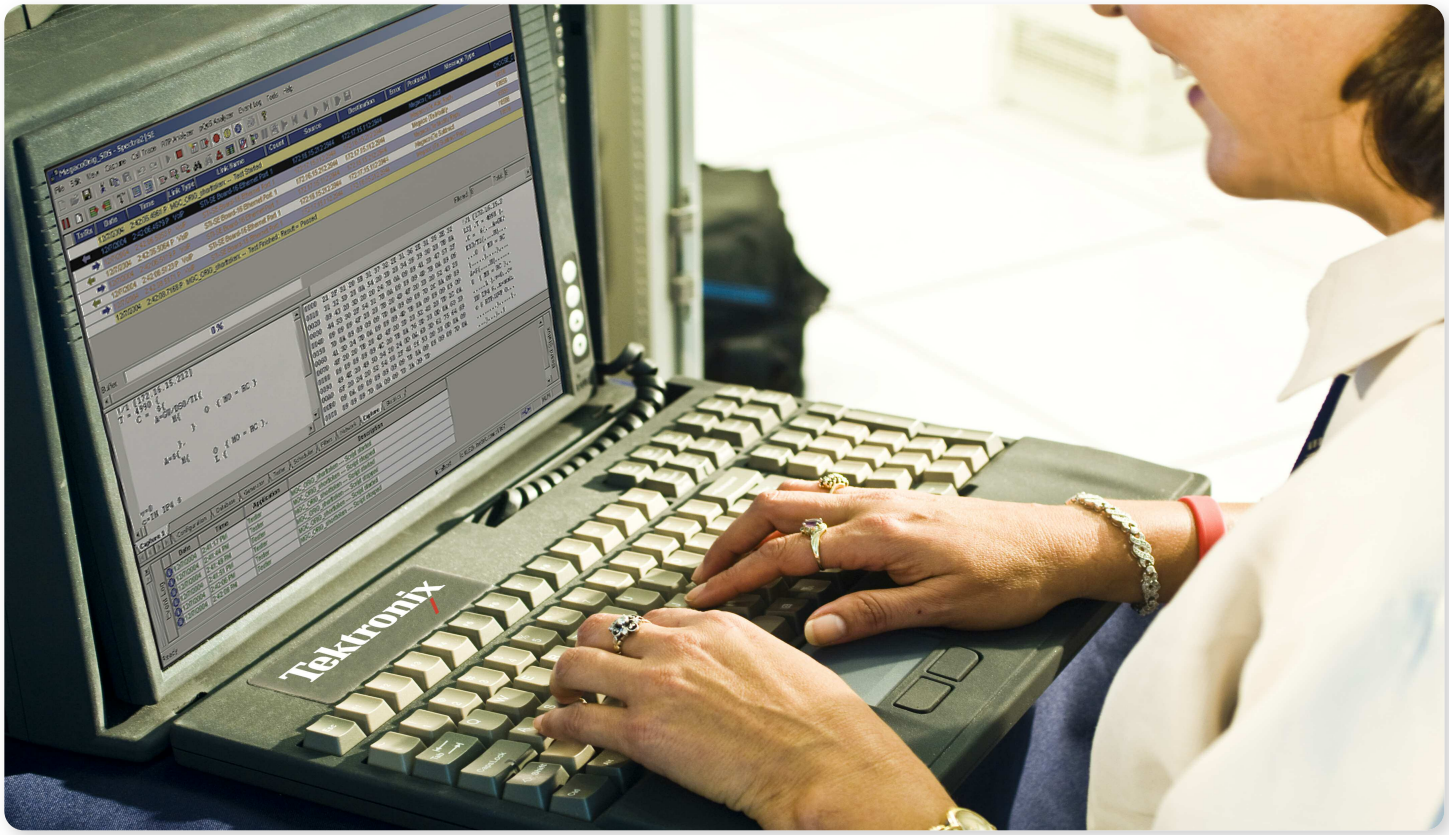
Spectra2 / Spectra2XL



Your ability to deliver on standards and interoperability is critical to your customers, critical to you, and critical to us. Our network testing expertise helps you build and maintain IMS, VoIP, PSTN and converged networks and environments from a single platform.

