VIAVI LEADING THE FIBER WAVE

GPON Testing – Challenges & Best practices

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AGENDA

- TELECOM INSTRUMENTS - Company's overview
- GPON Deployment phases
- GPON: What is next?
- Inspect before you connect
- Service Activation and Troubleshooting
  - PON PM
  - PON Analyzer
  - OTDR

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Telecom Instruments
Measurement & Telecommunication Systems

COMPANY OVERVIEW

- Founded in 2009
- Headquarter in BUCHAREST
- We offer Test & Measurements and Monitoring solutions
- Active in the Telco, Gov. and Enterprise area
- Member of **IBIS INSTRUMENTS**, with presences in 7 countries

VIAVI

Microsemi

narda
Safety Test Solutions
an L3 communications company

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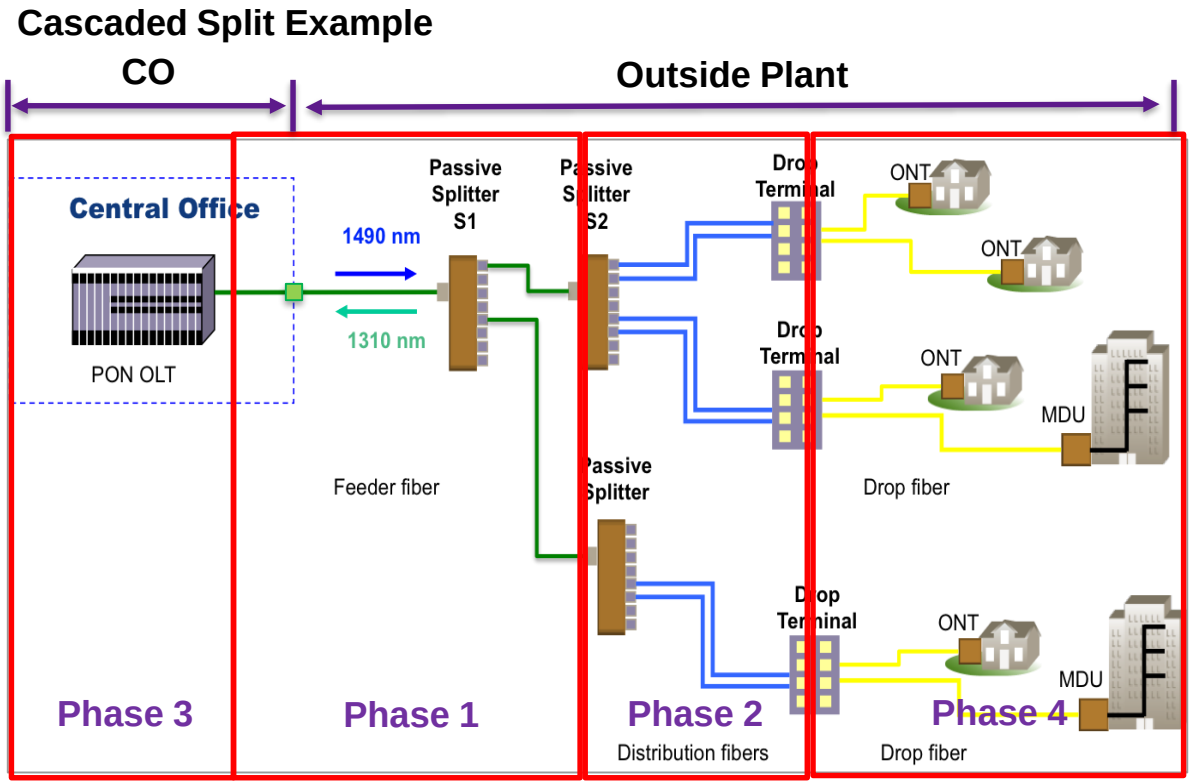
Network Deployment phases



Recommanded Fiber Test Tools for Construction: Phase 1 & 2:

