GPONDOCTOR 2000

GPONDOCTOR
FTTH analysis & monitoring tools

PORTABLE FTTH GPON Networks Analyzer

DESCRIPTION

GPON Doctor™ 2000 is a passive analyser, chipset-less GPON FTTH protocol sniffer. Connected to any location within your PON distribution network (ODN), will capture downstream and upstream bit-level information. Provides comprehensive analysis of the GTC layer: PLOAM and OMCI.

GPON Doctor is mainly oriented for **problem detection, certification and interoperability tests,** being a perfect tool for lab application engineers engaged in GPON deployment phase or GPON active elements developers/ integrators.

GPON Doctor is a complete and autonomous solution: Composed by a GPON capture + evaluator card, a "state of the art" chassis and a processing software capable of analysing and evaluating the captured data.

Based on our own implementation, the capture hardware includes last generation optical modules and great processing power. Capable of synchronizing with the Downstream and Upstream data flow of the GPON fibre, performing automatic calibration, and allowing long length captures. It also **extracts and decrypts in real-time Ethernet traffic** from the upper layer, allowing to regenerate services like video or VoIP.

The Analysis Software interprets the captured data and allows the operator to inspect the control flow from the first to the last frame, selecting and filtering data following configurable criteria. It also analyses the content of the control information inferring the topology and state of a GPON network: ONTs detected, data channels established, configuration exchanged, **OMCI E/R diagram, bandwidth analysis, and graphics for every ONT and by TCONT.**

Very intuitive and usable, with a very low learning curve that lets you use it right from the start.

FEATURES

Capture+Analyze+Evaluate in 1 click

Starting from the captured data, GPON Doctor is capable of inferring the network topology and applying a series of rules to verify the compliance with the ITU-T G. 984.x and G.988 recommendation. Its automatic adaptive synchronization, automatic calibration and easy interface makes it easy to use from the first day.

Precise detection of problems in a GPON network

Evaluates and detects problems in a GPON, detailing the equipment and the cause of the malfunction.

Real time user traffic extraction

GPON Doctor 2000 extracts, decrypts and reassembles user traffic at Ethernet layer, in real time. This traffic is made available at the 10/100/1000BaseT interface. Possible applications are: QoS/QoE monitoring, network performance and upper layer analysis. Its hardware decoder fully supports AES automatic decryption combined with FEC.

Service regeneration and QoS/QoE Evaluation

GPON Doctor™ 2000 can regenerate services established over a PON network. i.e. Multicast video can be sniffed & reassembled in realti time and watched on GPON Doctor 2000 screen. This feature is perfect to evaluate QoS and QoE of configured services over a PON.

Real time operation

GPON Doctor™ 2000 captures GTC and OMCI messages over the fibre in real-time to help to keep track of negotiation processes and configurations, showing in real-time the status of ONTs, GEM ports and TCONTs.

Detailed diagrams of OMCI entities and BW allocation

Easy to understand and complete entity-relation OMCI diagram, including alarms and errors. Bandwidth allocation per ONT and TCONT and its evolution in time. Real time Upstream bandwidth consumption per GEM port.

Troubleshooting GPON networks

With the aim of reducing the ONTs price it is important that any OLT is capable to interact with any ONT regardless its manufacturer.

However, GPON has a number of intrinsic characteristics that could make difficult the interoperability among manufacturers:

- Commercial implementations from earlier versions of the standard.
- Problems during the activation process.
- Misinterpretation of the standard.
- OMCI, a very broad standard.
- Heterogeneity among operators.
- Attenuation in a GPON circuit can be very high due to the sum of fibre spliting, connectoriztion (Insetion loss), fusion splice, and distance in the fibre.

All these factors imply a great challenge in the deployment of GPON networks.

Non invasive Capture

Once a Network is deployed, it is required that the usage of a test tool does not impact in its behaviour. Therefore, GPON Doctor™ 2000 transparently sniffs traffic within a FTTH network. Moreover, its automatic calibration and stand alone configuration enables full capture of GPON network traffic without disturbing the communication between the OLT and ONTs.

The capture can be very long and allows captured data export to XML format for later analysis in desktop computers.

Smart Network analysis and evaluation

The smart analysis software interprets the captured data and translates it into a graphical and categorized format that can be easily used for in-depth analysis of GPON protocol conformance, interoperability evaluation, bandwidth assignments and field deployment troubleshoting.

The data captured by the GPON Doctor are analysed to enable the view of:

- GPON network topology: ONTs detected, ONTs and OLT operational status, data channels established,
- Entities created and the detailed relationships among them, including errors and alarms generated.
- Bandwidth assignment graphics per ONT and TCONT, and its evoltion in time.
- Degree of standard compliance, by applying an evaluation system for the ITU-T G.984.x and G.988 recommendation based on contextualized dynamic rules.