The answer to delivering product to your customers while meeting the market window is the Spectra2 and Spectra2XL comprehensive testing solution.

General

Easy-to-learn, easy-to-use interface means rapid deployment. Spectra2's Ping-Pong Editor simplifies editing and scripting of complex call models without sacrificing functionality.

Design, Develop, Deploy approach lets your development organization determine conformance, establish validation and interoperability, and establish real-time performance on a single integrated test platform.

Spectra2:

- Functional, Load, and Media testing in a single multi-user platform
- World class protocol, codec and conformance testing
- Powerful element emulation
- Easy to Use, Easy to Learn, Easy to Automate

Spectra2XL:

- An Extreme High Capacity Hardware Option for Load Testing of IMS, VoIP and PSTN core networks

Tektronix®
Enabling Innovation

Benefits & Features

Benefits

- Functional Test, Load Test and monitor your PSTN, VoIP and IMS network in one integrated solution
- Maximize workforce productivity with easy-to-learn user interface
- Manage complex test scenarios with ease
- Control costs with a la carte software structure to pick only the applications that you need

Features

- Built-in standards based protocol library (incl. Country variants)
- Network Element Emulation
- Message and Call Flow customization
  - Conditional Branching
  - Selective capture and replacement of message parameters during active calls (Get/Put)
  - Message customization
- Packaged Conformance Test Suites
- Flexible easy to use scripting interface
- Application Program Interface (API) for test harness integration
- Automated Test Scheduling Functions
- Test result export
- Embedded multi-user client/server architecture
- Large-scale Load Solution supporting signaling and media
- Hardware Optionality
  - 16 PCI Slots in Rackmount
  - 6 PCI Slots in Portable
  - Software only for PC
- Flexible Data Filtering engine
- Multi-protocol call trace
- Ladder Diagrams to display message flows
- Deep Protocol support H.323, SIP, SIP-T/SIP-I, Diameter, MGCP, Megaco, XCAP, HTTP, RTP, RTCP, SS7 (ISUP/TCAP/BICC/SIGTRAN), Base IP Protocols
- Codec Support T.38 (Fax over IP), AMR NB/WB, G.711, G.723, G.726, G.729, RFC 2833, H.263
- Wireshark import
- Intuitive user interface

Specifications

Hardware

Spectra2XL – the new high-performance Dual Core, Dual 2.0 Ghz Intel® Xeon® based Rackmount chassis option provides market leading load test capacity and element emulation capabilities to enable you to keep pace with growing market processing requirements and technological advancements.

Analysis

Large-Scale Load Solution can validate Network Signaling and Media Delivery at Maximum Stress Levels. A family of Wideband Trunking Interface (WTI) boards with OC-3, STM-1, DS3, T1/E1 and Gigabit Ethernet interfaces works in combination with Spectra2 software to deliver a state-of-the-load generation tool.

Conformance Test Suites for VoIP and IMS protocols are aligned with the leading standards organizations in VoIP development: ETSI, IETF, CableLabs.

Powerful Filtering Capabiliites provide for Multi-Protocol Call Traces (**MPCT**) coupled with the ability to sift through data quickly and effectively.

Automation and Remote Operation

Spectra2 API (Application Programming Interface) lets users run tests and save the results of those tests from a remote system. The Spectra2 API further automates the lab testing function and leverages the value of Spectra2 by providing a platform independent method for remotely accessing Spectra2 from a Windows or UNIX-based system.

Conditional Branching support enables users to handle conditional scripting options such as If/Then/Else functionality.

Technologies

IMS Support - Spectra2 offers extensive SIP, Diameter protocol support for funcation and load testing at the core of the IMS network.

Support for BICC (Bearer Independent Call Control) testing with associated RTP media for true converged network testing. Spectra2 supports BICC call models in the Spectra2 Monitor, Tester and Generator applications. Users can inject and detect media in conjunction with BICC-based call models.