1. VFL (Phase 2)
2. Fiber Inspection Probe + Cleaning Tools
3. 1310/1550nm Laser Source & Broadband Power Meter (two-ended tester)
4. 1310/1550nm OTDR
5. Bidir OTDR for splices and different fiber types (Phase1)

Recommanded Fiber Test Tools for Service Activation and Troubleshooting

1. Fiber Inspection Probe + Cleaning Tools
2. PON PM / PON Analyzer
3. In Service OTDRs (1625nm , 1650nm with filter)

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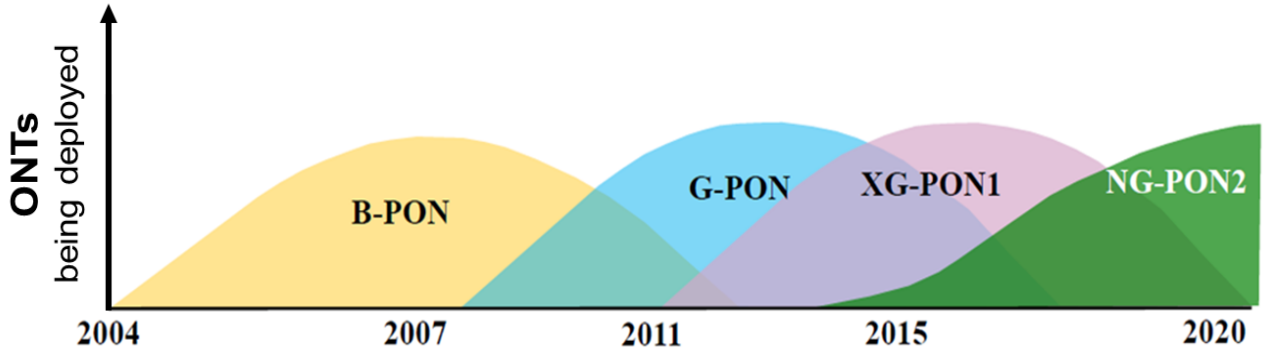
PON Evolution



	G-PON	XGPON1	NG-PON2 TWDM-PON
Standards	ITU-T G.984 (2003)	ITU-T G.987 (2011)	ITU-T G.989 (2015)
Bandwidth DS/US	2.4 /1.2 Gb/s	10/2.5 Gb/s	40/10 Gb/s (80/20 Gb/s)
Loss budget	17-32 dB	20-35 dB	
Splitting ratio	1:32, 1:64	1:32, 1:64 (1:128)	
Distance	20/40km (LD: 60)		
DS-Wavelength **US-Wavelength**	1490nm 1310nm	1578nm 1270nm	1596-1603nm (4/8λ) 1524-1544nm
Co-existence	N/A	YES => no modifications of TC-layer	

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Inspect Before You Connect (IBYC)

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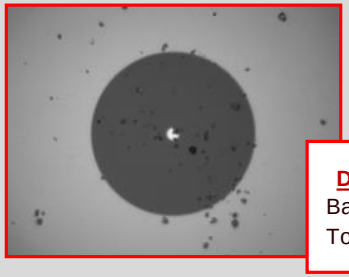
The industry recognizes fiber inspection as essential

