/Anritsu

Assured Service Quality

Traffic Impairment Emulator
MD1230B-17/MP1590B-17/MU159101A-17

MD1230B, MP1590B/91A
Data Quality Analyzer, Network Performance Tester

The rapid spread of triple-play, rich-content networks offering video, voice, and data services is driving demand for high QoS assurance across simple communication infrastructures as well as IP networks. Anritsu's MD1230B and MP1590B/91A are general-purpose IP testers that are ideal for assuring the quality of triple-play and next-generations networks (NGNs).

1. Background

Today's networks are used for diverse applications and are connected to many devices, including telephones, TVs, PCs, webcams, and game machines, However, because the network environment is always changing from moment to moment, assuring network QoS is the key to enabling stable application performance.

Service quality has a major impact on real-time applications such as voice over IP (VoIP) and video streaming (IPTV, IP Videoconferencing and VoD), and requires monitoring of:

- Error Rate
- Packet Loss
- Transfer Delay
- Delay Variation

For example, errors and lost packets cause voice dropouts and image glitches, while large transmission delays result in lag or echo between communicating parties. In addition, large delay fluctuations cause degraded voice and video. By comparison, services such as email and web browsing, which do not require real-time communications, are minimally impacted by network quality.

As a result, networks today are classified according to the quality level required to offer the contracted services and applications.
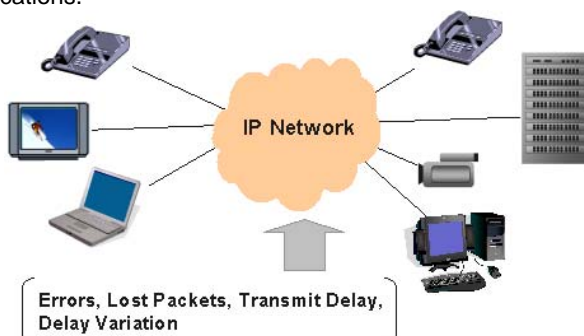

Fig. 1 Network Quality Parameters

2. Applications

Installing the Traffic Impairment Emulator (Option-17) enables the MD1230B or MP1590B/91A to emulate network faults such as packet loss, error/packet overwrite, transmission delay, and packet jitter using either the MU120121A 10/100/1000M Ethernet Module or the MU120122A Gigabit Ethernet Module.

Systematically varying the network quality level allows evaluation and verification of hypothetical services, even under constantly changing network conditions.

Quality Evaluation with Actual Traffic

Evaluating service quality levels requires using actual service content flowing on networks.

The MD1230B and MP1590B/91A Traffic Impairment Emulator option supports quality level evaluation by using a Through Function to add faults to actual service traffic.
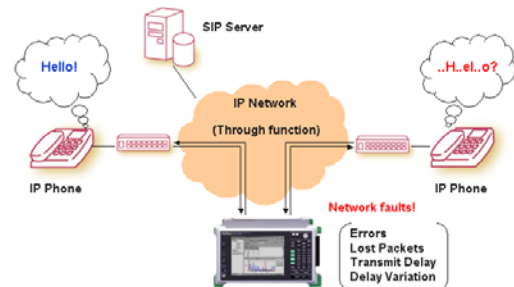

Fig. 2 VoIP System Service Quality Evaluation

VoIP services depend on high network quality with little or no transmission delay. The screen below shows an example of emulating a network that gives priority to VoIP traffic (70-ms transmission delay and 20-ms packet jitter). Using the MD1230B or MP1590B/91A to emulate a network with a specified quality level allows evaluation of service levels before network commissioning, helping to reduce testing costs.
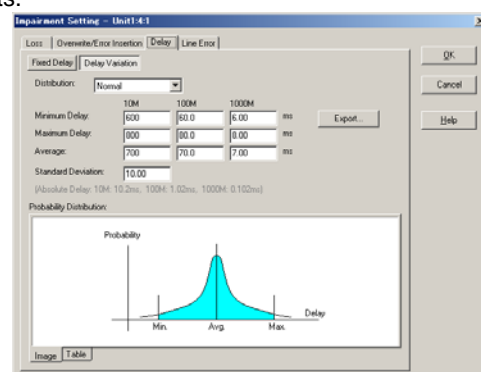
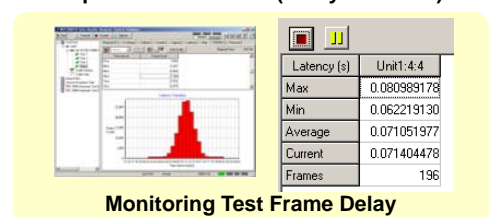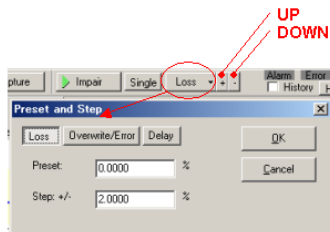**Traffic Impairment Emulator (Delay Insertion)**

Monitoring Test Frame Delay

Fig. 3 Delay Insertion

Verifying Service Limits

It is impossible to completely eliminate all network faults such as lost packets, errors, and delay. Although service terminal equipment is designed with QoS maintenance functions that compensate for some level of network faults, such equipment always has a fault tolerance limit.

