Leaflet

In-service Measurement for Mobile Backhaul

- On-site Live Traffic Analysis
- On-site Disruption Time Measurement

MT9090A MU909060A1/A2/A3

Network Master Gigabit Ethernet module

Background

Portable devices using data communication such as web browsing, gaming and social networking, are becoming increasingly popular along with the global adoption of Smartphones, and the data traffic in mobile backhaul is growing dramatically. Moreover, video content distribution consuming huge amounts of bandwidth is expected to spread further in the future. As a result, the amount of data passing through the mobile backhaul is likely to nearly double every year. Mobile operators are taking various countermeasures to meet this challenge, such as introducing new technologies and strengthening the infrastructure, but it is uncertain whether there are adequate plans for a larger, unexpected traffic increase. In these circumstances, existing infrastructure must be used more efficiently and service quality must be improved to the user.

Anritsu's Network Master Gigabit Ethernet Module (NWM GigE) is an IP/Ethernet measuring instrument supporting on-site analysis of live networks. The small, portable, low-cost design makes it the ideal personal test solution for on-site engineers and technicians who can accurately and quickly troubleshoot problems or take preventive countermeasures.

Application 1
Live Traffic Scanning

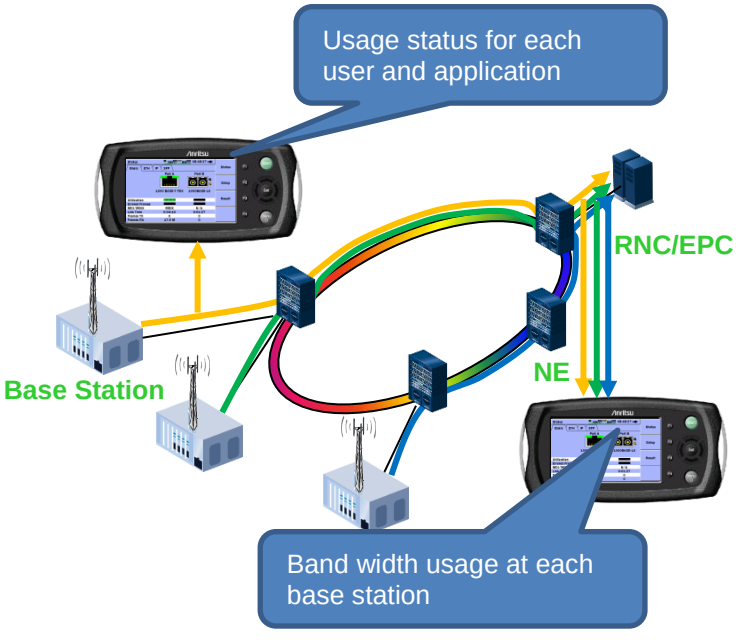
Understanding network traffic trends is the key to determine the causes of network faults and lowered performance. Packet capture has been commonly used for this application. However capturing traffic at the full line rate has traditionally required large desktop measuring instruments. That has been a problem when working on-site.

By simply installing the optional Channel Stats function in the NWM GigE, automatic live traffic scanning and analysis of traffic trends from various perspectives can be analyzed. Installation in the easy-to-carry NWM GigE makes it easy to understand traffic trends at each site on the Ethernet network.

Support for 33 key properties such as MAC/IP Address, VLAN ID, TCP/UDP Port Number, etc., with simultaneous selection of three key types offers field analysis of selected received live traffic. Frames with different values can be screened as separate channels, retrieving data on Bit, Frame, and Error Frame counts, as well as Length Distribution data for each channel.

Identification of each base station in the mobile backhaul requires analysis of many VLANs. Selecting the VLAN ID makes it possible to determine which base station is using many bands. In addition, Error counts and Length Distribution counters data can be used to find base stations with high proportions of short packets causing high network processing loads, and to find source hosts of Error frames causing degraded network performance.

Moreover, setting the IP address or the TCP/UDP port number makes it possible to find the usage status for each user and the application usage trend.



