Viscount x4T/x4TB/x4S Overview

Xtramus's multi-G Viscount x4T/x4TB/x4S test card delivers an extraordinary, complete, affordable layer 2~3 test solution. As a powerful Ethernet test card, Viscount x4T/x4TB/x4S supports multi-user operation, multi-stream traffic, and different kinds of frames/packets of almost any required protocol headers, tags and payload.

Viscount x4T/x4TB/x4S is perfect for the high port density environment, like test lab, QA, and system test applications, supporting the highest port scalability, virtual scalability and protocol coverage.

Specifically designed for NuStreams chassis, Viscount x4T/x4TB/x4S modules supports hot swap, multi-user operation, and Rapid- Matrix, a technology that can generate multi-stream traffic simultaneously with different kinds of frames/packets with almost any required protocol headers, tags and payload for each port.

Viscount x4T/x4TB/x4S is classified in the Xtramus' Lord Series of test cards. Lord Series is the fourth generation of cards developed by Xtramus, featured by faster speed and more streams generation ability per port.

Combined with the new NuStreams chassis, Viscount x4T/x4TB/x4S can perform synchronized tests to ensure the test precision. Also, the time consumed for all DUTs' multi-task testing will be shortened dramatically.

Along with the advanced technology mentioned above, Xtramus also provides several RFC-2544, RFC-2889, RFC-3918 test suits adaptable for this card, such as NuApps-RFC, NuApps -Packages and so on. Xtramus' Lord series can test the network equipments in conformance, performance and stress tests.

KEY FEATURES

- Support **10G/5G/2.5G/1G/100Mbps(Full Duplex only)** Ethernet test equipment
- Stream based wire-speed layer 2~3 traffic generation
- Wirespeed hardware based traffic generation and analysis
- More streams generation ability, up to 256 streams per port
- Extensive header variation and expanded random packet length
- RFC 2544/2889/3918 test suite
- High-precision performance measurement of throughput, latency, loss, sequence and mis-ordering error
- Remote management of testpoints
- Real-time statistics for each port, including transmitted/received frames for VLAN, IPv4, IPv4 fragment, IPv4 extension , ICMP, ARP, total bytes/packets, CRC, IPCS error, over size and under size frames

MAIN APPLICATIONS

Layer 2/3 Multi-Stream Testing Traffic

Control Command

Testing Data
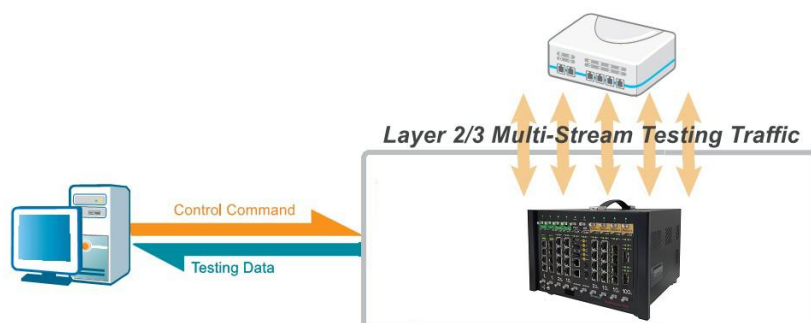
- ➤ Test cards for Ethernet device.
- ➤ Test cards for network device quality control in mass production line.
- ➤ Test cards used in R&D laboratory for new product design

SPECIFICATION

Model	Viscount x4T	Viscount x4TB	Viscount x4S
PHY	Marvell	Broadcom	Marvell
Interface	4 Multi-G RJ45 ports	4 Multi-G RJ45 ports	4 SFP+/SFP ports
Speed & Mode	10G/5G/2.5G/1G/100Mbps(Full Duplex only)	10G/5G/2.5G/1G/100Mbps(Full Duplex only)	10G/5G/2.5G/1Gbps
Frame Length	Tx Packet Length: 64 ~ 16Kbytes		
Payload	• **Burst Mode:** User-defined pattern, User-defined raw data, Random • **Rapid-Matrix Mode:** User-defined pattern: Byte Increase/Decrease, Word Increase/Decrease, 32'0 32'1, 64'0 64'1, Random. (Bit is presented by 0 or 1. 8'0 means 8-bit 0, 8'1 means 8-bit 1.)		
Data Integrity/ Sequence	• Standard CRC check • Sequence miss check and frame loss checked by X-TAG		
Error Packet Generation	CRC (Good/Bad/None), Undersize, Oversize, Alignment Error, Dribble Error, IP Checksum Error		

