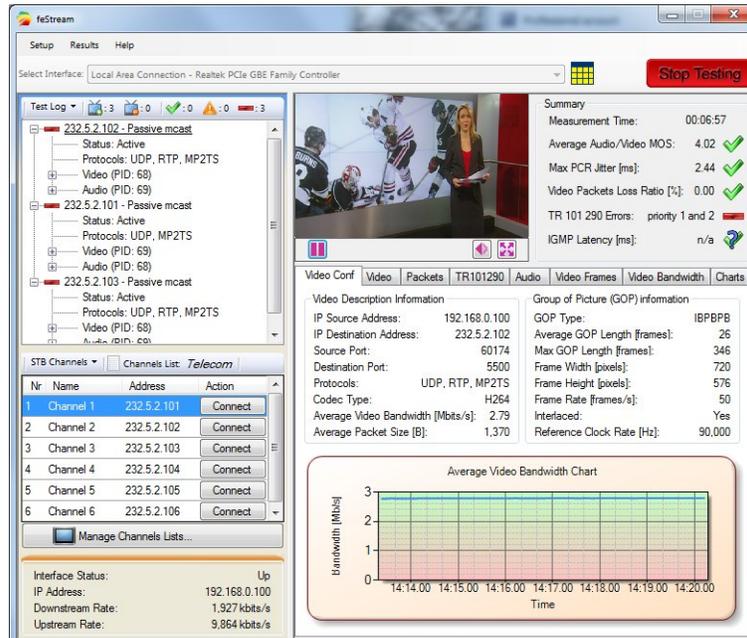# feStream™
IPTV Expert Analyzer

Give your field service a simple way to deploy reliable IPTV services.

Main Features

- Go/no-go results within seconds
- Automatically tests all channels with pass/fail results
- Complete Set Top Box (STB) emulation
- Full Motion Picture video preview
- Accurate audio and video MOS scores and QoE/QoS metrics
- Comprehensive Video and Transport Stream statistics
- Drill into detail to determine root cause of problems
- Summary and detail PDF report generation

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A rapidly growing number of telecom operators are making a profit by offering IPTV services. The allure of profit is driving more startups and operators to join the IPTV industry and it's quickly getting very competitive. More than ever, each operator needs to provide the highest level of service to protect their customer base.

Customers don't care that their video can be impacted by the IP core network, DSL/Fiber modem or STB. However, they do care if their video is frozen, pixilated, or the audio is out of sync. feStream Analyzer allows field service technicians to quickly test and qualify IPTV installations. If the service fails, feStream Analyzer give the technician the tools he needs to probe deeper to determine the root cause. feStream Analyzer transforms your PC into a power IPTV Analyzer that can fully emulate a TV Set Top Box (STB). To emulate a STB, connect the Ethernet port of your notebook computer to the Ethernet port of your xDSL or fiber modem.
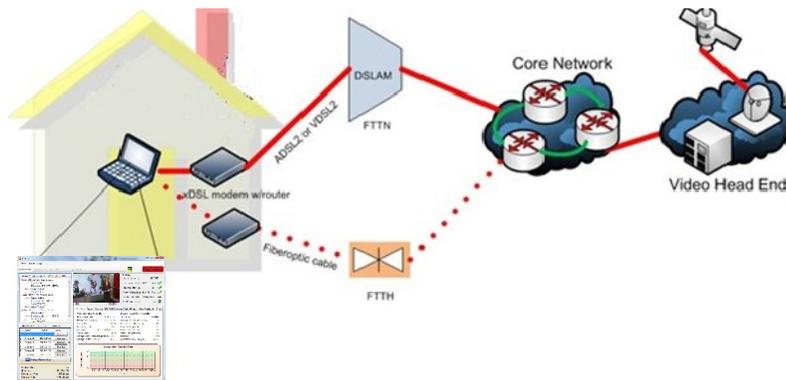
Just click on the "Start Testing" button and feStream Analyzer will automatically synchronize with any multicast IPTV streams detected in the link between the STB and the modem or GPON terminal. VoD unicast streams will be detected during the "sign up" process initiated by the STB Remote Control.

Once a channel is selected for testing, a video preview of that channel begins to run, providing quick assurance that IPTV services are available. However, just watching the video is not sufficient to qualify IPTV services. The IPTV signal could be degrading due to a number of reasons, and the user won't see the effect on their television until the service technician is long gone. The service technician needs to know that the IPTV signal is not being impaired by hidden effects from the IP network, modem, router, STB, CO and more.

feStream Analyzer provides a summary display with several key QoS measurements rated with pass/fail indicators, revealing the true quality of the video stream under test.

The mean opinion score (MOS) is a measurement that results from a complex algorithm that monitors more than 40 parameters in real-time. If the score passes, you can bet the subscriber will get excellent video quality. The Summary of pass/fail indicators is further complemented with a measurement of program clock reference (PCR) jitter, video packet loss, TR101290 (priority 1&2) transport stream errors, and IGMP latency, commonly called "zap time".