<Live Traffic Scanning using VLAN ID>

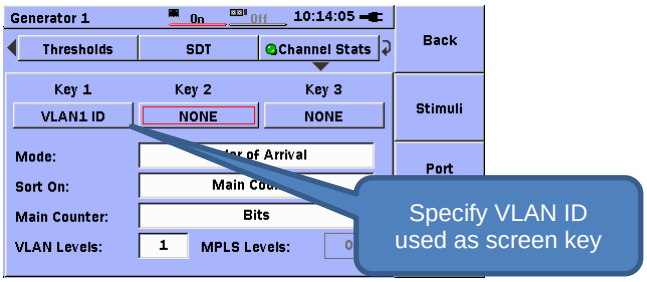


Fig-1. Setting Display

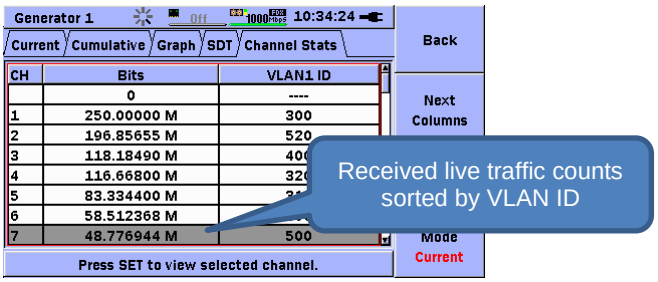


Fig-2. Summary Result Display

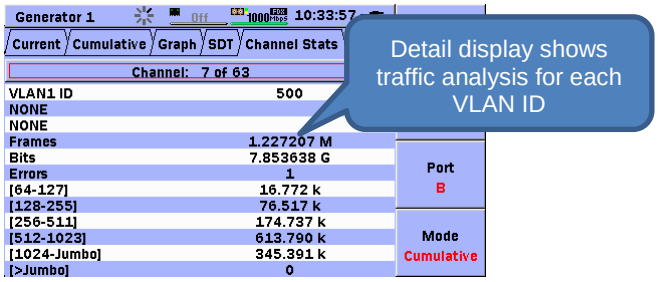


Fig-3. Detail Result Display

The Channel Stats function with up to 63 channels is perfectly tailored for short-term Live Traffic Scanning, but sometimes 63 channels are inadequate for long-term monitoring because live traffic trends are changing. In addition to the Order of Arrival mode for received live traffic, the Channel Stats option also has a Top Talker mode that clears channels with low receive rates periodically and captures new live traffic, supporting scanning without missing new heavy users that appear during long-term measurement.

Application 2
Service Disruption Time

In addition to measuring Throughput and Latency, network performance evaluation also requires monitoring of the important Availability parameter. The causes of network unavailability may be physical break down or switching between the logical network path, as well as short-term buffer overflows. These can take a few milli-seconds, several seconds or last hours.
On live networks, the Unavailable status can be detected by alarms from network devices, if the cause is physical link failure or break down, irrespective of whether the unavailability is long or short term.
However, it can be difficult to detect unavailability, especially in the short term, if the unavailability is caused by frame loss and not due to physical link failure or break down.
Since the expected future increase of video content applications on mobile networks with short-term frame distribution losses is likely to impact the quality of the user experience, measurement of the Unavailable status and time over short-term periods seems likely to become more important.
Using the Service Disruption Time measurement function of the NWM GigE to measure the live traffic frame distribution loss intervals and occurrences makes it possible to easily detect service disruptions when preset thresholds are exceeded. Moreover, these measurement results are directly related to service quality, and since it is important to measure as close as possible to the UNI (user network interface), the portability of the NWM GigE enables easy measurement at each base station.

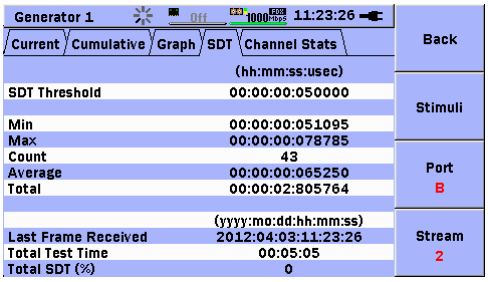


Fig-4. Service Disruption Time Result Display

Specifications

Channel Stats	
Key	Ethernet: MAC DST/MAC SRC VLAN: VLAN1 ALL/VLAN1 ID&PRI/VLAN1 ID/VLAN1 PRI VLAN2 ALL/VLAN2 ID&PRI/VLAN2 ID/VLAN2 PRI VLAN3 ALL/VLAN3 ID&PRI/VLAN3 ID/VLAN3 PRI MPLS: MPLS1 LBL&CoS/MPLS1 LBL/MPLS1 CoS MPLS2 LBL&CoS/MPLS2 LBL/MPLS2 CoS MPLS3 LBL&CoS/MPLS3 LBL/MPLS3 CoS IP: IPv4 DST/IPv4 SRC/IPv4 QoS&PROT/IPv4 QoS/IPv4 PROT IPv6 QoS&HDR/IPv6 QoS/IPv6 HDR TCP/UDP: DST PORT/SRC PORT
Selectable Keys	3 max
Mode	Order of Arrival/Top Talker
Channel	Up to 63 unique channels and 1 overflow channel
Counter	Current/Cumulative Bit/Frame/Error/Size Distribution
Service Disruption Time	
Threshold	1 [us] to 23.59.59.999.999 [hour.min.sec.msec.usec]
Result	Min, Max, Average, Count, Total Time, Total SDT (%) and Last Frame Received (interval) Timestamp

Ordering Information

MT9090A	Main Frame
MU909060A1	Gigabit Ethernet Module (1 RJ45, 1 SFP)*
MU909060A2	Gigabit Ethernet Module (2 RJ45)*
MU909060A3	Gigabit Ethernet Module (2 SFP)*
MU909060A1/A2/A3-006	Channel Stats Option
Optical SFP	100BASE-FX/LX, 1000BASE-SX/LX/ZX
Electrical SFP	10/100/1000BASE-T

*Service Disruption Time is standard function

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