Hardware Counters	Port-based Statistics Counters		
	Tx Counters per Port	Frame Count, Byte Count, Pause Frame Count, Collisions, Single Collision, Multiple Collision, Excess Collision, Tx ARP/ICMP Request/Reply	
	Rx Counters per Port	Valid Rx Frame Count, Valid Rx Byte Count, Broadcast Frame Count, Multicast Frame Count, Unicast Frame Count, Pause Frame Count, VLAN Tagged Frame Count, IPv4 Frame Count, Rx ARP/ICMP Request/Reply, RMON counters, Alignment Error, Dribble Error, Undersize, Oversize, CRC Error, Data Integrity Error, IP Checksum Errors	
	Tx/Rx Rate Counter	Tx/Rx Packet Rate, Tx/Rx Line Rate, Tx/Rx Utilization	

| Streams Counter	**Advanced Stream-based Statistics Counters:** • Tx Stream Counter Set: up to 256 sets • Tx Counters per Stream: Frame Count, Byte Count • Rx Stream Counter Set: 1 group of 256 sets USC (Universal Stream Counter) per port • Rx Counters per Stream: Frame Count, Byte Count, Frame Loss, Sequence Miss, IP Checksum Error, Latency USC (Universal Stream Counter) are packet filtering rules based on: ➢ DA(Destination Address) ➢ MPLS ➢ Destination Port ➢ SA (Source Address) ➢ Destination IP ➢ Source Port ➢ VID (VLAN ID) ➢ Source IP ➢ VLAN CoS (Class of Service)
Capture Criteria	SDFR (Self-Discover Filtering Rules) technique is able to capture packets by different criteria in either a unique value or a range of values by user-friendly UI. • MAC Layer Event • SDFR Pattern (set) • Network Layer Event • 2nd level CRC
Transmit Mode	• Single Mode • Burst Mode • Continuous Mode • Transmitting-by-time Mode
Software Support	• **NuWIN-RM:** Virtual Control Suit for NuStreams Chassis • **NuApps-MultiUnits-RM:** Simultaneously testing multi DUTs in mass production • **NuApps-RFC:** Test suit include RFC 2544, RFC 2889 and RFC 3918 test • **NuApps-Packages:** Test suit include BERT and NRTT (more test item will be added) • **NuApps-MFG:** Complete multi-DUT mass production testing suit
Miscellaneous	• Support cross-card latency test • Support global command • Different ports can be shared by different users • Support jumbo frame • Support hot swap

TECHNICAL TERMS

Rapid-Matrix

Rapid-Matrix, specifically designed for generating multi-stream traffic per port simultaneously, is used to verify functions and performance of Ethernet devices/solutions /networks.

Features & Advantages

- **Generate up to 256 Streams Per Port**

Rapid-Matrix consists of 256 individual entries for each port. Each entry has independent settings for a unique data stream. Multiple entries can be correlated to compose a complicated data streams.
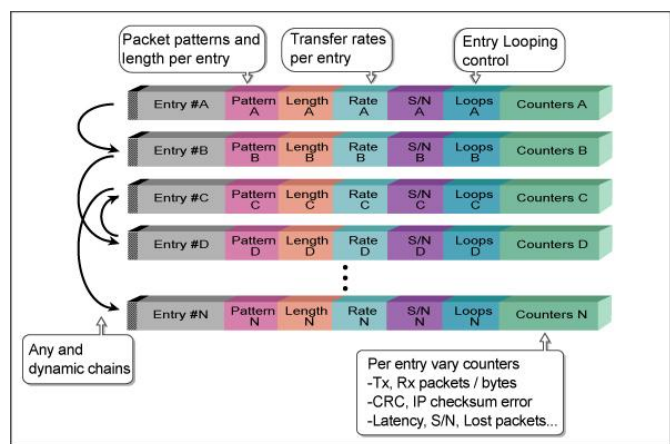
- **Flexible/Versatile Protocol Support**

Rapid-Matrix supports various network protocol headers/ tags defined based on testing requirements in order to create multi-stream testing traffic.

- **Flexible Packet Length and User Define Pattern**

In order to meet advanced/complex testing requirements, jumbo frames are also supported by Rapid-Matrix for packet generation.

The packet length generated by the same Rapid-Matrix entry can range from 48 bytes to 16K bytes. Other than defined headers/ tags, the rest of packet is filled up with selected patterns based on testing requirements.

- **Configuring Settings Online Dynamically**

All settings regarding to Rapid-Matrix entries can be changed under Rapid-Matrix's transmission mode. Therefore, it is possible to modify bandwidth and traffic simultaneously during transmitting.

- **Dynamic Multi-stream Traffic Generation**

In real network traffic, different data streams' packet sequence is changing dynamically. In other words, each data stream's loading is a very important factor to be managed in order to verify the function/ performance of DUT.

The module card generates dynamic variations of test traffic, and each stream's bandwidth can be controlled individually based on testing requirements.

- **Transmission Statistics per Entry**

For generating multi-stream traffic, information regarding to statistics in every stream is very important. Rapid-Matrix supports the following statistics functions per entry:

- ➢ Total transmitted packet count
- ➢ Total transmitted byte
- ➢ Transmitting packet rate (packets/sec.)
- ➢ Transmitting byte rate (bytes/sec.)

Comparing statistics regarding to packets generated by Rapid-Matrix and statistics from receiving ports can help users analyzing how DUT handles the multi-stream traffic.

SDFR

SDFR (Self-Discover Filtering Rules) is a technology that makes capturing or filtering over Ethernet easy and convenient.

