GPON Doctor 4k7 protocol analyzer

GPON professional protocol analyzer

GPD 4k7

Standalone, portable and rugged FTTH GPON protocol analyser. GPON Doctor 4k7 is a professional tool for troubleshooting, monitoring and debugging a GPON-based Fibre to the Home network. It is the perfect companion for on-site FTTH troubleshooting related to GPON protocol or IP service delivery.

Complete Appliance

The GPON Doctor 4k7 is a chipset-less portable passive GPON FTTH protocol analyser. It connects to a distribution fibre point of a GPON network and captures bit-level data in the upstream and downstream and interprets all control information at PLOAM and OMCI levels.

GPON Doctor 4k7 is the ultimate solution for troubleshooting, certification, and interoperability analysis in GPON deployment. It is specifically designed to cater to the needs of GPON deployment operators, installers, and hardware manufacturers. The solution comprises of GPON data acquisition hardware, a high-performance chassis/device, and software for analyzing the acquired data.

The capture hardware is self-implemented with state-of-the-art optical modules and large processing capacity, ensuring the highest level of performance and reliability. The device synchronizes seamlessly with the upload and download link at any point of the GPON fiber and automatically calibrates itself, enabling long-term captures. Furthermore, it expertly extracts and decrypts Ethernet traffic from the upper layer in real-time, allowing for the seamless regeneration of services.

Troubleshooting, Certification & Interoperability tool

The software accurately interprets the data and provides the operator with a comprehensive review of the trace from the first to the last frame. Additionally, it expertly analyses the control messages and precisely estimates the GPON network topology, including the status of ONTs and OLTs, established data channels, exchanged configurations, OMCI E/R diagrams, analysis, and bandwidth graphs for each ONT per port and T-CONT.

This tool is built for Windows and enables seamless integration of analysis and management tools for other service protocols used over GPON, customized to meet the unique needs of our customers. Its user-friendly and intuitive interface ensures a low learning curve.

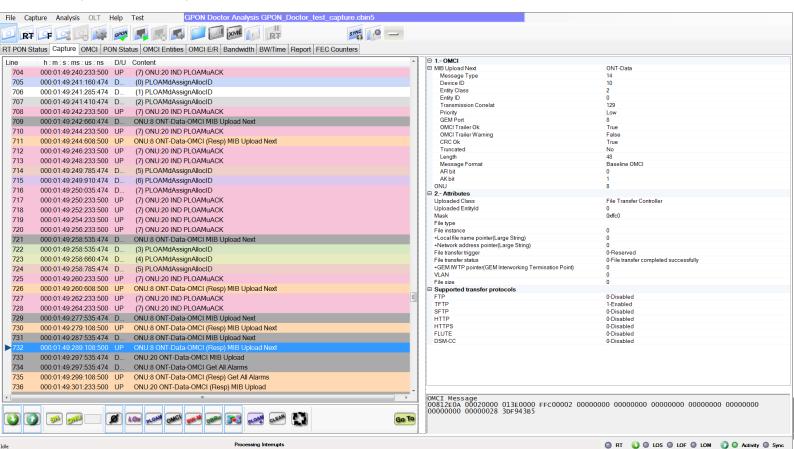*ALBEDO*

evaluating services configured over a PON.

Real-time GPON Capture

GPON Doctor 4k7 captures OMCI and GTC messages over the fibre in real-time, allowing for easy monitoring of negotiation processes and configurations. The tool provides real-time status updates on ONTs, GEM ports, and T-CONTs, ensuring efficient network management.

Analysis with Diagrams

The text presents detailed OMCI entity/relationship diagrams and bandwidth analysis.

It features a comprehensive OMCI entity/relationship diagram that showcases alarms and errors, ONT port and T-CONT bandwidth allocation diagrams, and time evolution diagrams. Additionally, it highlights a chipset-less hardware manufactured exclusively for this device enabling results independent of the proprietary implementation of any GPON equipment vendor.

Certification

GPON Doctor uses captured data to deduce the network topology and applies a set of rules to certify whether the ITU-T G.984.x recommendation is met. Its automatic adaptive timing, automatic calibration, and intuitive interface make it easy to use from day one. It accurately detects problems in a GPON network, evaluates and details the equipment causing the problem, and identifies the cause of the failure.

Autonomous and Portable

Equipped with interface to be controlled with your laptop this device weighs less than 2 kg.

Real-time extraction

The 10/100/1000BaseT interface enables the extraction and decryption of real-time Ethernet layer user traffic, which can be monitored and analyzed using external tools like external tools like WireShark. The hardware is equipped with an AES decryption engine.

Regeneration and QoS

The GPON Doctor 4k7 is capable of regenerating services in a PON network, including real-time extraction and reassembly of multicast video for QoS and QoE evaluation. This feature is essential for accurately

Applications

Optimizing GPON

Deploying multi-vendor ONUs is a viable solution to reduce CAPEX. Any OLT can interact with any ONT, regardless of the manufacturer, thus facilitating interoperability between vendors. Addressing the inherent characteristics of GPON networks is necessary to achieve:

- Commercial implementations of different versions of the standard.
- Activation issues may arise, and ONUs from a manufacturer other than the OLT will not be accepted.
- Misinterpretation of the standard.
- OMCI is a broad standard. Especially regarding Vendor Specific Entities.
- Operators exhibit heterogeneity in their provisioning of 'IP services'.

