

# Fiber Access Networks

## 1. Mission Statement:

To define the requirements and data models for deploying Broadband Forum network architectures in fiber access technologies so as to accelerate deployments and ensuring interoperability.

Work Area Director: [Marta Seda](#), Calix

## 2. Business Impact:

This Work Area's focus along with the Physical Layer Transmission area is on both cost savings and acceleration of time to market. Standardized interoperability and certification create a trusted base of equipment and services without which significant investments in time and resources can cause years of delay and in-service failures that impact revenue and credibility. Interoperability provides invaluable intelligence as feedback to both developers and implementers of new products and services. As the move to virtualized devices with non-deterministic functions and performance becomes a reality, the need for interoperability testing, data models, and reference configurations will become critical.

## 3. Scope:

The FAN Work Area has the following main areas of responsibility:

- Specification of PON related requirements. These projects include:
  - Architecture & Technical Requirements for PON-based Mobile Backhaul networks
  - Multi-wavelength PON Inter-Channel-Termination Protocol Specification
  - Multi-service Broadband Network Architecture and Nodal Requirements in the context of PON
- Specification of PON NETCONF/YANG data models for the defined YANG modules
- Specification of PON test suites used to verify the interoperability of the fiber access specific portions of the network. These projects include:
  - G-PON & XG-PON & XGS-PON ONU Conformance Test Plan
  - XGS-PON TC Layer Test Plan
  - NGPON2 Test Plan
  - PMD Layer Test Plan.

### 3.1. To find contributions, please search in JIRA:

1. [Click here to access the Jira CONTRIB project.](#)
2. Click the "More" drop-down menu filter.
3. Select "BBF Project".
4. In the new "BBF Project:" menu filter that pops up, type the project number including prefix, e.g., "WT-385", "ID-247", etc.

### 3.2. Project Streams

| Project Stream | Description | PS Leadership |
|----------------|-------------|---------------|
|----------------|-------------|---------------|



## Fiber Access Networks Work Area Email List

[memgen@broadband-forum.org](mailto:memgen@broadband-forum.org)

- List for all BBF Members to receive general information

[fan@broadband-forum.org](mailto:fan@broadband-forum.org)

- List for BBF Fiber Access Networks WA

[wt385@broadband-forum.org](mailto:wt385@broadband-forum.org)

- This email list is for discussions related to WT-385 "xPON YANG Modules" a document being developed by the Fiber Access WA PON Management PS

[ictp@broadband-forum.org](mailto:ictp@broadband-forum.org)

- This email list is for the WT-352 "Inter-channel-termination protocol (ICTP)" a project being developed by Fiber Access WA NGPON2 Wavelength Management PS

For instructions on how to join /leave these exploders, please refer to [Join or Leave BBF Groups and Email Lists](#)

[FAN Agendas & Meeting Minutes](#)

**Pages in this space**

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| Non-PS Assigned | Projects that don't fit under the scope of an existing Project Stream or if they fit under the scope of more than one Project Stream, are developed under the Non-PS Assigned category. | Vacant, managed by FAN WA Directors. |
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| Project Stream                            | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | PS Leadership                         |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| <a href="#">Interoperability and Test</a> | <p>Interoperability project stream is dedicated to PON system interoperability of telecom services over multi-vendor and multi-carrier inter-connections. The Interoperability project stream has also added OLT NETCONF management interoperability between OLT NETCONF server interfaces and third-party NETCONF clients such as an SDN controller.</p> <p>Interoperability and test project is responsible for creating test cases documents for vendor certification and conformance. Both vendors and operators benefit from these documents as they describe agreed-upon use cases to support. Being able to exchange information between devices and management applications is crucial for the modern economy.</p> | <a href="#">Vincent Buchoux</a> , LAN |

| Project Stream                               | Description                                                                                                                                                                                                                                                                                                      | PS Leadership |
|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|
| <a href="#">NGPON2 Wavelength Management</a> | The NGPON2 Wavelength Mobility Management project stream is dedicated to the development of NGPON2 Inter-Channel Termination Protocol (ICTP) for interoperability among suppliers of the TWDM and PTP WDM NG-PON2 subsystem, as well as the suppliers of the TWDM CTs for business and residential applications. | Vacant        |

