Wireless Throughput Testing

OVERVIEW

XM-RM7W1 & WAC-19 is a wireless functional testing suit by Xtramus, supporting IEEE 802.11ac protocol. Xtramus successfully converts the wireless traffic to the experienced wired traffic testing technology. This solution brings benefits to our customers by providing a good way to ensure the quality of their WiFi products.

XM-RM7W1 belongs to Xtramus's flexible, reliable and highly accurate XM-RM series. Like other XM-RM series cards, XM-RM7W1 needs to be used on the NuStreams chassis platform, supporting hot plug and multi-user. The Rapid-Matrix technology is able to generate Ethernet packets with different headers, labels and headers etc. on each port.

WAC-19 is an assisting test router used together with the XM-RM7W1 card, to stably convert the wired traffic to the wireless traffic. WAC-19 is employs MIMO 3*3:3 transmission mode and supports 802.11a/b/g/n/ac. Its maximum transmission rate is 1900Mbps (due to rate limitation, the practically measured maximum bandwidth is 1000Mbps).

°

WAC-19

FEATURES

➢ Supports IEEE 802.11 b/g/n 2.4GHz + 256 QAM, the measured rate up to 600Mbps

➢ Supports IEEE 802.11 a/n/ac 5.0GHz, the measured rate up to 1000Mbps

➢ WPA/WPA2—PSK and WEP encryption

➢ Supports 10/100/1000 Mbps Ethernet device testing

➢ Wire speed generation and testing

➢ High performance, low cost

➢ Tests 4 DUTs at one time

➢ Supports automatically acquire/scan/fixed SSID

➢ Realizes the integration testing of the wired and wireless traffic testing of the DUT

➢ Multiple functional estimates, throughput, packet loss, rate, etc.

➢ Real-time data statistics per port

➢ Supports DUT communication and control through Telnet

MAIN APPLICATIONS

➢ Wireless traffic testing

➢ Wired traffic testing

➢ Test the wireless & wired traffic simultaneously

➢ NAT protocol testing
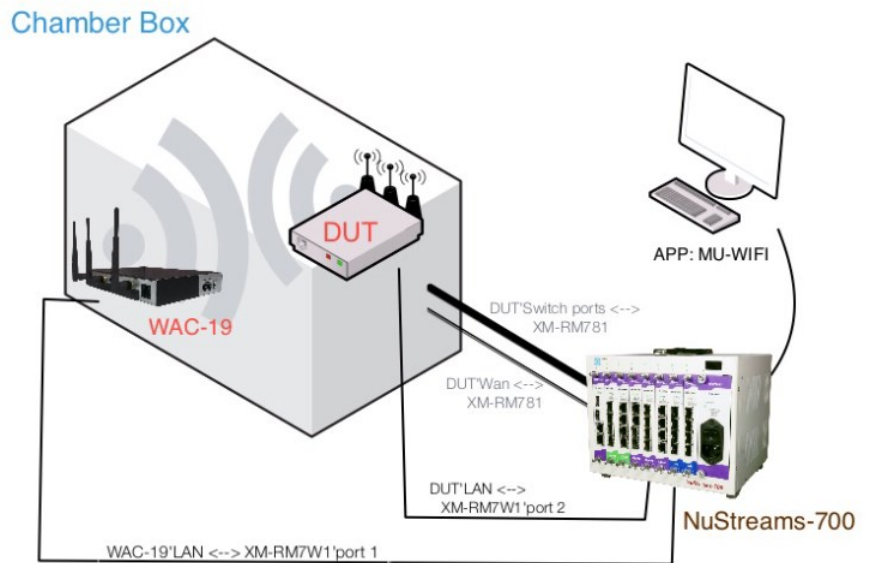
NuApps-MultiUnits-WiFi

NuApps-MultiUnits-WiFi is the joint wireless transmission testing software, which can be used for the wireless throughput testing and the 2-layer forwarding efficiency testing. The software has 4 independent windows thus testing 4 wireless DUTs simultaneously so that the testing efficiency has been improved greatly.

SPECIFICATIONS

| Model	XM-RM7W1
Interface	● 1000BASE-TX: RJ45 x 2 ● Supports automatically negotiation/force mode, 10/100 Mbps full/half duplex and 1000Mbps full duplex
Frame Length	Tx Packet Length: 48 ~ 2Kbytes
Payload	● **Burst Mode:** User-defined pattern, User-defined raw data, Random ● **Rapid-Matrix Mode:** User-defined pattern: Byte Increase/Decrease, Word Increase/Decrease, 8'0 8'1, 16'0 16'1, 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	● 2nd level CRC check function independent from standard CRC ● Sequence miss check and frame loss check by X-TAG
BERT Test	Support Layer 2 BERT Test
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: 32 (2Kbytes) sets by Rapid Matrix, and supports up to 512 (128Byte) 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 ➢ MPLS ➢ Destination Port ➢ SA ➢ Destination IP ➢ Source Port ➢ VLAN ID ➢ Source IP ➢ VLAN CoS
Transmit Mode	● Single Mode ● Burst Mode ● Continuous Mode ● Transmitting-by-time Mode
Software Support	● **NuApps-MultiUnits-WiFi:** Multi-window wireless traffic test suit ● **NuCommander:** Hardware control (voltage, fan speed, and temperature) of NuStreams chassis
Miscellaneous	● Support cross-module 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 64 Streams Per Port**

Rapid-Matrix consists of 64 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.
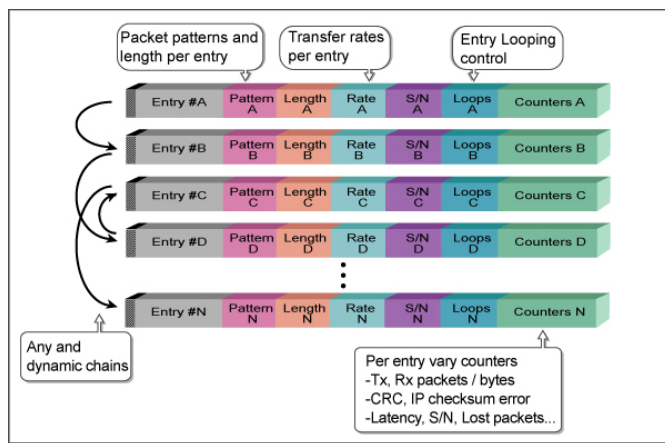
- **Flexible/Versatile Protocol Support**

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 2K 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.

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
......							

CHASSIS SUPPORTED

The Lord Series are specifically designed to support NuStreams-2000i, NuStreams-600i and NuStreams-700.

NuStreams-600i&
NuStreams-600i Lite

- **Slot:**
7-slot for test cards
- **Power:**
AC 90~240V
- **Management Card & Speed:**
XM-2S10:RJ-45 10/100 Mbps x 2
- **Dimensions:**
237 mm x 220 mm x 192 mm

NuStreams-2000i&
NuStreams-2000i Lite

- **Slot:**
16-slot for test cards, plus installed IPC
- **Power:**
AC 90~240V
- **Management Card & Speed:**
XM-2S19: RJ-45 10/100 Mbps x 2
XM-2S8G: RJ-45 10/100/1000 Mbps x 2
- **Dimensions:**
295 mm x 485 mm x 196 mm

NuStreams-700

- **Slot:**
7-slot for test cards
- **Power:**
AC 100~240V
- **Management Card & Speed:**
XM-3S3GS: RJ-45 10/100/1000 Mbps x 1
- **Dimensions:**
225 mm x 196 mm x 193 mm

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