



## Introducing the IP Video Test Suite for the JDSU MTS/T-BERD® 8000 Transport Module

The JDSU IP Video Test Suite for the MTS/T-BERD 8000 Transport Module puts the power of comprehensive IPTV test in the technician's hands, enabling the verification of video service deployment and quality of service (QoS) assurance in transport networks—leading to enhanced user quality of experience (QoE). By complementing the existing Ethernet and IP capabilities of the Transport Module, the IP Video Test Suite provides testing capabilities that include verification of video service connectivity and analysis of true QoS for MPEG-2 Transport streams. Additional features include the ability to verify packet loss, packet jitter, media delivery index (MDI), distance error and period errors, program clock reference (PCR) jitter, TR 101 290-based statistics (TS sync loss, continuity counter errors, etc.), and analyze programs and their packet IDs (PIDs) per stream.

### Features

- Video (MPEG-2 Transport Stream, or MPTS) analysis, from 10 Mbps to 10 Gbps, in a single module
- Single Program Transport Streams (SPTS) and Multiple Program Transport Streams (MPTS) in a single platform
- Analysis up to 512 SPTS and 32 MPTS
- Access to MPEG-2 transport streams via a monitor access point and/or IGMP-based network access
- Full Video QoS analyzer including physical layer, transport network, and video streams views
- Analysis of packet jitter, packet loss, MDI per RFC 4445, distance and period errors (per RFC 3357), PCR jitter, and TR 101-290-based MPEG-2 error conditions
- Detailed analysis of video channels/programs performance and PIDs within MPEG-2 streams
- Customizable thresholds to verify QoS for key network and video stream results, including packet loss, packet jitter, MDI, PCR jitter, and TR 101 290 errors
- Easy-to-use graphical user interface (GUI) that minimizes technician's learning curve

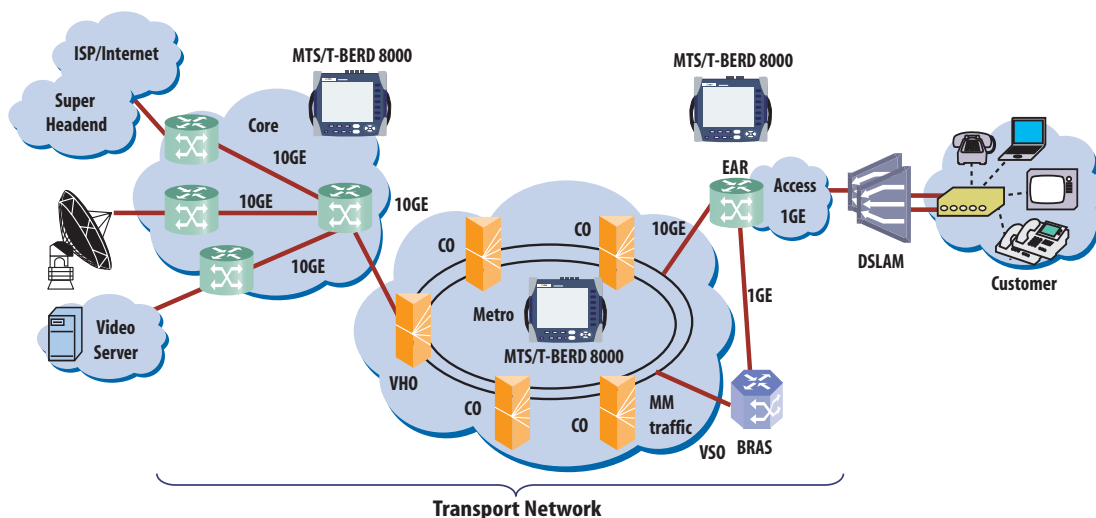


Figure 1 - Network Deployment - Video Services

# IP Video Test Suite

## for the JDSU MTS/T-BERD® 8000

### Transport Module

#### Applications

The JDSU IP Video Test Suite for the MTS/T-BERD 8000 Transport Module focuses on connectivity and analysis of the transport network in IP video deployment. Once video streams are encoded at the super headend, understanding the impact of the transport network on those streams is critical. For example, an important metric is the measurement of PCR jitter. The jitter source can be identified by evaluating more than one channel/program at a time. If excessive PCR jitter is present in more than one channel, then overall network jitter is most likely at fault. If excessive PCR jitter is present in only one channel, then a video source problem (at the super headend) is typically the cause.