TCAP Monitoring and TCAP Generation support to monitor SCCP/TCAP nodes, interfaces, and traffic. View PDU contents, validate basic protocol functionality, and track communication between PSTN network elements. Spectra2's multi-protocol testing capability combined with an easy-to-use GUI and multi-user capability makes the TCAP Generation application the leading load solution for converged networks.

M3UA Transport for TCAP and ISUP lets users test application-level interfaces running over M3UA transport. Test multiple types of Sigtran elements and applications from one test tool.

Test Video Telephony using Spectra2 Monitor/Capture, Tester, and Generator. Support for SIP, H.263, H.263+ and Passive Video QoS testing.

Get/Put Extensions. Provide powerful pattern identification and matching functionality to extract data from incoming messages and insert in outgoing messages.

SIP User Agent (UA) Profiles allow Spectra2 users more control and customization of the attributes assigned to end-users.

SIP Torture Test Messages (IETF RFC 4475) provide the ability to "negative" test your SIP network.

Transport Layer Security (TLS) support in the SIP Tester, SIP Generator, and Capture applications lets users configure TLS properties and capture TLS testing results.

RFC 2833 Support RFC 2833 support enables Spectra2 to test and generate in networks that support the method defined by RFC 2833 for carrying DTMF (Dual Tone Multi Frequency) digits in RTP packets. Spectra2's media testing capabilities allow users to verify voice paths and measure QoS within both the Tester and Generator applications.

Multi-Gateway Support for Megaco and MGCP Spectra2 can emulate a large number of very small Media Gateways. This allows Spectra2 to support load testing of Media Gateway Controllers responsible for Customer premise equipment such as Multimedia Terminal Adapters, Integrated Access Devices, or residential gateways.

Generate, test and monitor SS7 ISUP interactions between packet and circuit networks from a single Spectra2 test solution for true integration of PSTN and VoIP testing.

Perform ISDN monitoring and load testing on the legacy interfaces of Media Gateway Controllers (MGCs) and Media Gateways (MGs), as we as ISDN Trunk Testing.

Benefits & Features

Characteristics		
	Portable Chassis	Rackmount Chassis
Slots:	6 PCI	16 PCI
Operating System:	Windows XP	Windows XP
Monitor	Flat Panel 35.8 cm (14.1 in.) XGA TFT	Optional
Power	110-220 VAC	110-220 VAC 48 VDC Available

Physical Characteristics / Dimensions				
	Portable Chassis		Rackmount Chassis	
Dimensions	**cm**	**in.**	**cm**	**in.**
Height	27	10.6	26.5	10.5
Width	41	16.1	43.26	17
Depth	25	9.8	46	18
Weight	**kg**	**lbs.**	**kg**	**lbs.**
Net	9.5	21	22.7	50.5

Spectra2 Packages

- VoIP Analyzer
- FoIP (Fax over IP) Testing Package
- PSTN Analyzer
- ISUP Testing
- ISUP / TCAP Decodes
- SIP Testing and Generation
- SIP/TLS Testing
- SIP-T Testing
- H.323 Testing and Generation
- MGCP Testing and Generation
- Megaco Testing and Generation
- Binary Megaco Testing
- Multi-Gateway Support for Megaco and MGCP
- Media Testing
- Voice Quality Testing
- Passive Voice Quality Testing
- RFC 2833 Testing
- Historical Statistics
- Application Programming Interface (API)
- Japan ISUP Testing
- BICC Testing
- TCAP Generator
- M3UA Support for ISUP and TCAP
- Diameter Generator Package
- Diameter Cx/Dx Interface Support
- Diameter Sh Interface Support
- ISDN Generator Package
- H.263 Video Testing Package
- Passive Video QoS Testing Package

Test Suites & Protocol Support

Test Suites

H.323

- Terminal/GateKeeper based on ETSI TIPHON TS 101 804 (H.225.0)
- Originating/Terminating Endpoint based on ETSI TIPHON TS 101 890 (H.245)