| Project Stream                                                           | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | PS Leadership                    |
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| <a href="#">PON Abstraction Interface for Time-critical Applications</a> | For flexible and agile service adaptation at a low cost in the next-generation optical access system, a new system architecture, which is based on SDN/NFV technologies, should be required. The most promising way to pursue the new architecture is disaggregating PON functions to functional modules with open interfaces. The project propose a new work item to progress the architecture further by specifying a PON abstraction interface for time-critical processing functions, e.g. Dynamic Bandwidth Assignment (DBA), which is not covered existing BBF documents and on-going projects. | <a href="#">Kota Asaka</a> , NTT |

| Project Stream            | Description                                                                                                                                                                            | PS Leadership |
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| PON Based Mobile Backhaul | The PON based Mobile backhaul project stream is dedicated to the development of PON based Mobile backhaul use cases, mobile system general requirements as well as nodal requirements. | Vacant        |

| Project Stream                 | Description                                                                                                                                                                                                                               | PS Leadership                         |
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| <a href="#">PON Management</a> | The PON Management Project Stream is dedicated to the development of NETCONF management models to manage ITU-T and IEEE PON YANG models. Common PON model promote interoperability between NETCONF servers and 3rd party NETCONF clients. | <a href="#">Joey Boyd</a> ,<br>ADTRAN |

| Project Stream | Description                                                                                                                                                                                                                                                                                                                                                                                                                 | PS Leadership                             |
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| G.HSP 50G-PON  | <p>This project stream is dedicated to the development of requirements, and coordination of updates to BBF YANG data model and interop test cases for this new technology (when an active FAN PS leader or active working text editors exists).</p> <p>Note that <a href="#">BBF Specifications Potentially Impacted by HSP (Work in Progress)</a> studied the impact of G.HSP as a new technology on BBF deliverables.</p> | <a href="#">Samuel Chen</a> ,<br>Broadcom |

| Project Stream | Description                                                                                                                                                  | PS Leadership                                   |
|----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| 25GS-PON       | This project stream is dedicated to the development of requirements, and coordination of updates to BBF YANG data model and interop test cases for 25GS-PON. | <a href="#">Frank Van der Putten</a> ,<br>Nokia |

### 3.3. Projects in Progress for this Work Area

#### 3.3.1. In-Progress

| WT /MD /SD# | Project Stream | Abstract | Related Contributions | Editor (s) |
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| <p>WT-385<br/>Issue 3,<br/>Amd 1</p> | <p>YANG<br/>Modules<br/>for PON<br/>Management</p> | <p>This working text defines the NETCONF YANG model for following PON systems:</p> <ul style="list-style-type: none"> <li>• ITU-T GPON, XGS-PON, NGPON2, HSP</li> <li>• MSA 25G MSA</li> </ul> | <div>  <p>CONTRIBUTION - Jira project doesn't exist or you don't have permission to view it.</p> </div> | <p>Robert<br/>Peschi,<br/>Nokia</p> <p>Kevin<br/>Noll,<br/>Vecima</p> |
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| <p>WT-489 Issue 1, Amd 1</p> | <p>Authentication of an ONU and selection of eOMCI or vOMCI</p> | <p>WT-489 covers requirements concerning the authentication of ONUs and the decision whether it should rely on eOMCI or vOMCI.</p> | <div>  <p>CONTRIB-24248 - Jira project doesn't exist or you don't have permission to view it.</p> </div> | <p>Robert Peschi, Nokia</p> |
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| WT-423, Issue 3 | PMD Layer Test Plan       | <p>TR-243 defines new PON PMD measurement techniques and the test plan for use in PON PMD Conformance testing. Executing these test cases as part of a multi-supplier test event will help OLT's and ONU's implement the specifications so as to operate as a functional PON system.</p> <p>WT-423 Issue 3 adds test cases related to support of ITU-T HSP G.9804 TDM and G.9807.1.</p>                    | <br>CONTRIBUTION - Jira project doesn't exist or you don't have permission to view it. | Hugh Singleton, BT   |
| DTP-247 Issue 5 | PON Conformance Test Plan | <p>TP-247 Issue 5 provides a test plan that may be used to verify conformance of a G-PON / XG-PON / XGS-PON ONU to the requirements defined in TR-156 and TR-280. Additionally, this test plan verifies that the OMCI implementation contained in a G-PON / XG-PON / XGS-PON ONU adheres to the practices described in Appendix I and II of G.988</p> <p>DTP-247 adds ITU-T HSP G.9804 TDM test cases.</p> |                                                                                                                                                                           | Vincent Buchoux, LAN |