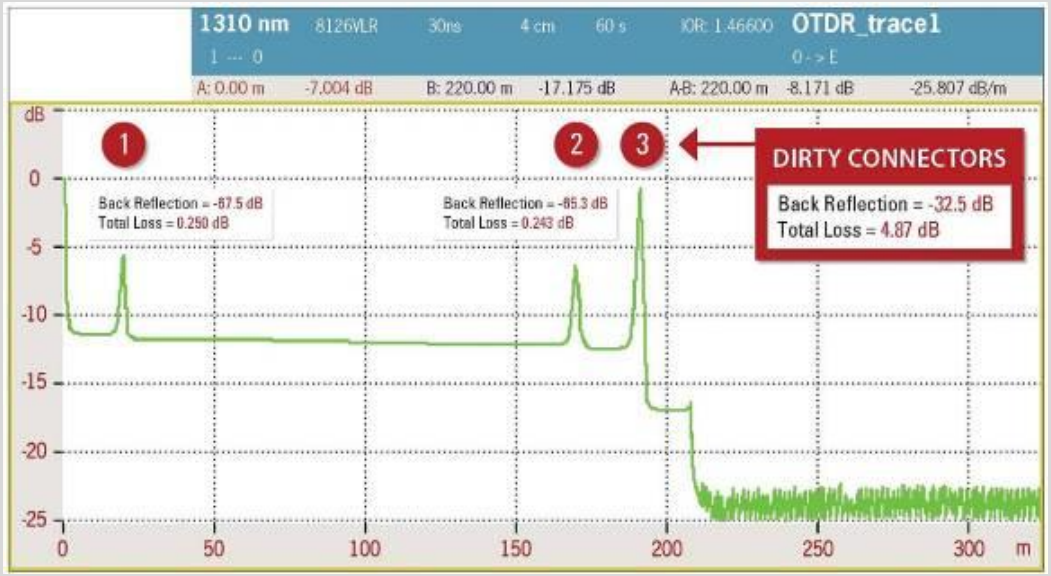
1

CLEAN CONNECTION
Back Reflection = **-67.5 dB**
Total Loss = **0.250 dB**



3

DIRTY CONNECTION
Back Reflection = **-32.5 dB**
Total Loss = **4.87 dB**



Technicians can't afford NOT to IBYC…however it is still considered a pain!

- **Too many tools to carry**
- **Fiber Inspection takes too long**
  - More connectors = more time to inspect
  - Test workflows are slowed down
  - Can double the time on a job site
  - Added time to document and save records

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Inspection: P5000i

- Repeatable PASS/FAIL inspection results for connector end faces
- Certifies to industry standards or customer specifications
- Compatible with multiple devices
- Now connect to Android devices with FiberChekMOBILE

P5000i
Digital Analysis Microscope

PC/Laptop

SmartClass Fiber

TBERD 2K/4K/6K

HST-3000

Android Devices

MTS 5800

Certifier40G

DSAM

CellAdvisor

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Service Activation and Troubleshooting

-PON PM
-PON Analyzer
-OTDR

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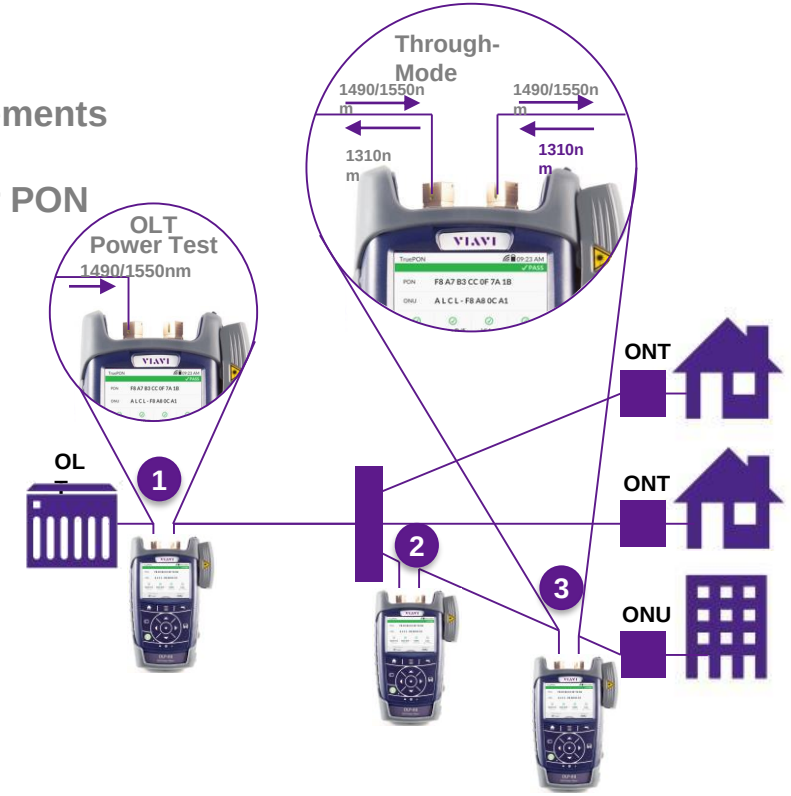
FTTH: Network Service Activation & Troubleshooting

