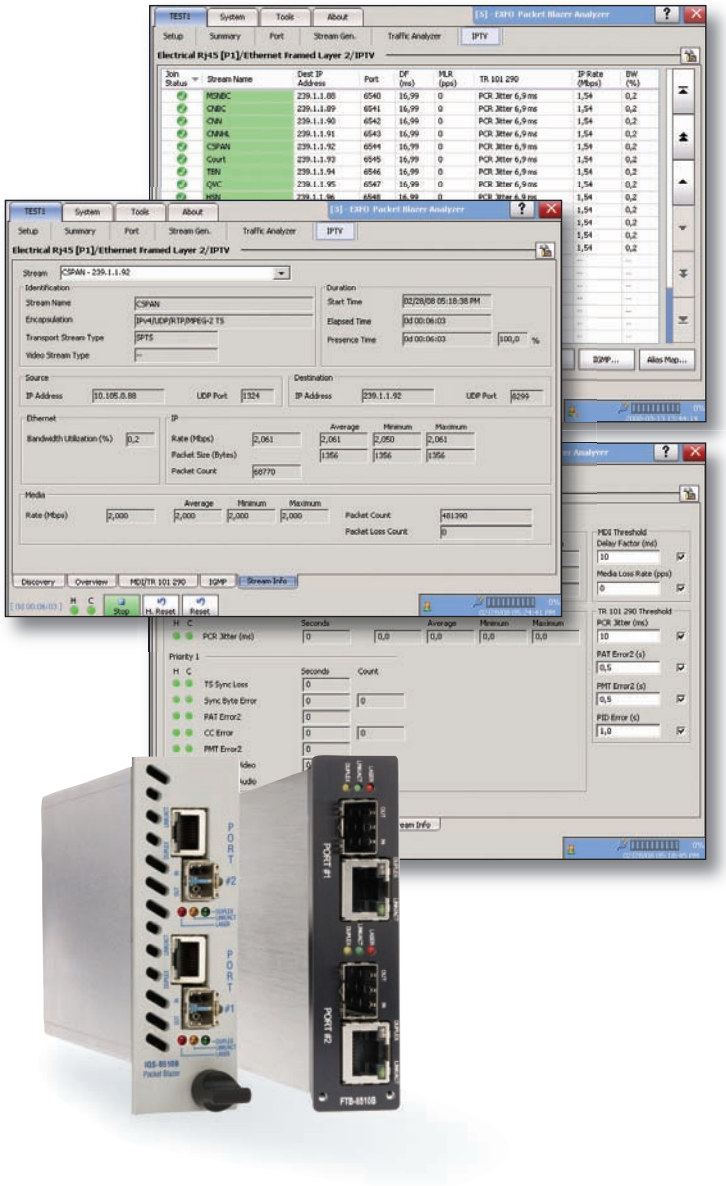
FTB/IQS-8510B

Packet Blazer Ethernet Test Module

NETWORK TESTING–TRANSPORT AND DATACOM



Powerful IPTV testing for service rollout, troubleshooting and monitoring applications

- Full range of test metrics on up to 100 simultaneous streams
- Supports industry-standard media delivery index (MDI), as per RFC 4445
- Supports industry standard TR 101 290 priority 1 DVB metrics
- Full Ethernet test capability and IPTV test metrics on a single platform
- Software option on the FTB-8510B and IQS-8510B Ethernet test modules

Platform Compatibility

- FTB-500 Platform
- FTB-400 Universal Test System
- IQS-600 Integrated Qualification System
- IQS-500 Intelligent Test System

Next-Generation Network Assessment

EXFO
EXPERTISE REACHING OUT

überreicht durch: Opternus

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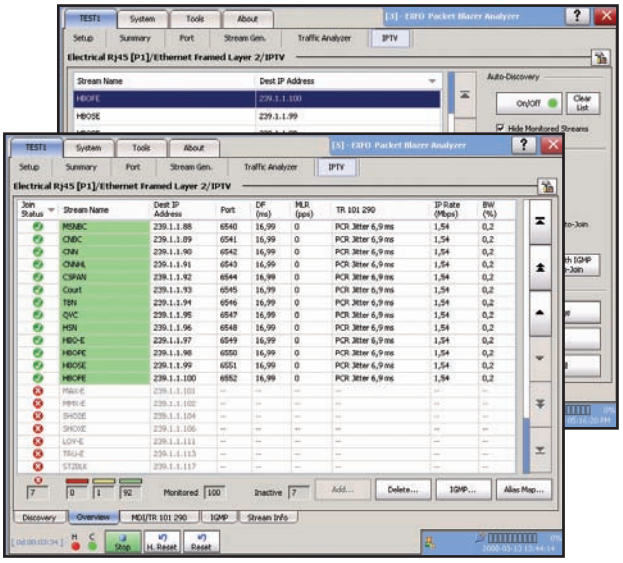
Opternus GmbH
April 2009