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| WT-142<br>Issue 5 | Framework for CWMP and USP enabled PON Devices |  | <br>CONTRIBUTOR - Jira project doesn't exist or you don't have permission to view it. | Vacant |
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| <p>WT-156<br/>Issue 5</p> | <p>Using PON Access in the context of TR-101</p> |  | <div data-bbox="1154 138 1343 1339" style="border: 1px solid orange; padding: 10px;">  <p>CONTRIBUTOR - Jira project doesn't exist or you don't have permission to view it.</p> </div> | <p>Vacant</p> |
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| <p>WT-280<br/>Issue 4</p> | <p>PON in the context of TR-178</p> |  | <div>  <p>CONTRIBUTOR - Jira project doesn't exist or you don't have permission to view it.</p> </div> | <p>LEBRAS<br/>Hugues<br/>, Orange</p> |
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| <p>WT-331<br/>Issue 2</p> | <p>Architecture and Technical Requirements for PON based Mobile Backhaul Networks</p> |  | <div>  <p>CONTRIBUTION - Jira project doesn't exist or you don't have permission to view it.</p> </div> | <p>Samuel Chen ,<br/>Broadcom</p> |
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| <a href="#">WT-505</a><br><a href="#">Issue 1</a> | ONU Management at Scale | This working text defines the NETCONF YANG model for ONUs in a combined NE mode. | <div data-bbox="1252 180 1289 216"></div> <div data-bbox="1243 226 1304 1291">           CONTRIBUTION-23786 - Jira project doesn't exist or you don't have permission to view it.         </div> | <a href="#">Robert Peschi</a> , Nokia<br><br><a href="#">Joey Boyd</a> , Adtran |
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| WT-509 | YANG modules for Cooperative Dynamic Bandwidth Assignment | <p>This Working Text describes the YANG data models for Cooperative DBA (CO DBA) and Cooperative Transport Interface (CTI) server in ITU-T Passive Optical Networks (PON) OLT devices as defined in ITU-T G.984.x, ITU-T G.987.x, ITU-T G.989.x, ITU-T G.9807.x, ITU-T G.9804.x. The data models described in this working text address the Optical Line Termination (OLT). This data model reuses and in some cases augments existing IETF and BBF YANG models in TR-385 [1]. The support of CO DBA and CTI Server functionality in the OLT are optional.</p> | <div>  <br/> CONTRIBUTION - Jira project doesn't exist or you don't have permission to view it. </div> | <a href="#">François Fredricx</a> , Nokia |
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| WT-512 | PON OMCI SMA as EAP-OMCI Method | <p>This Working Text maps the OMCI conventional three step sequence into the EAP framework defined in [IETF RFC 3748], as a new EAP method, referred to as EAP-OMCI. The EAP-OMCI method targets as close an alignment as possible with the EAP-GPSK method, while complying with the OMCI SMA defined in [ITU-T G.988] clause 9.13.11.</p> | <div data-bbox="1252 184 1289 220"></div> <div data-bbox="1243 231 1304 1293"> CONTRIBUTION - Jira project doesn't exist or you don't have permission to view it. </div> | <div data-bbox="1360 142 1450 294"> Frank Van der Putten<br/>Nokia </div> |
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| WT-514 | OLT PON Management at Scale | <p>This Working Text scope includes:</p> <ul style="list-style-type: none"> <li>deriving from existing WT-385 YANG modules, the development of modules that augments the template and generate-from-templates data nodes there by enabling representation of recurrent patterns of PON management data, for instance: <ul style="list-style-type: none"> <li>a vANI and its related OLT-vENET interfaces could be defined in distinct modules that can be indifferently used in templates and instances modules.</li> </ul> </li> <li>derive new groupings of pon management data-nodes, as like the ones for common YANG, and reusing it across templates, generate-from-template instances and existing modules defined under wt-385, wt-505 projects.</li> </ul> <p>Reference NPIF: <a href="#">Proposed NPIF - Common YANG: Large System Management at Scale</a></p> | <br>CONTRIBUTION - Jira project doesn't exist or you don't have permission to view it. | <a href="#">Jian Zhu</a> , Huawei<br><br><a href="#">Robert Peschi</a> , Nokia |
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### 3.3.2. Projects in Straw Ballot or Final Ballot

Please refer to [All Ballots](#) for latest status of these documents.

