SONET/SDH VCAT

SONET/SDH networks have been deployed and heavily utilized for many years. These networks where designed for the efficient transport of DS0 voice circuits. Service providers, who have made large investments in SONET/SDH infrastructures, are seeking the means to support new services, such as Voice over IP (VOIP), IPTV and data. Virtual Concatenation (VCAT), Generic Framing Procedure (GFP) and Link Capacity Adjustment Scheme (LCAS) allow existing SONET/SDH networks to efficiently transport these new services.

Ixia provides a complete solution for Layer 2 through Layer 7 testing of SONET/SDH networks using its MSM2.5G1-01 and MSM10G1-02 load modules, including an optional VCAT solution (SW-VCAT-SONET). Using the VCAT option, Ixia’s SONET/SDH MSM modules can be configured to operate in Concatenated, Channelized or VCAT mode.

VCAT allows arbitrary grouping of VCAT members (STS1 or STS3c timeslots) to accommodate any bandwidth. This grouping of multiple VCAT members is defined as a VCAT circuit.

VCAT Overview

Up to 32 circuits can be configured on an Ixia port. Each circuit is compromised of a group of STS1 or STS3c members. The order and the mapping of the members is user defined. LCAS can optionally be enabled on each individual circuit. LCAS allows for the dynamic addition and removal of STS1 members needed to meet bandwidth requirements.

Each circuit can be customized to emulate a particular type of traffic. Circuit properties such as type of payload (GFP, PPP, HDLC, Frame Relay, etc), payload CRC, and overhead fields (C2 byte) can be defined per circuit. There are 512 transmit packet streams available to be allocated amongst the defined circuits.

Statistics are available on a per-port, per-circuit or per-member basis. Available statistics include transmit data counts and rates, receive data counts and rates, as well as SONET/SDH overhead information.

VCAT Configuration Options

- SONET and SDH modes supported
- Support for up to 32 circuits
- Configurable for STS1 (VC3), STS3c, STS12c and STS48c (STS48c available on MSM10G only) timeslots
- Symmetric or asymmetric configuration
- Enable LCAS on per-circuit basis
- User-defined member (timeslot) order
- Statistics on per-circuit, per-member and per-port basis
- Overhead error insertion capability
**LCAS Configuration Options**
- Based on ITU - G7042 specification
- Manual and automatic member insertion and removal
- User configured timeouts
- LCAS state trace messages
- LCAS enabled on a per-circuit basis
- LCAS state in statistic view

**GFP Configuration Options**
- Based on ITU - G7041 specification
- Frame based support
- Linear extension support
- Ability to turn Scramble on/off
- Ethernet and PPP payload
- User-defined GFP header fields
- Ability to corrupt PLI
- Single bit error correction capability

**VCAT Statistics**
A wide variety of statistics are collected on a per-circuit, per-member or per-port basis. The statistics provided include transmit data counts and rates, receive data counts and rates, as well as SONET/SDH overhead information.
Tcl API

Ixia’s VCAT enabled modules are supported by a comprehensive Tcl Application Programming Interface (API). This API allows users to develop custom scripts, and integrate the modules into automated test environments.

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Product Ordering Information

**945-0005 (SW-VCAT-SONET)**
Configuration Option, SONET Virtual Concatenation (VCAT) Option, License per port; Includes support for LCAS and GFP-F protocols; REQUIRES Purchase of a supported load module [see 945-0003 (MSM2.5G1-01), or 944-0012 (MSM10G1-02)].

**945-0003 (MSM2.5G1-01)**
1-port, 2.5 Gigabit Universal Multi-Services Module supporting OC-48c POS with SFP-pluggable interface. Full featured with 1 GHz PowerPC and 512 MB RAM. Does not include SFP transceiver.
**944-0012 (MSM10G1-02)**

1-port, 10 Gigabit Universal Multi-Services Module supporting 10GE LAN, 10GE WAN, and OC-192c POS with XFP-pluggable interface. Full featured with 1 GHz PowerPC and 512 MB RAM. Includes 10GE LAN/WAN operation. Does not include XFP transceiver.

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