Meeting the Challenge of IPTV Testing

Internet protocol television (IPTV) has brought telecom service providers to take a step from providing best-effort IP (Internet) services to guaranteeing the quality of service that is essential for IPTV services. IPTV is broadcasted over a complex IP architecture; therefore, any network impairment can affect the video and/or audio component of a digital TV program. As a result, service providers are taking a new look at how they roll out new higher-layer services in order to match both IP transport requirements and customers' quality expectations.

As an established expert in Ethernet and IP technology, EXFO is meeting the IPTV challenge by introducing a new IPTV test and monitoring software option for the FTB-8510B and IQS-8510B Packet Blazer™ Ethernet Test Modules. Along with the existing feature set that delivers performance assurance for Ethernet-based frame services, the IPTV suite of test applications offers all the measurements required for testing video quality and validating service-level agreements (SLAs) between service providers and their customers.



IPTV Overview page.

EXFO's new IPTV software options are built on the current Packet Blazer Frame Analyzer engine, making it possible to troubleshoot an Ethernet circuit and analyze customer traffic for errors. The IPTV software option includes a full suite of measurement capabilities, such as RFC 4445 (MDI), TR 101 290 priority 1 metrics, program clock reference jitter, stream rate, IP metrics and bandwidth utilization for up to 100 simultaneous MPEG-2, MPEG-4, or VC-1 unicast or multicast video streams. Additionally, configurable alarm thresholds are provided on selected metrics for customized testing applications. Important usability features include auto-discovery of all valid media streams and user-definable stream labels for easy identification. Selecting which streams to monitor is accomplished by automatically adding the streams from the auto-discovery pool or with specific IGMP join commands. Up to 100 IGMP commands (join/leave) can be issued at once.

These combined features provide customers with the industry's most powerful portable test instrument and analysis tool for full transport-layer and service-layer testing. All metrics are clearly displayed through our simple-to-use Smart User Interface, which lets you tailor screen configurations, customize test routines and format reports on a real-time and historical performance basis.

The real value of any test instrument is a combination of powerful test capabilities and user-friendliness. With EXFO'S IPTV software, users only need to focus their attention to the IPTV Overview page, which provides all critical information on one page, in an easy-to-read format. In a single glance, users have access to information on IGMP join status, stream name, destination IP address and port number, delay factor, media loss rate, TR 101 290 priority 1 metrics, IP rate and bandwidth utilization. Streams are color-coded for easy identification: red for alarmed, yellow for a cleared alarm and green for no alarm. But the true value of the Overview page lies in its dynamic qualities. All information presented in the Overview page is updated in real time as new thresholds are crossed. Alarmed streams are automatically sorted to the top of the page for easy viewing and highlighted in red along with the corresponding metric that caused the alarm. Additionally, numerous counters reflect information such as failed IGMP joins, alarmed streams, monitored streams, etc. Finally, stream management is simplified through one-button access for adding or deleting streams, IGMP or Alias Map modifications. Thanks to the Overview page, users will never miss anything important during their IPTV test session.

Key Features

- 10 Mbit/s to 1 Gbit/s line rates
- Supports IPTV metrics for 100 media streams
- MPEG-2, MPEG-4 Part 2 and ITU H.264 (MPEG-4 Part 10) media stream support
- MPEG-2 transport stream as per ISO/IEC 13818-1
- MDI as per RFC 4445
- TR 101 290 priority 1 metrics
- Auto-discovery of media streams
- IGMP v2 support
- Configurable alarm thresholds
- User definable stream labels (alias table)
- Encapsulation IPv4/UDP and IPv4/UDP/RTP
- Program clock reference (PCR) jitter measurements
- IP packet metrics
- Media rate
- Bandwidth utilization

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Why Use MDI?