The MD1230B and MP1590B/91A Traffic Impairment Emulator option allows gradually changing the fault level to determine the service operation limits.

Pressing the Up or Down buttons changes the network fault level gradually to determine the service network fault limits.

Fig. 4 Verifying Service Limits (UP/DOWN button)

3. Traffic Impairment Emulator Features

■ Emulating Network Faults
Lost packets, error/packet overwrite, or transmission delay/packet jitter can all be inserted either individually or together as a mixture of faults. In addition, filtering permits fault generation for a specific traffic flow.
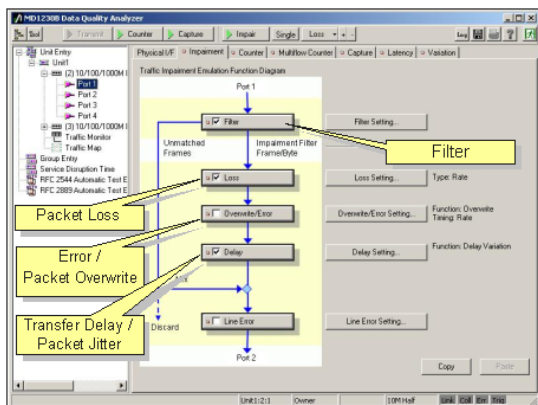

Fig. 5 Traffic Impairment Emulator Screen

■ Real-time Impairment Effects

■ 10/100/1000M Electrical Support
(using MU120121A)

■ 1000BASE-SX/LX/LE/LR Optical Support
(using MU120122A)

■ Hardware-based High Accuracy and High Repeatability

■ IPv4 and IPv6 Support

■ Emulation of Delays up to 50 s
For effective fault emulation up to real network system limits

■ Easy-to-Use GUI

■ Built-in packet generation/monitor function
In addition to the network fault generation function, the built-in packet generation and monitoring functions also enable one MD1230B or MP1590B/91A to inspect the entire network without preparing a server or network terminals.

■ Packet Analysis Using Capture Functions
This built-in capture function enables direct analysis of packet contents. Packet-level analysis helps troubleshoot the causes of network faults and diagnose overall system health.

■ Multiflow Traffic Monitoring Function
When used in combination with the MU120131A 10M/100M/1000M Ethernet Module or the MU120132A Gigabit Ethernet Module, up to 255 traffic flows can be monitored in real time. This can verify the operation of systems having separate QoS controls for each flow.

4. Composition and Specifications

Composition	Mainframe and Options:
	  MD1230B and MD1230B-17,
	  MP1590B and MP1590B-17,
	  MP1591A and MU159101A-17
	Plug-in Module:
	  MU120121A or MU120122A
	Software version:
	  Ver. 8.1 or later

MD1230B-17/MP1590B-17/MU159101A-17 Traffic Impairment Emulator	
Ports	Port 1 and Port 2
Filter	Pattern match at any specified field.

Error and Delay	Following faults added to filtered frames
	All faults processed at line speed
	· Delay (51.2 s max.) (*1)
	· Delay variation (Uniform/Normal/Exponential/User Defined)
	· Frame loss
	· Overwrite (Four locations max.)/Error
	*1: 50 s Range (10 Mbps bandwidth): 1 to 51200 ms (Step: 1 ms), ±25600 ns
	     5 s Range (100 Mbps bandwidth): 0.1 to 5120 ms (Step: 0.1 ms), ±2560 ns
	     500 ms Range (1000 Mbps bandwidth): 0.01 to 512 ms (Step: 0.01 ms), ±256 ns

Background	Unfiltered frames mixed with filtered frames or discarded (user selectable)
Supported Modules	MU120121A/22A

5. Ordering Information

➢ MD1230B MD1230B Data Quality Analyzer MD1230B-12 IPv6 Expansion(*1) MD1230B-17 Traffic Impairment Emulator MU120121A 10/100/1000M Ethernet Module MU120122A Gigabit Ethernet Module MU120131A 10/100/1000M Ethernet Module (*2) MU120132A Gigabit Ethernet Module (*2) ➢ MP1590B MP1590B Network Performance Tester MP1590B-12 IPv6 Expansion(*1) MP1590B-17 Traffic Impairment Emulator MU120121A 10/100/1000M Ethernet Module MU120122A Gigabit Ethernet Module MU120131A 10/100/1000M Ethernet Module (*2) MU120132A Gigabit Ethernet Module (*2)	➢ MP1591A MP1591A Network Performance Tester MU159101A-12 IPv6 Expansion(*1) MU159101A-17 Traffic Impairment Emulator MU120121A 10/100/1000M Ethernet Module MU120122A Gigabit Ethernet Module MU120131A 10/100/1000M Ethernet Module (*2) MU120132A Gigabit Ethernet Module (*2) *1: Requires MD1230B-12/MP1590B-12/MU159101A-12 IPv6 Expansion for IPv6 function *2: Requires MU120131A/132A for real-time monitoring of up to 255 traffic flows Notes: 1. The MD1230B-17/MP1590B-17/MU159101A-17 Traffic Impairment Emulator options are supported only by MU120121A/122A models shipped after March 7, 2008. 2. The MD1230B-17/MP1590B-17/MU159101A-17 Traffic Impairment Emulator is only supported by ports 1 and 2 of the MU120121A/122A.