SIP

- User Agent, Proxy, Registrar, Redirect Server based on ETSI TIPHON TS 102 027

MGCP

Media Gateway Controller, Media Gateway based on:

- PacketCable TGCP-MG-CTP PKT-CTP-TGCP-MGD08-030103
- PacketCable TGCP MGC and Call Flows CTP PKT-CTP-TGCP-MGC-CF-D05-030103
- Megaco/H.248–
  Media Gateway Controller, Media Gateway based on ETSI TIPHON TS 101 889

SS7 ISUP

ISUP Call Processing based on:

- ITU-T Q.784.1, July 1996
- ITU-T Q.785.2, March 1999
- ANSI T1.236-2000, May 2000
- ETSI EN 300 356-35 v.3.1.2, September 2000
- ETSI EN 300 356-32 v.3.0.4, September 2000

Protocol Support

H.323 (Standards for multimedia communications over Local Area Networks)

- ITU-T H.323 Version 2, February 1998
- ITU-T H.323 Version 3, September 1999
- ITU-T H.323 Version 4, November 2000
- ITU Implementer's Guides July 1999, March 2000, December 2000, October 2002

SIP

- IETF RFC 2246 (TLS Protocol)
- IETF RFC 2543 (SIP: Session Initiation Protocol)
- IETF RFC 2976 (SIP INFO Method)
- IETF RFC 3261 (SIP: Session Initiation Protocol)
- IETF RFC 3262 (Reliability of Provisional Responses in SIP)
- IETF RFC 3264 (An Offer/Answer Model with the Session Description Protocol (SDP))
- IETF RFC 3265 (SIP-Specific Event Notification)
- IETF RFC 3268 (AES Cipher suites for TLS)
- IETF RFC 3310 (Hypertext Transfer Protocol (HTTP) Digest Authentication Using Authentication and Key Agreement (AKA))
- IETF RFC 3311 (SIP UPDATE Method)
- IETF RFC 3323 (Privacy Mechanism for SIP)
- IETF RFC 3325 (SIP Asserted Identity)
- IETF RFC 3326 (Reason Header Field for SIP)
- IETF RFC 3428 (SIP Message Extension)
- IETF RFC 3515 (SIP Refer Method)
- IETF RFC 3546 (Transport Layer Security (TLS) Extensions)
- IETF RFC 3903 (SIP: Session Initiation Protocol Extensions)
- IETF RFC 4168 (Stream Control Transmission Protocol (SCTP))
- IETF RFC 4475 (Session Initiation Protocol (SIP) Torture Test Messages)

SIP-T

- IETF RFC 2046 (Multipurpose Internet Mail Extensions (MIME) Part Two: Media Types)
- IETF RFC 3204 (MIME media types for ISUP and QSIG Objects)
- IETF RFC 3372 (Session Initiation Protocol for Telephones (SIP-T): Context and Architectures)
- IETF RFC 3398 (ISUP to SIP Mapping)
- IETF RFC 3578 (ISUP Overlap Signaling to SIP)

Test Suites & Protocol Support

Diameter

- IETF RFC 3588 (Diameter Based Protocol)
- (3GPP) ETSI TS 129.228 v.7.0.0
- (3GPP) ETSI TS 129.229 v.6.7.0
- (3GPP) ETSI TS 129.328 v.6.8.0
- (3GPP) ETSI TS 129.329 v.6.6.0

MGCP

- IETF RFC 2705 (Media Gateway Control Protocol (MGCP))
- IETF RFC 3435 (MGCP 1.0)

Packet Cable

- PKT-SP-TGCP-I01-991201
- PKT-SP-EC-MGCP-I03-010620

Megaco/H.248 (Binary and Text Encoding)

- IETF RFC 3015 (Megaco Protocol Version 1.0)
- IETF RFC 3525 (Gateway Control Protocol)
- ITU-T H.248, June 2000
- ITU-T H.248.1, March 2002
- ITU-T H.248.1, May 2002
- ITU-T H.248.1 v2 Corrigendum 1, March 2004