| WT /MD /SD# | PON Management Projects | Abstract | Related Contributions | Editor (s) |
|-------------|-------------------------|----------|-----------------------|------------|
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| DTP-247, Issue 4, Corrigendum 1 | PON Conformance Test Plan | <p>DTP-247 Issue 4 provides a test plan that may be used to verify conformance of a G-PON / XG-PON / XGS-PON ONU to the requirements defined in TR-156 and TR-280. Additionally, this test plan verifies that the OMCI implementation contained in a G-PON / XG-PON / XGS-PON ONU adheres to the practices described in Appendix I and II of G.988</p> <p>This document is a corrigendum to TR-247 Issue 4.</p> | <br>CONTRIB-23529 - Jira project doesn't exist or you don't have permission to view it. | Vincent Buchoux, LAN |
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| DTP-255 Issue 2 | GPON Interoperability Test Plan | <p>WT-255 Issue 2 is a BBF GPON/XGS/XG Interoperability test plan that describes a series of test cases that may be used to verify the interoperability of an OLT and ONU pairing according to the functional requirements of BBF TR-156, TR-280, and ITU-T G. 988. It is intended that these test cases be used with an ONU already awarded the BBF.247 GPON ONU Certification and an OLT known to use standardized OMCI managed entities to implement the configuration under test.</p> | <div data-bbox="1252 184 1289 220"></div> <div data-bbox="1243 231 1302 1293"> CONTRIBUTION - Jira project doesn't exist or you don't have permission to view it. </div> | Justin Nelson, UNH-IOL |
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| <p>WT-309 Issue 3</p> | <p>PON TC Layer Test Plan</p> | <p>TR-309 is the verification of XG-PON and XGS-PON OLT and ONU interoperability with respect to the TC sub-layer (ITU-T G.987.3, ITU-T G.9807.1 Annex C), and, indirectly as a result of testing the TC layer, to the PMD sub-layer (ITU-T G.987.2, ITU-T G.9807.1 Annex B).</p> <p>WT-309 Issue 3 merges WT-309 Issue 2 Amd 1 test cases and adds ITU-T HSP (G.9804) TDM and MSA 25 GS-PON test cases.</p> | <div>  <p>CONTRIBUTION - Jira project doesn't exist or you don't have permission to view it.</p> </div> | <p>Frank Van der Putten, Nokia</p> <p>Akiva Sadovski Broadcom</p> |
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| WT-385, Issue 3 | PON YANG | This working text defines the NETCONF YANG model for PON Systems. Data modelling language can be used to model configuration and state data of network elements. A standards based model promotes interoperability between NETCONF servers and 3 <sup>rd</sup> party NETCONF clients (e.g., SDN controllers). | <br>CON<br>T<br>RIB<br>-23<br>608<br>-<br>Jira<br>proj<br>ect<br>doe<br>sn't<br>exi<br>st<br>or<br>you<br>don<br>'t<br>hav<br>e<br>per<br>mis<br>sio<br>n<br>to<br>vie<br>w<br>it. | Robert<br>Peschi,<br>Nokia<br><br>Kevin<br>Noll,<br>Vecima |
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#### 3.4. Recently Completed Projects for this Work Area

| WT<br>/MD<br>/SD#<br><br>(JIRA<br>Link) | PON<br>Management<br>Projects | Abstract | Related Contributions | Editor<br>(s) |
|-----------------------------------------|-------------------------------|----------|-----------------------|---------------|
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| <a href="#">WT-489</a><br><a href="#">Issue 1</a> | Authentication of an ONU and selection of eOMCI or vOMCI | WT-489 covers requirements concerning the authentication of ONUs and the decision whether it should rely on eOMCI or vOMCI.                                                                    |  <a href="#">CONTRIB-23126</a> - Jira project doesn't exist or you don't have permission to view it. | <a href="#">Robert Peschi</a> ,<br><a href="#">Nokia</a>                                                               |
| <a href="#">WT-385</a><br><a href="#">Issue 3</a> | YANG Modules for PON Management                          | <p>This working text defines the NETCONF YANG model for following PON systems:</p> <ul style="list-style-type: none"> <li>• ITU-T GPON, XGS-PON, NGPON2, HSP</li> <li>• MSA 25G MSA</li> </ul> |  <a href="#">CONTRIB-23608</a> - Jira project doesn't exist or you don't have permission to view it. | <a href="#">Robert Peschi</a> ,<br><a href="#">Nokia</a><br><br><a href="#">Kevin Noll</a> ,<br><a href="#">Vecima</a> |