Perform measurements and verifications anywhere in your PON network

1. Central Office site (OLT)
2. Splitter cabinet
3. Customer site (ONT/ONU)



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OLP-87 G-PON Power Meter with Connector Inspection

- Simultaneous power measurement at upstream 1310 nm & downstream 1490 nm, 1550 nm on live PON networks
- Burst mode function for precise power measurement of upstream at 1310 nm
- Auto PASS/FAIL analysis
- Data transfer & remote control via USB interface

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OLP-87 XG-PON Power Meter with Connector Inspection – ready for the future!

- Combines G-PON & **XG-PON** Power level measurements in a single unit

- **Simultaneous** power measurement at upstream **1270, 1310 nm** & downstream **1490 nm, 1550, 1578 nm** on live XG-PON networks

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OLP-88 TruePON Tester
Bringing PON Testing to the Next Level

- The **OLP-88 *TruePON*** is a new generation of PON tester performing:
  - PON power level measurements with auto pass/fail analysis
  - Fiber endface inspection with auto pass/fail analysis

NEW

- The built-in **GPON data analysis** enables
  - Verification of ONU/ONT activation process
  - Identification of ONU/ONT serial number
  - Detection of Rogue ONUs/ONTs and Alien devices

NEW

- For **GPON systems carrying PON-ID, it performs**
  - Real time, in-service ODN insertion loss measurements
  - Auto setting of pass/fail thresholds based on ODN class
  - Identification of OLT-ID

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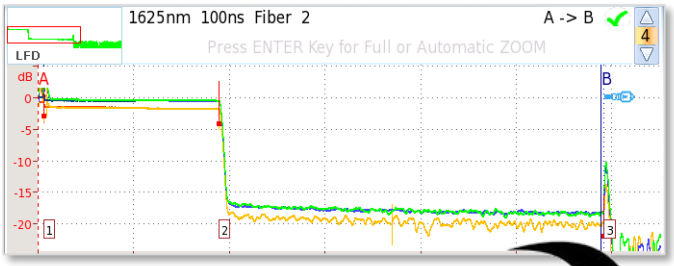
OTDR: What's new? Easy Interpretation of results

- Selects optimized test parameters to conduct reliable measurements through optical splitters & to detect close events near the start (Central Office splices/ connectors) **(Multi Pulses Automatic Algorithm)**

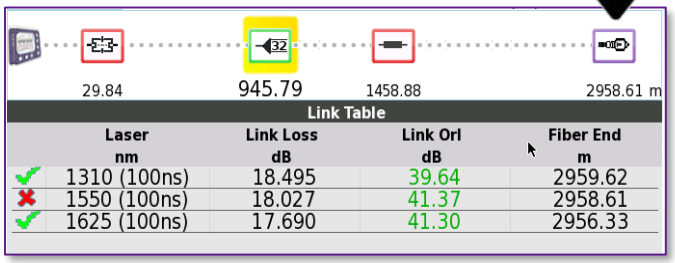
- Iconically displays a map of OTDR trace results **(SmartLink View)**



OTDR Trace

- Guarantees measurements with automatic PASS/FAIL analysis to ITU-T/IEEE PON standards or customer-defined specifications

- Automatically identifies all network elements such as PON splitter types/ratios **(Discover Mode)**