MDI (RFC 4445) provides users with the tools to measure and diagnose most network induced impairments for IPTV streaming media. It is comprised of two distinct measurements: the delay factor (DF) and media loss rate (MLR).

As a measure of media stream delivery quality, MDI is typically sampled at multiple points throughout the stream path, with the measurements serving as indicators of network problems that can be addressed before they affect the end customer's service.

DF is the time difference between the arrival and the drain of the media packets. It takes into account the amount of jitter present in the media stream and provides a measure of the required buffer needed for error-free transmission at the next downstream point.

Large DF values indicate severe jitter in the network which in turn indicates that the network requires more latency (large buffers) in order to compensate for the time needed to fill the buffers before the packets can begin to be sent to the receiver.

MLR is the count of lost and out-of-order flow packets over a one-second sampling period. It is important to include out-of-order packets in the MLR metric, as many stream consumer-type devices do not reorder packets that are received out of order. Therefore, any lost or out-of-order packet will introduce errors and visible distortions to the media stream which may be perceptible to the end viewer. This fact makes the MLR component of MDI an often-used measure for service-level agreements.

IPTV Testing with the FTB/IQS-8510B

Equipped with the IPTV option, the FTB/IQS-8510B Packet Blazer modules can be used at different points in the network to collect data and help isolate a fault affecting the IPTV service quality. See figure 1 below.

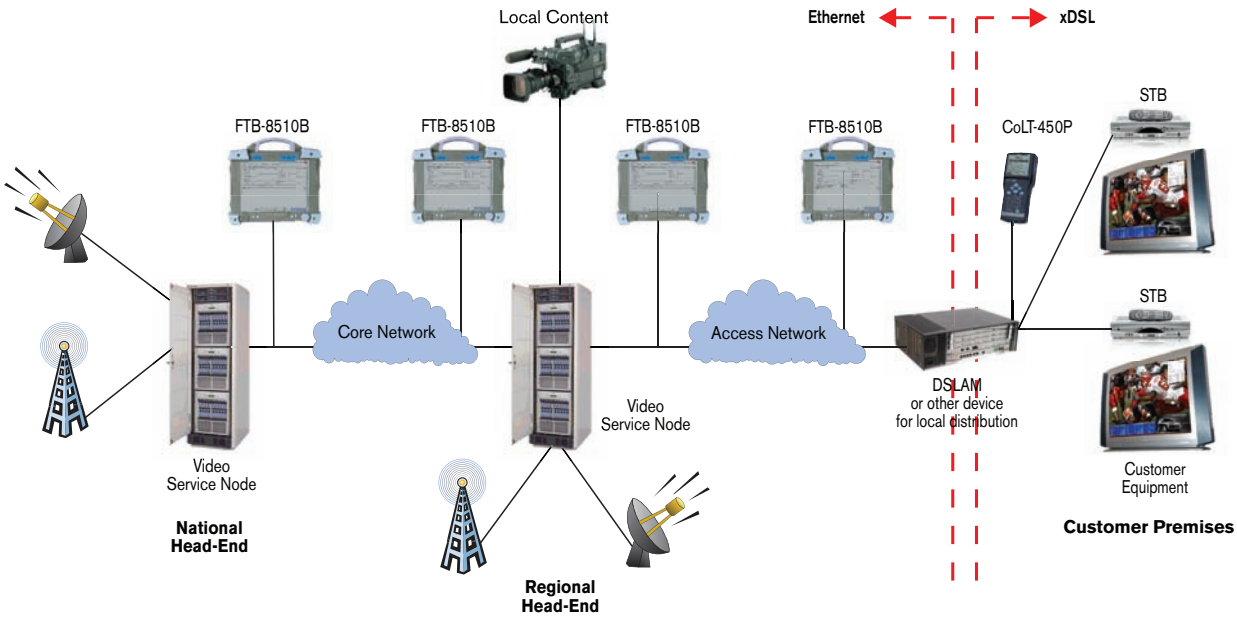

Figure 1. IPTV testing can be performed at multiple points in the network where an electrical or optical Ethernet interface is available, typically through a test port.