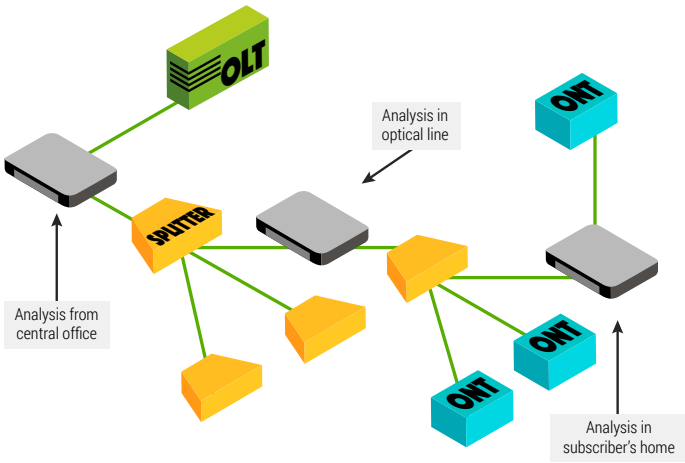
Real time upper layer Ethernet traffic extraction

GPON Doctor 2000 allows clear-text user traffic extraction in real-time for both upstream and downstream. The traffic is extracted at Ethernet layer.

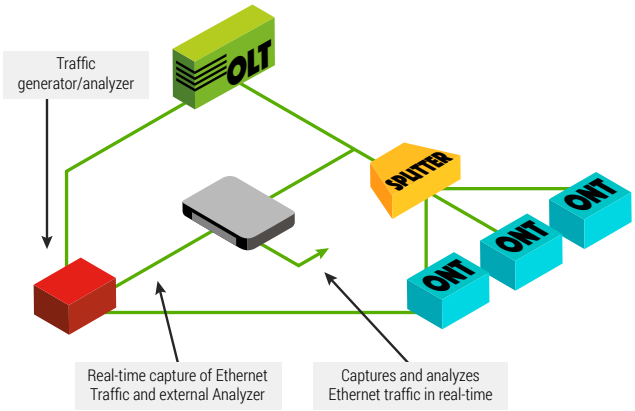
This traffic can be further analysed by upper layer protocol analysers, either external or by a network protocol analyser software installed within the GPON Doctor.

The combination of the GPON Doctor with a traffic generator and an external or internal analyser is a powerful setup to verify the correct transmission of data over the network.

This feature can be also used to regenerate in real-time services in GPON Doctor itself: watching Multicast Video flows in its screen, hearing sound of voice services, analyse QoS & QoE, etc.



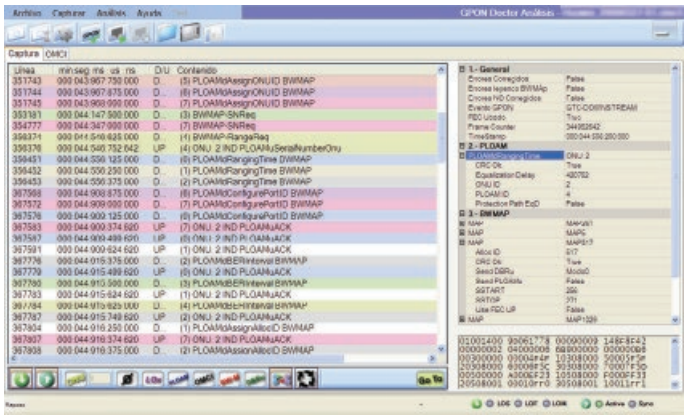
Analysis and identification in GPON Networks