Laser nm	Link Loss dB	Link Orl dB	Fiber End m
1310 (100ns)	18.495	39.64	2959.62
1550 (100ns)	18.027	41.37	2958.61
1625 (100ns)	17.690	41.30	2956.33

Smart Link View (icons)

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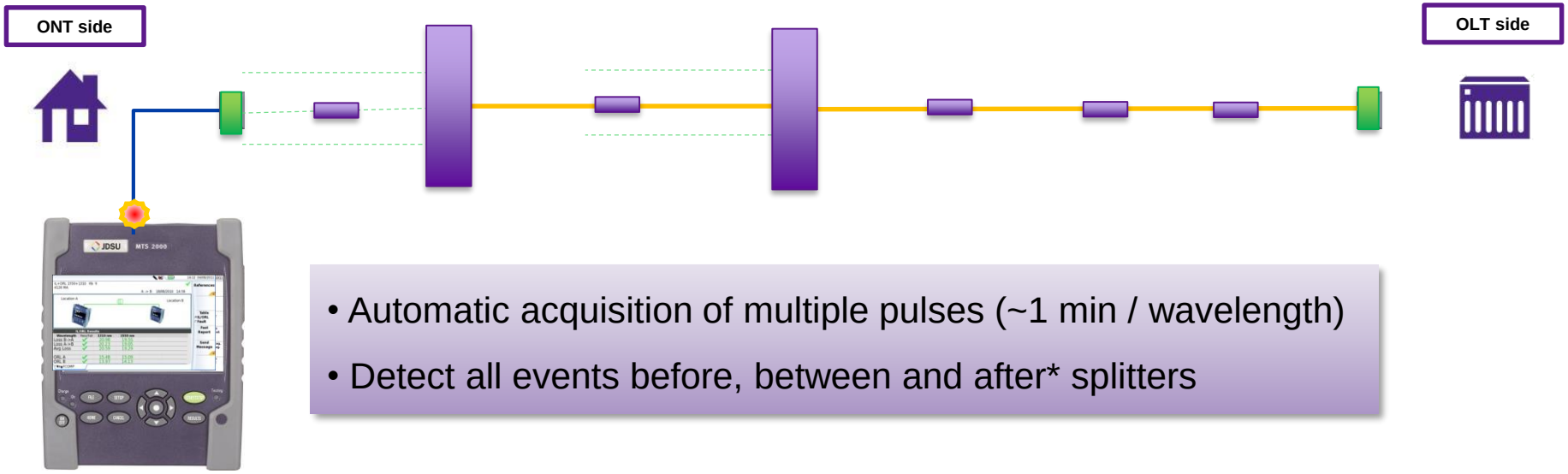
VIAVI FTTH-SLM



- Automatic acquisition of multiple pulses (~1 min / wavelength)
- Detect all events before, between and after* splitters

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FTTH-SLM – Trace Display by Sections

- Simplified display to better handheld multi-pw traces (up to 18)
- Display only the “useful” traces and sections (cut section of traces)
- Ex: The 7 events detected are coming from 3 acquisitions, a combined curved is created showing only the 3 useful sections.

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Fiber Optics NewGen OTDR Modules

PRODUCT RELEASES:

- New **MA3(43dB) and MP2(45dB) OTDR modules**

Leadership position on the OTDR market

- Best-in-class optical performance for reliable event detections
- Affordable high performance (45dB) OTDR for long-haul and metro high speed fiber links
- Best dynamic range / resolution ratio on the market to characterize high-count PON splitter network (Splitters 1:128)

Unique valued features

- SLM Apps and SmartAcq turn any technician into an instant fiber expert
- Improved productivity with faster FiberComplete measurement
- Compatibility with MTS-2000/4000 and 5800v2 offers a unique competitive advantage with Ethernet (10/100G) and OTDR (Metro/Long-Haul) in a single unit

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