| WT /MD /SD#<br><br>(JIRA Link)                    | Architectural Projects                                                                             | Abstract                                                                                                                                                                                                                 | Related Contributions                                                                                                                                                                     | Editor (s)                                                                                                                      |
|---------------------------------------------------|----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <a href="#">WT-280</a><br><a href="#">Issue 2</a> | Multi-service Broadband Network Architecture and Nodal Requirements (TR-178) in the context of PON | WT-280 documents a set of architectures for a broadband multi-service network, addressing typical infrastructures, topologies and deployment scenarios, and specifies the associated nodal requirements for PON Systems. |  <a href="#">CONTRIB-22789</a> - Jira project doesn't exist or you don't have permission to view it. | <a href="#">Martin Renner</a> ,<br><a href="#">Maxline ar</a><br><br><a href="#">LE BRAS Hugues</a> ,<br><a href="#">Orange</a> |

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| WT-142<br>Issue 4 | Framework for CWMP and USP enabled PON Devices | <p>The scope of TR-142 Issue 4 includes:</p> <ul style="list-style-type: none"> <li>Editorial updates from TR-142 Issue 3: <ul style="list-style-type: none"> <li>Update both text and diagrams to align with the current editions of the relevant technical specifications: from TR-069 to USP, from ACS to Controller, from TR-098 to TR-181, from G.984.4 to G.988, from 3G to 5G, etc.</li> <li>Update the References section with the current editions of the relevant technical specifications.</li> </ul> </li> <li>Remove text related to B-PON.</li> <li>Add new new requirements related to Telemetry (USP access to read-only PON parameters), and enable/disable a PON WAN interface on an integrated PON CPE with multiple WAN interfaces.</li> </ul> |  CO<br>NTRIB-23142<br>- Jira project doesn't exist or you don't have permission to view it. | Samuel Chen ,<br>Broadcom |
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| WT /MD /SD#<br><br>(JIRA Link) | Interoperability Test Assigned Projects | Abstract | Related Contributions | Editor (s) |
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| DTP-247<br>Issue 4 | G-PON & XG-PON & XGS-PON ONU Conformance Test Plan | DTP-247 Issue 4 defines G-PON & XG-PON & XGS-PON ONU test cases for TR-280 ITU-T PON compliant ONUs. Executing these test cases as part of a multi-supplier test event will help OLT and ONU's implementation of the specifications operate as a functional system. | <br>CONTRIBUTION - Jira project doesn't exist or you don't have permission to view it. | Vincent Buchoux, LAN |
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| <a href="#">WT-423</a><br>Issue 2 | PMD Layer Test Plan | Operators that plan to use ITU-T XG(S)-PON (with or without XG-PON), and NG-PON2 requested the FSAN and BBF Groups to document a PMD (Physical Media Dependent) layer test plan for Conformance Events. Executing these test cases as part of a multi-supplier test event will help OLT and ONU's implementation of the specifications operate as a functional system. | <div>  <br/> <a href="#">CONTRIB-21187</a> - Jira project doesn't exist or you don't have permission to view it. </div> | <a href="#">Hal Roberts</a> , Calix |
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### 3.5. Special Events

- 5th XGS PON Interoperability Test Event (see [CONTRIB\\_21908](#) for details)

### 3.6. Hiatus FAN Projects

Hiatus projects are BBF projects that have open tickets however no activity has occurred on this project for over a year. The following BBF FAN Projects are considered to be in a "Hiatus" status:

- WT-142 Framework for TR-69 Enabled PON Devices
- MD-396 Gigabit Access over FTTx
- WT-156: Using GPON Access in the context of TR-101
- WT-311: Fiber Infrastructure Management System: Architecture and Requirements
- WT-312: GPON Management Requirements
- WT-331: Architecture & Technical Requirements for PON-based Mobile Backhaul networks
- WT-372: Framework-for-multi-management-PON-devices
- WT-394: NETCONF-managed ONT YANG Model
- WT-395: Discovery for NETCONF-managed ONUs
- [WT-431](#)

# Moved FAN Projects

| WT /SD                 | Title                                                   | Description                                                                                                                                                                                                                                                                                      | New WA                   |
|------------------------|---------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| <a href="#">WT-414</a> | NETCONF and YANG Data Model Interoperability Test Plans | This working text defines the NETCONF test cases for OLT to 3 <sup>rd</sup> party NETCONF clients. Executing these test cases as part of a multi-supplier test event will help OLT and 3 <sup>rd</sup> party NETCONF client implementation of the specifications operate as a functional system. | <a href="#">SDN /NFV</a> |