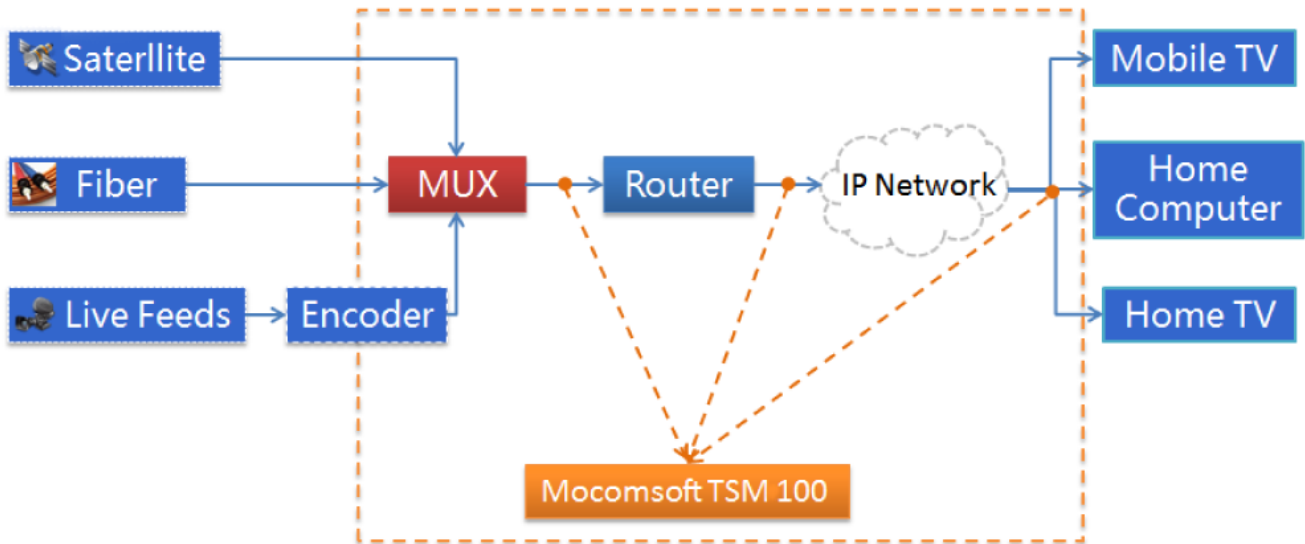# Mocomsoft

Remote Monitoring of Digital Video over IP

Using IP transport to deliver digital video data is a common practice right now. The IP transport is being used in the backhaul operation between network head-ends, between different video processing equipment, as well as consumer end-user distribution. However, by design, IP transport is not a constant bitrate transport, and can introduce jitter as well as packet loss. Video delivered over the Internet which the video provider does not have full control can exacerbate the problem. On the other hand, video transport has strict requirements in terms of timely delivery of the video and audio packets to the receiver TV or set-top boxes. There are numerous possibilities that may cause errors on video transport stream and result in decoding problem or Quality of Service issues. Therefore, it is important to have service providers to actively monitor their service data and discover and resolve any potential problems.

The Mocomsoft TSM100 is a remote, 24 x 7 monitoring platform designed to verify the quality of digital audio and video services delivered over IP network. The system is suitable for monitoring MPEG-2/H.264 programs delivered over the Internet, as well as head-end equipment that uses IP for video transport.

The TSM100 provides both IP layer analysis and MPEG-2 transport layer analysis, as well as audio and video decoding, and service profiling. The system receives IP encapsulated digital audio and video data via 10/100/1000 Mbps and 10Gbps Ethernet port. It will monitor all media flows in the network, and perform extensive test on standard compliance and user profile matching.

Key Features :

- Supports UDP and RTP/UDP protocols
- Monitors all services on GigE input
- Calculates MDI (Media Delivery Index) on all services
- Supports MPEG-2 and H.264 video compression standards
- Supports both MPTS & SPTS
- Decodes MPEG-2 and H.264 video thumbnails
- Real-time comprehensive MPEG TS layer analysis
  - Standard compliance based on TR 101 290 and ATSC A-78
  - Bandwidth utilization and PID monitoring
  - PCR clock analysis
  - Elementary stream buffer analysis
  - Real-time video and audio program decoding
  - Real-time PSI/SI table decoding
  - EPG construction
- Multicast support with IGMP Join/Leave capability
- User defined profile matching
- Configurable thresholds and alarm setting
- Audio/Video loss, frozen frame, and black frame detection
- MPEG transport stream recording and playback
- User-friendly and intuitive user interface
- Full-featured remote client application, including remote video rendering
- Database for error logging and after-facts analysis
- Email and/or SMS alarm
- Andriod App for accessing the monitoring system from a mobile device
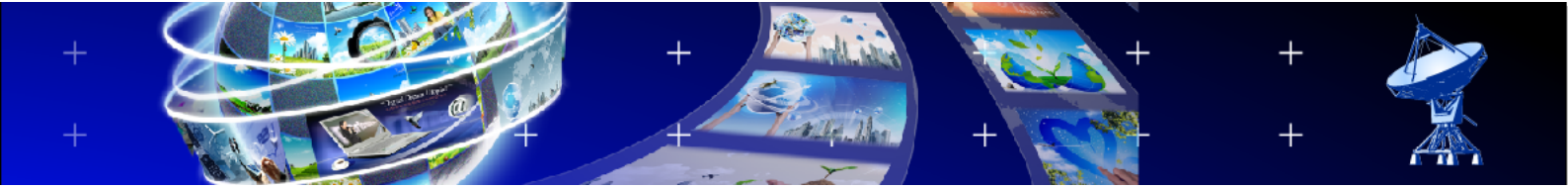
IP Layer Analysis