Multi-Protocol Label Switching (MPLS)

- IETF RFC 3032 (MPLS Label Stack Encoding)

SS7 ISUP

- ANSI T1.113-2000, August 2001
- ITU-T Q.763, December 1999
- Addendum 1, 2000
- Corrigendum 1, July 2001
- ETSI EN 300-356-1, August 1998
- ETSI ES 201 296 v1.1.1, July 1998
- ETSI ES 201 296 v.1.1.2, September 1998
- Ministry of Posts and Telecommunications of the People's Republic of China,
- Technical Specification of ISUP, 1996
- Japan ISUP
- NTT/TTC JT-Q.701 - 704, April 1992
- NTT/TTC JT-Q.707, November 1990
- NTT/TTC JT-Q.761 - 764, November 1999
- NTT/TTC JT-Q.850, November 1996
- Brazil ISUP
- ISUP 220.250.732, August 1996
- UK ISUP
- PD 6623:2000, PNO-ISC Specification Number 007
- ISDN User Part BSI, July 2000
- Hong Kong ISUP
- Singapore ISUP
- HKTA 2202, Issue 3, August 2001
- Israel ISUP
- Technical Requirement Specification for Signaling System No. 7 ISDN User Part (ISUP) in BEZEQ's Network for the national interface (1993)

ISDN

- Q.921
- Q.931
- Q.932
- Q.951
- Q.952
- Q.953
- Q.957
- EN 300 403-1 v 1.3.2
- EN 300 196-1 v 1.3.2
- EN 300 207-1
- ETS 300 286-1
- ETS 300 058-1
- ETS 300 093-1
- ETS 300 092-1

M3UA Transport

- IETF RFC 3332 (SS7 MTP3-User Adaptation Layer)

SCCP Protocol Support

- ITU Q.711, March 2001
- ITU Q.712, July 1996
- ITU Q.713, July 1996
- ITU Q.714, May 2001
- ITU Q.715, July 1996
- ITU Q.716, March 1993
- ANSI T1.112, May 2000

TCAP Protocol Support

- ITU-Q.771, June 1997
- ITU-Q.772, June 1997
- ITU-Q.773, June 1997
- ITU-Q.774, June 1997
- ITU-Q.775, June 1997
- ANSI T1.114-2000, June 2000
- Motorola A+

Test Suites & Protocol Support

ETSI INCS2

- EN 301 140-1 V1.3.4 (1999-06)

AIN 0.2

- T1.660- 6/4/1998, GR-1299-CORE

CAMEL

- 3GPP TS 29.078 version 5.9.0 (2004-09)
- 3GPP TS 29.078 version 4.8.0 (2003-03)

IS-41E

- ANSI/TIA-41.000-E-2004, April 2004
- ANSI/TIA-41.500-E-2004, April 2004
- ANSI/TIA-41.510-E-2004, April 2004
- ANSI/TIA-41.511-E-2004, April 2004
- ANSI/TIA-41.520-E-2004, April 2004
- ANSI/TIA-41.540-E-2004, April 2004
- ANSI/TIA-41.550-E-2004, April 2004
- ANSI/TIA-41.551-E-2004, April 2004
- ANSI/TIA-41.590-E-2004, April 2004
- ANSI/TIA-41.700-E-2004, April 2004
- ANSI/TIA-41.790-E-2004, April 2004

UMTS MAP

- UMTS MAP 3GPP TS 29.002 v6.7.0 Rel. 6, September 2004

GSM MAP

- ETSI TS 100 974 v7.1.0 / GSM 09.02 v7.1.0 Rel. 98, August 1999

MEID

- TIA-928, August 2004
- TIA-928-1, October 2004
- 3GPP.S.R0048-A v.3.0, September 2004

IS-41D

- TIA/EIA/IS-J-STD-036 Rev.0, 2000
- TIA/EIA/IS-735, 1998
- TIA/EIA/IS-751, 1998
- TIA/EIA/IS-756, 1998
- TIA/EIA/IS-764, 1998
- TIA/EIA/IS-737, 1998

