • Frame Validation	• ANSI/TIA-1057-2006
TPK-1036	CTS MMRP (802.1AK) TEST PACKAGE	• Multiple MAC Registration Protocol • MRP State Transitions • MRP Timers • Forwarding and Filtering Rules for Data traffic • Validation of PDUs	• IEEE P802.1ak/D8 • IEEE P802.1ak/D8 Corrigendum 1

ORDERING INFORMATION (CONTINUED)			
Part Number	**Test Package Name**	**Supported Test Features**	**Revalent Specifications**
Switching			

TPK-1052	CTS DCBX TEST PACKAGE	• DCBX
		• Test the DCBX specific requirements beyond LLDP
		• DCBX_Control_State_Machine
		• DCBX_Feature_State_Machine
		  • Priority_Group_Feature
		  • Priority_Based_Flow_Control_Feature
		  • FCoE_Application_Feature
		• Other_Feature_TLVs (BCN TLV and Logical Link Status TLV)
			• DCB Capability Exchange Protocol Base Specification Rev 1.03
			• DCB Capability Exchange Protocol Base Specification Rev 1.0

TPK-1053	CTS FIP TEST PACKAGE	• Discovery Protocol: This test group verifies the FIP FCF Discovery between E-Node and FCF, and FCF-FCF. • Virtual Link Instantiation: This test group verifies the FLOGI procedure used by E-Nodes to login/logout into the fabric and the creation of VN ports and creation of VE ports for FCF. • Virtual Link Maintenance: Verifies the IUT's implementation of virtual link maintenance using FIP Keep Alive and periodic Discovery Advertisement messages. • VLAN Discovery: Verifies the procedure used by E-Node or FCF to get the VLANs supported by other FCFs for FIP operation. • FIP Frame Format: Verifies the format of the various FIP messages and descriptor formats used in FIP.	• INCITS xxx-200x Fibre Channel Backbone - 5 Rev 1.05 March 30, 2009: Fibre Channel — Fibre Channel Backbone - 5
Security			
TPK- 1043 TPK- 1044 TPK- 1045	CTS IPSEC TEST PACKAGE IPSEC- IKE IPSEC –ESP IPSEC -AH	• IPv4 and IPv6 data protection • ESP; AH; and ESP and AH protection: • ESP Supports the following encryption/decryption algorithms: data encryption • standard (DES), 3DES, advanced encryption standard (AES), NULL (uses ESP without encryption/decryption) • Supports the following authentication algorithms: hash-function message • authentication codes (HMAC)-Message Digest version 5 (MD5), HMACsecure • hash algorithm (SHA), NULL (uses ESP without authentication) • AH Supports the following authentication algorithms: HMAC-MD5, HMAC-SHA • Five (5) different Phase 1 authentication modes: • Supports the use or non-use of Perfect Forward Secrecy (PFS) • Tunnel Mode and Transport Mode • Main Mode and Aggressive Mode for Phase 1 negotiations • Quick Mode for Phase 2 negotiations • New Group Mode • Supports Extended Sequence Number	• RFC 4301 • RFC 4302 • RFC 4303 • RFC 2409 • RFC 2408 • RFC 2403 • RFC 2404 • RFC 2405 • RFC 2407 • RFC 2410 • RFC 2451 • RFC 3602

OTHER SPIRENT TEST CENTER SOFTWARE

In addition to the Spirent TestCenter Conformance Application, users should purchase each protocol test package. The table above can be used to identify which protocols and features are covered by each conformance test package. For additional details of the contents please contact your Spirent sales representative.

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