#### Verify Video Stream Connectivity

- Correctly verify network provisioning by accessing video streams at various network points and analyzing receipt of the streams and their QoS at each point
- Verify that the physical, transport network and video stream layers are free of errors and alarms
- Ensure throughput by verifying video streams' bandwidth transported through multiple IP multicast paths

#### Ensure Video Stream QoS

- Analyze streams by measuring packet loss and jitter on 512 SPTS and 32 MPTS, respectively, in the video explorer application
- Perform detailed troubleshooting in the video analyzer application:
  - Validate transport network quality conditions: packet loss, jitter, MDI, distance error and period errors, and
  - Validate video stream quality conditions: PCR jitter, TR 101 290 errors such as TS sync loss errors, continuity counter errors (i.e. video packet loss), transport error indicator, PID, PAT and PMT errors
- Verify specific channels/programs and perform PID analysis with the ability to display PIDs (audio/video/data), their IDs, and rates (Mbps) per stream in the module's analyzer application

The stability, scalability, and functionality of transport networks have a tremendous impact on the quality of video service received by customers. It is important to understand that IP video service flows are packet flows, which are subject to loss and jitter as well as physical layer impairments. The ability to correlate errors seen at the application level with the transport layer is crucial. Combining transport module test capabilities and an IP Video Test Suite in a single tool enables providers to quickly and efficiently sectionalize and resolve video problems in transport networks.

The screenshot shows the 'Streams' summary table in the software. The table has columns for Name, IP Address, Port, MPEG, #Prgs, Mbps, Pkt Loss, Pkt Jitter (ms), VLAN, SVLAN, and Tunnel. All 'MPEG' cells are highlighted in green and contain the word 'PASS'. The status bar at the bottom indicates 'Streams: 6' and 'Rx Mbps, Cur L1: 10.79'.

Name	IP Address	Port	MPEG	#Prgs	Mbps	Pkt Loss	Pkt Jitter (ms)	VLAN	SVLAN	Tunnel
2240.1.1	1234	1234	PASS	1	1.58	3	4.967	N/A	N/A	N/A
2240.1.1	1234	1234	PASS	1	1.92	6	4.967	N/A	N/A	N/A
2240.1.1	1234	1234	PASS	1	1.95	6	5.022	N/A	N/A	N/A
2240.1.1	1234	1234	PASS	1	1.80	3	4.767	N/A	N/A	N/A
2240.1.1	1234	1234	PASS	1	1.60	4	5.156	N/A	N/A	N/A
2240.1.1	1234	1234	PASS	1	1.89	2	5.189	N/A	N/A	N/A

## The Power of One— Performing the Work of Many

Combining multiple test capabilities with unprecedented levels of field modularity and integration, the JDSU T-BERD 8000 allows integration of one or all of the following modules for provisioning and maintaining short-haul, long-haul, FTTx, Metro, CWDM, and DWDM networks:

#### Transport module

The only solution available that combines T1/E1-10G SONET/SDH, 10/100/Gig Ethernet, 10Gig Ethernet LAN/WAN PHY, IP, Fibre Channel, and OTN technologies in one convenient package.

#### Optical Time Domain Reflectometer (OTDR)

With over 17 different plug-in modules covering all configurations from short-haul to ultra-long haul networks

#### Chromatic Dispersion (CD)

Based on a single ended method requiring only one technician to perform the test

#### Polarization Mode Dispersion (PMD)

For qualifying the fiber plant before installing high-speed transmission technologies and avoiding costly service disruptions and/or rework

#### Wavelength Division Multiplexing (WDM)

For channel testing and measuring spectral attenuation in the C and L bands

#### Optical Spectrum Analyzer (OSA)

For high-performance, full-spectrum analysis with unique options for 10.7G channel isolation and ROADM network testing

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