A PON network's structure involves splitting a fibre using optical power dividers or splitters. The degree of splitting determines the percentage of optical power that reaches an ONT.
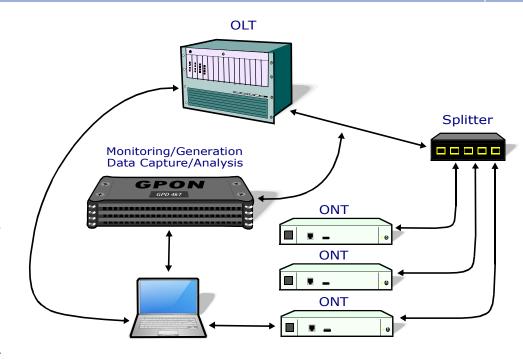
Controlling attenuation is crucial to prevent any of the network's active elements from operating under stressed conditions.

Neutral analysis and Capture

GPD captures and analyzes traffic within an FTTH network in accordance with ITU-T standards. Its automatic calibration, built-in touch screen, and high-performance chassis allow for the complete capture and analysis of GPON network traffic with just one click.

OLT

Splitter

Monitoring/Generation Data Capture/Analysis

GPON GPD 4k7

ONT

ONT

ONT

Capture modes

GPD 4k7 has several captures modes, from a "Full capture" to get all control and management traffic for in-depth troubleshooting to "Real-Time" that allows captures over long time periods to identify deviations from expected behavior.

The information captured can also be shared with other experts that can analyze it in their own computers using the GPD software.

Analysis and Assessment

The analysis software interprets captured information and presents it in a graphical and categorized format for in-depth analysis of GPON protocol compliance, interoperability evaluation, bandwidth allocation, and field troubleshooting.

The information collected by the GPON Doctor is analyzed to provide insight into:

- GPON network topology: ONTs detected, ONT and OLT operational status, data channels established,

- Established entities and the relationship between them,
- Bandwidth allocation graphs per port and T-CONT.

Real-time IP traffic extraction

GPD 4k7 allows for real-time extraction of clear-text user traffic in both upstream and downstream directions at the GbE layer.

Validation

To further analyze this traffic, you can use external or software-based upper-layer protocol analyzers. By combining GPON-Doctor with a traffic generator and an external or internal analyzer that incorporates GPONDoctor 4k7, you can create a powerful setup to validate the correct transmission of 'IP services' over the network.

Additionally, this feature can be used to regenerate IP services within GPONDoctor. The IPTV channels and VoD streams reproduce the voice stream in real-time to analyze their QoS and QoE and confidently identify any degradation in services.

❑

KEY FEATURES

- Reliable results
- Vendor Independent
- Capture and Analysis
- QoS Evaluation
- Full GPON Capture
- Real-time IP Services traffic extraction
- Remote control
- Automatic calibration
- Service regeneration
- Autonomous and Portable

APPLICATIONS

- Identification of problems
- GPON 984.x interoperability
- Diagnosis of incidents
- Analysis of protocols
- Certifications
- GPON Laboratories

USERS

- GPON installers
- Telecom operators
- Acceptance labs
- OLT, ONT manufacturers

GPON Doctor 4k7 Features	
Capture	• Inference of PON topology: ONU IDs, GEM ports • Real-time detection of activity on GEM ports • Capture and interpretation of PLOAM messages • Capture and interpretation of OMCI messages • Capture and interpretation of Bandwidth Maps for ONT discovery • Capture and interpretation of Bandwidth Maps for bandwidth allocation on operation • Real time capture mode • Background capture mode • Scheduled capture mode • Messages color scheme to facilitate visualization and analysis of the capture • Capture exportable to CBIN5 format • Capture exportable to XML format • Powerful filtering system for visualization and capture analysis
Analysis engine	PON characterization • Topology • PON parameters • ONU status (ID, timing parameters, keys negotiated, operation status, Alloc-IDs and GEM ports) Features • List of discovered OMCI entities. Interpretation of their attributes and values • Generation of accurate E/R diagrams • TU-T G.988 reference integrated: quick access to the entity's definition • Evaluation of conformity with ITU-T G.984 and generation of a list of specification violations • Evaluation of conformity with ITU-T G.988 and generation of a list of specification violations • Characterization of type and level of violations discovered • Direct access to the messages of the entities presenting nonconformities • Exportable analysis in HTML format
User traffic extraction	• Extraction of user traffic of up to 6 simultaneous GPON through virtual Ethernet interface over USB 3.0
Bandwidth monitor	• Bandwidth used per port • Bandwidth assigned per Alloc-ID • Bandwidth utilized per ONU • Real-time graphical visualization • Exportable to CSV
Link integrity monitor	• Upstream FEC errors monitor • Downstream FEC errors monitor • Real-time graphical visualization • Exportable to CSV
Automation	• Integrated CLI for remote operation and/or integration into automated certification or verification workflows • Protocol: Telnet • Configurable port
Interfaces	• USB 3.0 • SFP GPON ONT SC/PC TX 1310 nm / RX 1490 nm B+ (2.5Gbps) • SFP GPON OLT SC/UPC TX 1490 nm / RX1310 nm (1.25Gbps)
Platform Requirements	• USB 3.0 Interface • Windows Operating System • Accessories included: extraction splitter, optical modules, set of attenuators (4, 8 and 15 dB), SC/UPC-SCAPC patch cords
Ergonomics	Dimensions: • 210mm x 160mm x 30mm without SFP's • 230mm x 160mm x 30mm with SFP's Weight • Appliance weight: <1 kg 4700