- ➢ User- friendly interface that display values such as source IP, destination IP and other criteria for filtering. All these values can be input directly without calculating mask.
- ➢ SDFR value for capture or filter includes several network protocols (such as TCP, UDP, FTP, OSFP…), various frame length (oversize, undersize), and various frame/packet types (CRC error, IP checksum error…).
- ➢ SDFR values can be a single value or a range of values between specified values. All packets that fit the value will be captured.
- ➢ Multiple filter condition can be activated easily simply by clicking different options.
- ➢ Displaying captured packet in real-time while the network is still running.
- ➢ Value of SDFR and filter condition can be changed dynamically during capture procedure.

RxHost

RxHost: Smart Function for receiving packet.

➢ Received packets are divided into different priorities for different buffers. MyMAC packets with destination addresses have higher priority on the receiving side.

➢ Incoming packets are stored in separated buffer so the system can keep receiving important packets (such as ARP, Ping, and etc.) even the buffer itself is overflowed with broadcast packets.

➢ Received packets can be captured for applications or stored in buffer for other purposes at the same time.
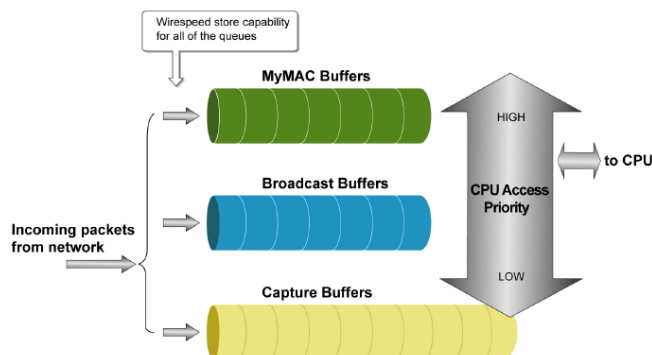
Streams Counter

This counter is the statistics of multi-stream traffic. Counters for each individual stream in a single port are very essential data to analyze performances of DUT's multi-stream traffic. The streams counters are based on X-TAG and VLAN for each port. The system shows its related counters (such as Packet counts, Bytes, S/N Error, Packet Loss, Latency and Transmission Rate (Mbps)) as illustrated below.

X-TAG Streams Counter

Transmitting Side

Transmit Streams	Packets	Bytes
N'	2,445	500,991
N'+1	90,343	7,103,151
N'+2	88,672	8,092,043
....		

Receiving side

Received Streams	Packets	Bytes	S/N Error	Packet Loss	Source port information	Latency	Rate (Mbps)
N'	9,320	710,573	13	0	Slot=2 Port=1	3.2 us	1.3
N'+1	41,117	5,900,988	3	1	Slot=8 Port=1	4.5 us	17.2
N'+2	15,095	18,678,003	87	21	Slot=9 Port=2	4.4 us	25.8
....							

Features & Advantages

➢ **Wirespeed Performance:**

The performance of Multi-stream Counter can support up to wirespeed (100% utilization of 10 Gigabit Ethernet traffic). Receiving frames are processed in real time.

➢ **Flexible Protocols Support:**

Several often-used protocols (like VLAN ID) are served as pre-defined patterns for Multi-stream Counter's trigger conditions. Multi-stream Counter also supports user-defined patterns by SDFR. Proprietary protocols or private headers/ tags can also be triggered by Multi-stream Counter based on user- SDFR.

➢ **Pre-filtering to Trigger Designated Packets:**

Multi-stream Counter can correlate with filtering. Incoming packets will be filtered first. Only packets meet filtering settings are forwarded to Multi-stream Counter. Filtering options are very flexible in order to meet different testing requirements. Several default parameters are available for frequently-used protocols such as IPv4 and etc. User defined triggers are also supported for custom testing requirements

Features & Advantages of X-TAG Stream Counter:

➢ **Real-Time Hardware-generated Statistics:**

All statistics are provided by hardware instead of software, making real-time network statistics possible.

➢ **Real-time Statistics for Individual Stream:**

The information provided by X-TAG SC is real-time statistics for the target data streams. Instead of getting the final statistics at the end of the test, X-TAG SC is capable of providing real-time statistics of individual stream for each port in every second during testing process. This feature helps when analyzing any dynamic changes of target data streams.

➢ **Sequence Miss and Packet Loss Check:**

Sequence number is embedded in X-TAG generated by Rapid-Matrix. X-TAG SC uses this to check any sequence miss or packet loss occurrences for each individual stream.

➢ **Latency Measurement:**

X-TAG SC can analyze data carried by X-TAG in the receiving frames of designated data streams for Latency Measurement.

CHASSIS SUPPORTED

The Lord Series are specifically designed to support NuStreams-900.

NuStreams-900 Chassis

- **Slot:**

8-slot for test cards

- **Power:**

AC 90~240V

- **Management Card & Speed:**

MGM-3s3A:RJ-45 10/100/1000 Mbps x 2

- **Dimensions:**

22.3 cm (W) * 25.9 cm (D) * 18.6 cm (H)

CONTACT INFORMATION

Website: http://www.xtramus.com
E-mail: Sales@xtramus.com (for Product Inquiry)
　　　　TS@xtramus.com (for Technical Support)
TEL: +886-2-8227-6611
FAX: +886-2-8227-6622