The IPTV network must be tested and characterized upon introduction of new services. In addition, it must be monitored constantly to limit unexpected service degradation. Figure 1 presents a typical test configuration where the FTB/IQS-8510B can be used to monitor a specific section of the IPTV network. Test connections using a single- or dual-port test topology. Test connections can be established to monitor the IPTV streams at appropriate test points available from the core or access network devices (video streamers, routers, switches, etc.) using either electrical or optical Ethernet interfaces.

As seen in figure 1, the FTB-8510B modules enable the parallel monitoring of up to 100 unicast or multicast IP addresses to support IPTV monitoring (including VoD basic monitoring). The monitoring includes the ability to report statistics on MDI and PCR jitter in addition to other key statistics such as IP packet metrics, media rate, presence measurements and bandwidth utilization, which are necessary to correctly characterize an IPTV stream.

What's more, while monitoring the selected IP address in the IPTV network, all the functions supported via the Frame Analyzer application are also simultaneously available. This provides additional insight to troubleshoot IPTV issues that could originate from the Ethernet layer.

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SPECIFICATIONS

Interfaces	10 Mbit/s, 100 Mbit/s, 1 Gbit/s (electrical) 100 Mbit/s, 1 Gbit/s (optical)
Parallel monitoring capacity	100 streams
Codecs	Video MPEG-2, MPEG-4 Part 2, MPEG-4 Part 10 (H.264) and VC-1 Audio MPEG-1, MPEG-2, Advanced Audio Codec (AAC), Dolby AC-3, MPEG-4 AAC and MPEG-4 HE AAC
Stream information	Stream name Encapsulation (IPv4/UDP or IPv4/UDP/RTP) Transport stream type (SPTS) Video stream type (MPEG-2, MPEG-4 Part 2, MPEG-4 Part 10 (H.264) or VC-1) Source and destination IP address Source and destination UDP port number Start time Elapsed time Presence time
IPTV statistics	RFC 4445 media delivery index - Delay factor (current, average, min, max) - Media loss rate (current, average, min, max) - Virtual buffer size (current, average, min, max) ETSI TR 101 290 (Priority 1) - TS sync loss - Sync byte error - PAT error2 - Continuity counter error - PMT error2 - PID error (video, audio) PCR jitter (current, average, min, max)
Stream statistics	Ethernet - Bandwidth utilization IP - IP rate - IP packet size - IP packet count Media - Media rate - Packet count - Packet loss
Through mode [a]	Capability to test in Through mode or Pass Through mode

NOTE

a. Available as a software option.

ADDITIONAL FEATURES

IGMP v2 with join/leave statistics
Stream auto-discovery
Stream auto-monitoring
Stream alias table
Configurable alarm thresholds
- MDI DF
- MDI MLR
- PCR jitter
- PID error
- PAT error 2
- PMT error 2

ORDERING INFORMATION

MODULE

FTB-85XX-XX

Model	Other options
FTB-8510B	00 = Without other options
FTB-8510B-1	100optical = 100 Mbit/s optical capability on both ports
FTB-8510B-2	TCP = TCP throughput measurement
	IPTV_MON = IPTV testing and analysis (10 streams)
	IPTV_MaxStream = IPTV testing and analysis (100 streams)
	ETH-THRU = Through mode testing [a]

Example: FTB-8510B-2-100optical

For Ethernet optical interfaces, FTB-859x transceivers have to be ordered separately.

MODULE

IQS-85XX-XX

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IQS-8510B	00 = Without other options
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Example: IQS-8510B-2-100optical

For Ethernet optical interfaces, IQS-859x transceivers have to be ordered separately.

TRANSCEIVER

FTB-8590 = 1000Base-SX (850 nm) LC connectors; optical SFP transceiver module for FTB-8510B Packet Blazer
FTB-8591 = 1000Base-LX (1310 nm) LC connectors; optical SFP transceiver module for FTB-8510B Packet Blazer
FTB-8592 = 1000Base-ZX (1550 nm) LC connectors; optical SFP transceiver module for FTB-8510B Packet Blazer
FTB-85910 = 100Base-FX (1310 nm) MM, LC connectors; optical SFP transceiver module for FTB-8510B Packet Blazer [b]
FTB-85911 = 100Base-LX (1310 nm) SM, LC connectors; optical SFP transceiver module for FTB-8510B Packet Blazer [b]

NOTES

a. Available with the FTB/IQS-8510B-2 only.

b. Available with the 100optical option.

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