Two graphs offer a set of comprehensive user-defined statistics, which guarantee a service technician has all of the necessary IPTV vital signs at their disposal to time-correlate with other results. Additional QoS diagnostics are organized into categories including IP Packet metrics, Transport Stream metrics , Audio-Video metrics and Video Metrics. This comprehensive analysis suite ensures that a technician can quickly verify IPTV service quality or easily resolve issues such as pixilation, frozen screens, slow channel changes, service disruption and more. Further, these metrics enable the technician to know exactly what the user quality of experience will be, even before a STB or TV is connected.

feStream Analyzer can generate test reports for either individual video streams tested, or for all of the video streams tested. All results can be saved to disk as a PDF file so that the service technician can leave with a complete report of all results. The graphical user interface is neatly laid out and allows the operator to select to display only the key parameters which they are interested in seeing.

Specifications

Physical Layers Supported -

- 10/100/1000 Ethernet, Wi-Fi 802.11 b/g/n

Recognized Video Compression Standards

- MPEG2, MPEG4 part 2&10 (H.264)

Signaling Protocols -

- IGMP v2/v3

STB Emulation -

- PID channel list & multicast address
- Channel name
- Channel auto scan
- Active stream source and destination addresses
- Video codec
- Stream content (PID with bitstream)
- IGMP latency (ZAP time)
- Video preview (live full frame)
- Simultaneous multiple streams operation

Video Description Information -

- IP source address
- IP destination address
- Source port
- Destination port
- Protocols
- Codec type
- Group of picture type
- Current GOP length
- Average GOP length
- Max GOP length
- Average gap of I frame
- Frame width
- Frame height
- Frame rate
- Is interlaced
- Average number of slices in I frame
- Reference clock rate

Transport Packets Metrics -

- Packets received
  - Lost
  - Discarded
  - Corrected
  - Out of sequence
  - Duplicated
- Lost %
- Corrected %
- Discarded %
- Out of sequence %
- Duplicated %
- Burst count
- Burst loss rate
- Average burst length [pkts}
- Gap count
- Gaps loss rate
- Average gap length [pkts]

Video Perceptual Quality Metrics -

- Instantaneous absolute MOS
- Minimal absolute MOS
- Average absolute MOS
- Maximum absolute MOS
- Instantaneous relative MOS
- Minimal relative MOS
- Average relative MOS
- Maximum relative MOS
- Instantaneous audio/video MOS
- Minimal audio/video MOS
- Average audio/video MOS
- Maximum audio/video MOS
- Transmission quality:
  - EPSNR
  - EPSNR(ATIS)
- Degradation Factors:
  - Lost
  - Discarded
  - Codec quantization level
  - Codec bandwidth restrictions
  - Frame resolution
  - Frame rate
  - GOP length
  - Available network bandwidth
  - Audio/video synchronization
  - Recency

Audio Description Information-

- IP source address
- IP destination address
- Source port
- Destination port
- Type
- Transport protocol
- Codec Type
- Number of channels
- Reference clock

Audio Perceptual Quality Metrics -

- Minimal MOS
- Average MOS
- Maximum MOS
- Instantaneous MOS
- Degradation factors
  - Lost
  - Discarded
  - Codec
  - Recency

MPEG2-TS TR101290 Priority 2 -

- Last errors
  - Transport error count
  - CRC error count
  - PCR error count
  - PCR repetition error count
  - PCR discontinuity error count
  - PCR accuracy error count
  - PTS error count
  - CAT error count

MPEG2-TS TR101290 Priority 1 -

- Last errors
  - TS sync loss count
  - Sync byte error count
  - PAT error count
  - PAT2 error count
  - Continuity error count
  - PMT error count
  - PMT2 error count
  - PID error count

RTP Packets Metrics (Carrying MPEG2-TS)

- Packets received
  - Corrected
  - Lost
  - Discarded
  - Out of sequence
  - Duplicated
  - With timestamp errors

Video Jitter -

- Frame inter-arrival jitter
- I frame inter-arrival jitter
- Average frame arrival delay
- Peak frame arrival delay

Video Scene Analysis Metrics -

- Instantaneous detail level
- Instantaneous motion level
- Instantaneous panning level
- Static image proportion
- High detail proportion
- Low detail proportion
- High panning proportion
- Low panning proportion
- High motion proportion
- Low motion proportion

Jitter Metrics (RFC3550) -

- Packet to packet delay variation
- Max packet to packet delay variation

LAN Port -

- Interface
  - Status
  - Type
  - Speed
  - Support multicast
- Details
  - Physical address
  - IP address
  - Subnet mask
  - Default Gateway
  - DNS server
- IPv4 statistics
  - Received and Sent
    - Bytes
    - Packets
    - Unicast packets
    - Packets with errors
    - Packets discarded
    - Non unicast packets

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