Media Delivery Index (MDI)

The Mocomsoft TSM100 computes the Media Delivery Index on all IP flows. The MDI includes two measurements: Delay Factor (DF) measures the IP packet jitter; Media Loss Rate (MLR) measures the packet loss over time. Both parameters are calculated by the TSM100.

Bandwidth Monitoring

The TSM100 will monitor the bitrate of all flows in the network. The operator can create a profile to specify the minimum and maximum bitrates allowed for specific media flows and test if the actual bitrate is within the bands, and send an alarm if the bounds are violated.

Comprehensive TS Layer Monitoring

Real-time monitoring of digital audio and video data on all services in the network.
- Supports MPEG-2 and H.264 video compression standards
- Supports MP3, AAC, AAC+, AC3 audio encoding standards
- Standard compliance based on TR 101 290 and ATSC A-78
- Bandwidth utilization and PID monitoring
- PCR clock analysis
- Elementary stream buffer analysis
- Real-time PSI/SI table decoding and analysis
- EPG construction
- Stream capture
- File playback and analysis

Intuitive GUI interface allows you to see if a service is alive and has correct contents and the errors that have occurred. Test results are well organized and easy to interpret, allow non MPEG experts to use the system.

Remote User Interface

Remote View App can be used to remotely view test results and control the monitoring system . Unlike a typical browser based client view, the Remote View comes with TSM 100 which is a fully featured Windows application, and can dynamically display video thumbnails and all test results. In addition, it enables the streaming of audio and video data from the TSM 100 to the client PC over IP network connection, allowing visual verification of Quality of Service (QoS).

Error Logging and Alarms

All errors detected are logged in a database pre-installed in the system. The logging feature allows the operator to search specific errors based on various searching criteria, including error code, time period the error has occurred. Selected errors can be exported to a text file. The TSM 100 allows user to create IP flow and transport stream profile,and the system will test the actual input data against user entered profile, record and alarm any deviations from user

defined profile.The alarm message can be sent by email and/or SMS. The system also comes with an Android app to be used for remotely accessing the monitoring for a quick check of error status.

Specifications

Input Interface:

Ethernet (RJ45 or Optical), 10/100/1000 Mbps and 10Gbps

System:

1 RU Rack mount
100-240V ~5A, 50-60Hz
Dimension:42.4x434x610(mm)
Weight:15kg
4GB DDR2 SDRAM
500 GB hard disk drive
DVD-RW
Windows 7

Enviroment:

Operating temperature: +0C to +35C
Compliance CE & FCC Class B

Data Communication:

External USB ports, USB 2.0 compliant
1x Ethernet port

Contacts:

Mocomsoft, Inc
27 Lehigh Court
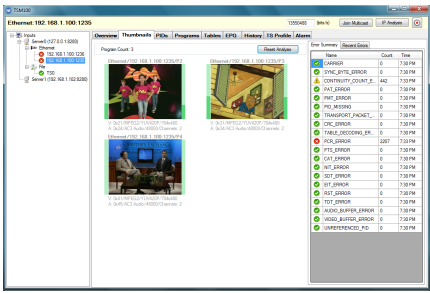Princeton, NJ08540
Tel: (001) 614-270-9617

Figure 1 shows video thumbnails and error summary during the entire monitoring period. This helps the operator to see if expected services are running and if there are errors in the transport stream.
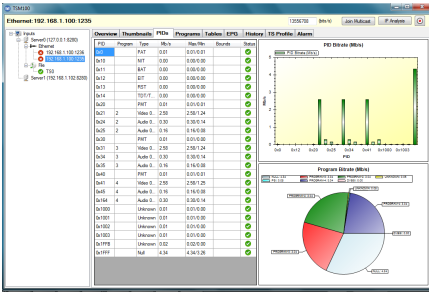

Figure 2 shows all PIDs in the transport stream. Each PID represents a meta-data or an audio/video elementary stream. The bitrate of all PIDs are continuously monitored and display graphically.
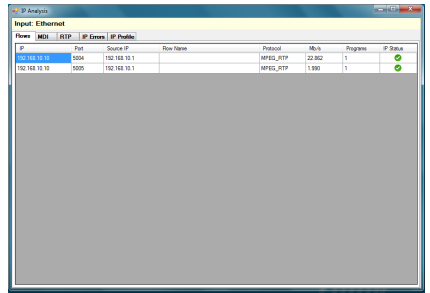

Figure 3 shows the IP Layer test and analysis results. The system displays all audio/video services in an IP network, and calculates the bitrate and media delivery index (MDI) for all services.