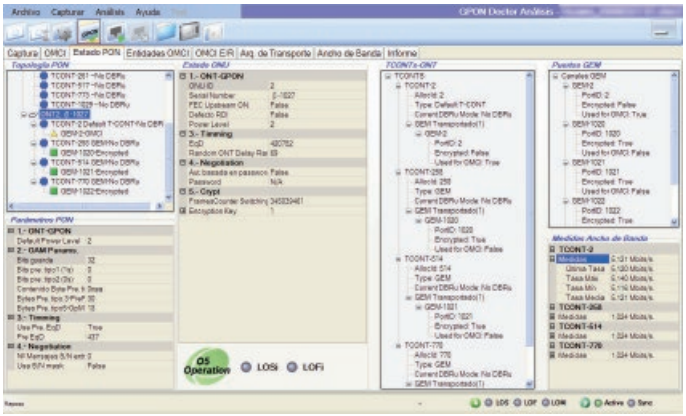
Real-time user traffic extraction

APPLICATIONS

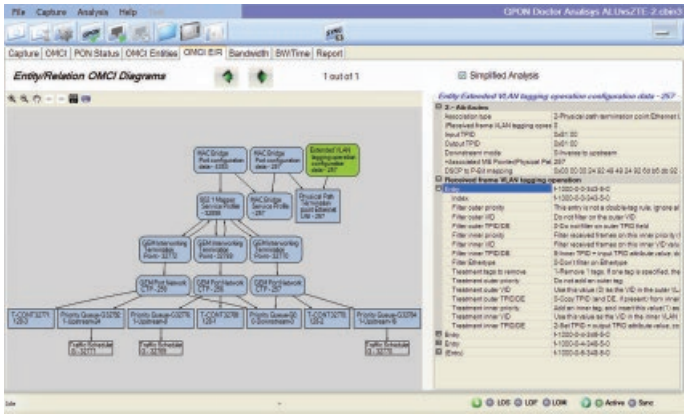
Start screen



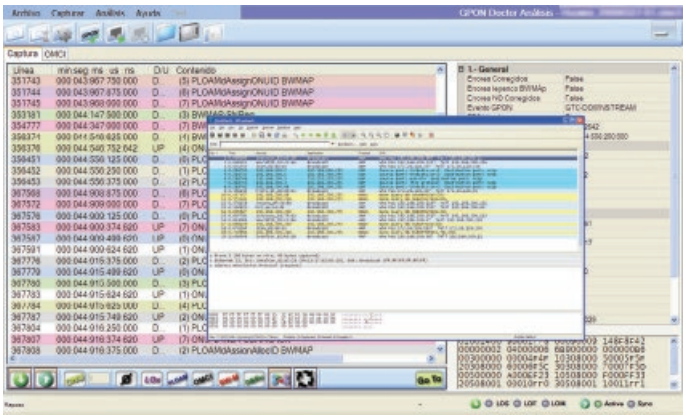
Control traffic analysis GPON G.984.3 and G.988



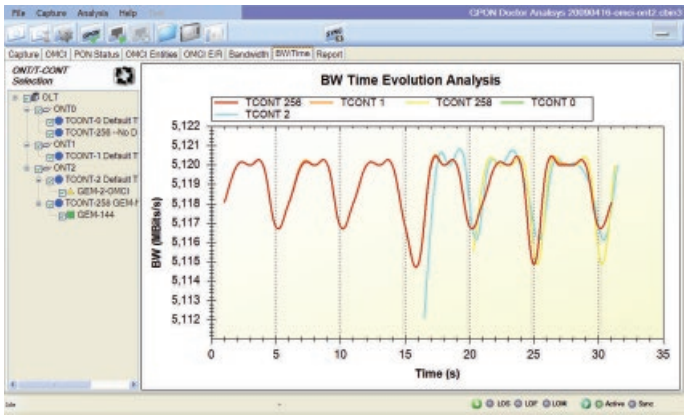
ONTs GPON state (GTC and OMCI)



Entity/relation diagram of OMCI entities



Real Time Extraction using Industry standard application



Analysis of bandwidth distribution per ONT and TCONT

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TECHNICAL SPECIFICATIONS

Application examples

GPON problems identification in an FTTH network.

Interoperability troubleshooting among different vendors equipment coexisting in a Telco access network.

Diagnosis and Analysis of events, alarms and errors in already deployed GPON networks.

Evaluation of protocol compliance during the development of GPON OLTs and ONTs.

Analysis of user traffic and evaluation of quality of services in the GPON networks through its Ethernet interface.

GPON 984.x and G988 interoperability test.

Fundamental tool for GPON new network deployment, equipment development and certification.

Knowledge of the network state and all its active elements (ONTs).

Technical features

Capture OAM + PLOAM control data and OMCI messages (full support).

Real-time PLOAM + OMCI + Negotiation messages capture.

Long duration captures.

Low attenuation (<1.5 dB) internal fibre tap module, perfect for field environment or optical lab analysis.

Infers the ONTs OMCI entities state/value and sorts VLAN.

Infers network topology: ONU/ONTs, OLT.

Evaluation of the degree compliance with the ITU-G.984.x and G.988 recommendation, generating a list of inconsistencies and violations.

Bandwidth distribution analysis per T-CONT for every ONT.

Real-time Ethernet traffic extraction and services decryption, regeneration and monitoring: Multicast Video, Voice...

Adaptative synchronization and automatic calibration.

Automatic behaviour: capture, analyse and evaluate in one click.

Captures storage for further analysis by the GPON Doctor.

Size with transport case: 288 x 200 x 50 mm.

Weight: 1,8Kgs.

Power supply: 220V.

Interfaces

Gigabit Ethernet over GPON Real Time Extraction port: External network protocol analyser plug in.

GPON capture interfaces:

- Downstream: SFP Single Mode 1490nm (2,5Gbps) module, SM 1310nm optional:
- Upstream: Single Mode 1310nm (1,25Gbps).

USB 3.0 Host cable Adapter.

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CONTACT INFORMATION

GPONDoctor Scoop

Parque Tecnológico Bizkaia, Building 804-m122 - E-48160 Derio. Bizkaia (Spain)
Tel. +34 656791625 - enrique.areizaga@gpondoctor.com