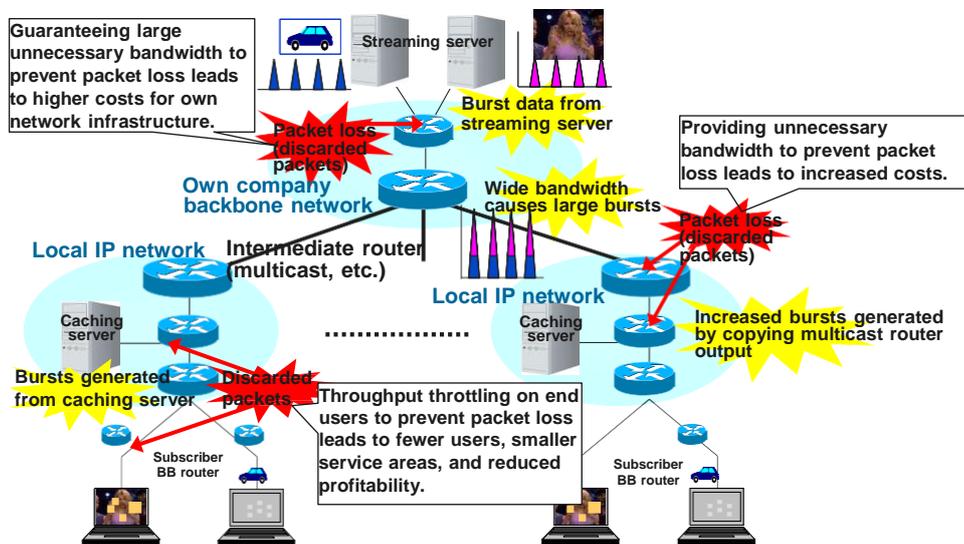**Anritsu**

Solutions for Burst Signal Measurements on Wide Area Streaming Networks

MD1230/MP1590 Family Application Traffic Monitor

Today's Ethernet-based streaming networks using burst traffic often suffer from Quality of Service (QoS) problems caused by data delays and overflows (packet loss) at routers, switches, and hubs. Accurate capture of burst data related to degraded service is a key part of network pre-commissioning design and troubleshooting. This application note introduces burst data measurements using the high-resolution measurement functions of the MD1230/MP1590 product family as an example of streaming distribution service evaluation and verification. It is just one of Anritsu's many solutions supporting Triple Play services.

Streaming Network Configuration

Guaranteeing large unnecessary bandwidth to prevent packet loss leads to higher costs for own network infrastructure.

Streaming server

Burst data from streaming server

Packet loss (discarded packets)

Own company backbone network

Providing unnecessary bandwidth to prevent packet loss leads to increased costs.

Wide bandwidth causes large bursts

Local IP network Intermediate router (multicast, etc.)

Packet loss (discarded packets)

Local IP network

Caching server

Caching server

Increased bursts generated by copying multicast router output

Bursts generated from caching server Discarded packets

Throughput throttling on end users to prevent packet loss leads to fewer users, smaller service areas, and reduced profitability.

Subscriber BB router

Subscriber BB router

Expensive and Limited Service Area Video Distribution Streaming Network

1. Introduction

High-definition (HD) video streaming services, such as VoD (Video on Demand) and IP-TV multicast streams, are becoming increasingly common. Guaranteed service quality (QoS) is a key element in these video-streaming services. Assured QoS requires pre-commissioning network design verification and fault troubleshooting to clarify the causes of and countermeasures to service problems.

2. Applications

Anritsu's MD1230 product family with Application Traffic Monitor software (Option-20) is the perfect solution to this problem because its 1-ms resolution offers oscilloscope-like display of all traffic in real time, supporting detailed but easy troubleshooting and fault analysis.
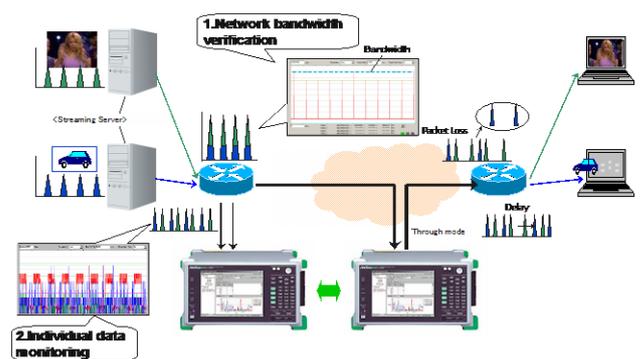

1.Network bandwidth verification

Bandwidth

Packet loss

<Streaming Server>

Delay

Through mode

2.Individual data monitoring

Fig. 1 Real-time burst measurement using MD1230B

As shown in the figure above, the MD1230A can capture and analyze data by connecting it to the router immediately downstream of the streaming server or to the network router where burst data is thought to be causing lost packets. Moreover, when the MD1230 is set to the Through Mode, it can be connected anywhere in the network to

capture and analyze data. Since the Application Traffic Monitor option measures in real time, it can capture and analyze data for both in-service and out-of-service networks.