IS-771

- TIA/EIA/IS-771, 1999

GSM3 (GSM MAP)

- ETSI TS 100 974 v7.1.0/GSM 09.02 v7.1.0 Rel. 98, August 1999

PCS3 (GSM3 over ANSI)

- ETSI TS 100 974 v7.1.0 / GSM 09.02 v7.1.0 Rel. 98, August 1999

IS-634A

- TIA/EIA/IS-634, 1998

SCTP Protocol Support

- IETF RFC 2960 (Stream Control Transmission Protocol), 2000
- IETC RFC 3257(SCTP Applicability Statement), April 2002
- IETF RFC 3309 (Stream Control Transmission Protocol (SCTP) Checksum Change), 2002

BICC Protocol Support

- ITU-T Q. 765.5, 2004
- ITU-T Q.1902.1, 2001
- ITU-T Q.1902.2, 2001
- ITU-T Q.1902.3, 2001
- ITU-T Q.1902.4, 2001
- ITU-T Q.1902.5, 2001
- ITU-T Q.1902.6, 2001
- ITU-T Q.1950 (2002)
- ITU-T Q.1970, 2001
- ITU-T Q.1990, 2001
- ITU-T Q.2150.0, 2001
- ITU-T Q.2150.3, 2001
- ANSI T1.BICC.1-7, 2000
- ETSI EN 302 213, v.1.1.2, January 2004

Voice Media

- IETF RFC 2327 (SDP: Session Description Protocol)
- IETF RFC 2833 (RTP Payload for DTMF Digits, TelephonyTones and Telephony Signals)
- ETF RFC 3550 (RTP)
- IETF RFC 3551 (RTP A/V Profile)
- ITU-T G.729 Annex A, November 1996
- ITU-T G.723.1, March 1996

Test Suites & Protocol Support

Voice Media (cont'd)

- ITU-G.711, November 1998
- ITU-T G.726
- AMR-NB
- AMR-WB

Voice Quality

- ITU-T P.862, February 2001
- ITU-T G.107, March 2003

Video Telephony

- ITU-T H.263 / H.263+
- IETF RFC 2429 (H.263+)
- IETF RFC 3261 (SIP: Session Initiation Protocol)
- IETF RFC 2327 (SDP: Session Description Protocol)
- IETF RFC 3550 (RTP)
- IETF RFC 3551 (RTP A/V Profile)
- Microsoft AVI file format - Audio Video Interleaved

Interfaces

- Signaling and Trunk Interface Circuit Card (STI)
  - 10/100BaseT Ethernet
  - DS3
  - Quad DS1/E1
  - H.100 bus to DSP Resource
- DSP Resource
  - H.100 bus interface to IMT Resource
  - PCI interface to host 8 DSPs per Card
- Signaling Network Interface (SNI) version 3
  Spectra "POD" Interface supports:
  - RS-449
  - V.35
  - T1/E1
  - M20
  - DSO-A
  - HSL and LSL SS7
  - Sigtran
  - ISDN
- Wideband Trunk Interface (WTI)
  - WTI OC-3 or STM-1
    - 2,016 channels per board
    - Supports simultaneous TDM media
  - WTI RTP
    - Supports 4,000 simultaneous RTP streams with media per board
    - Electrical Gigabit Ethernet interface
  - WTI for Signaling
    - VoIP signaling with RTP analysis
    - Gigabit Ethernet interface
  - WTI DS3
    - Media Large-Scale Load Solution
    - DS3 interface
    - DS3 trunk testing
    - 2,016 simultaneous calls with media, per WTI DS3 board
  - WTI T1/E1
    - 192 (T1) or 240 (E1) simultaneous calls per card
    - Scales to 6 boards for a total of 1,152 (T1) or 1,440 (E1) timeslots per system

For Further Information

Tektronix maintains a comprehensive, constantly expanding collection of application notes, technical briefs and other resources to help engineers working on the cutting edge of technology.

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