<Measurement Example>

> ## Evaluating and Monitoring Each Streaming Server Application

Each type of streaming server uses a different method to send data as shown by the two figures below. If several data bursts are sent simultaneously using the maximum bandwidth in a short time period, the increased data amount can cause data overflow, resulting in lost packets. In particular, HD image burst data overloads routers so they cannot forward data.
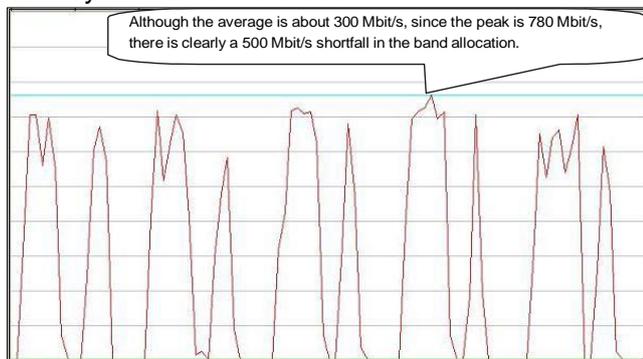

Although the average is about 300 Mbit/s, since the peak is 780 Mbit/s, there is clearly a 500 Mbit/s shortfall in the band allocation.

Fig. 2 Monitored VoD Server Stream

Since the peak is 430 Mbit/s, the required bandwidth is 500 Mbit/s but because the average is 60 Mbit/s, traffic shaping makes efficient use of the bandwidth.
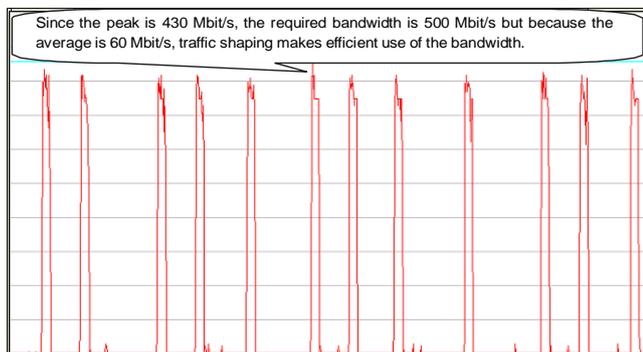
Fig. 3 Monitored Teleconferencing Server Stream

Improving the QoS of streaming service requires increasing the network bandwidth to a level that can handle the maximum traffic by direct monitoring on each streaming network.

In addition, data-shaping countermeasures are needed at the streaming-server side.

3. Application Example and Network Pre-verification

> ## Verifying and Solving Packet Loss and Data Delay

When constructing a streaming network, problems can be avoided by pre-verifying the data buffering memory performance of each router, and the network bandwidth priority performance at data overflow. The MD1230B verifies buffer performance by imposing a load on the network to intentionally cause packet loss and data delays. In addition, it verifies bandwidth priority performance by changing the load data priority.

4. Features

- Real-time measurements with 1-ms resolution (1000 measurements every second)
- In-service and out-of-service analyses
- Simultaneous, real-time delay and packet loss QoS evaluations for each application

5. Summary

Using Anritsu's Application Traffic Monitor software option with MD1230/MP1590 family of testers helps spot potential problems when pre-commissioning streaming networks.

Configuration	Main Frame: MD1230B, MP1590B Plug-in Module: MU120131A[1]/32A[1] Software version: Version 7.0 or later[2]
Option	MD1230B/MP1590B-20 Application Traffic Monitor

1: MU120131A/32A only used with ports 1 thru 4

6. Ordering Information

> **MD1230B**
MD1230B   Data Quality Analyzer
MD1230B-20   Application Traffic Monitor
MU120131A   10/100/1000M Ethernet Module
MU120132A   Gigabit Ethernet Module
> **MP1590B**
MP1590B   Network Performance Tester
MP1590B-20   Application Traffic Monitor
MU120131A   10/100/1000M Ethernet Module
MU120132A   Gigabit Ethernet Module