ME4605 OLT Optical Line Termination User Manual

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Chapter 1
SUMMARY

Initially based on the rec. ITU-T G.984.x (GPON), our active network equipment solution is nowadays evolving for next generation PON architectures as defined by the recs. ITU-T G.987.x, ITU-T G.988.x and ITU-T G.698.x whether central office and/or customer premises.

Reference Point-to-Multipoint (P2MP) FTTx topology scenarios cover Fiber-to-the-Home (FTTH), Fiber-to-the-Building (FTTB), Fiber-to-the-Curb (FTTC), Fiber-to-the-cell (FTTc) and Fiber-to-the-business (FTTb) as depicted at Figure 1.

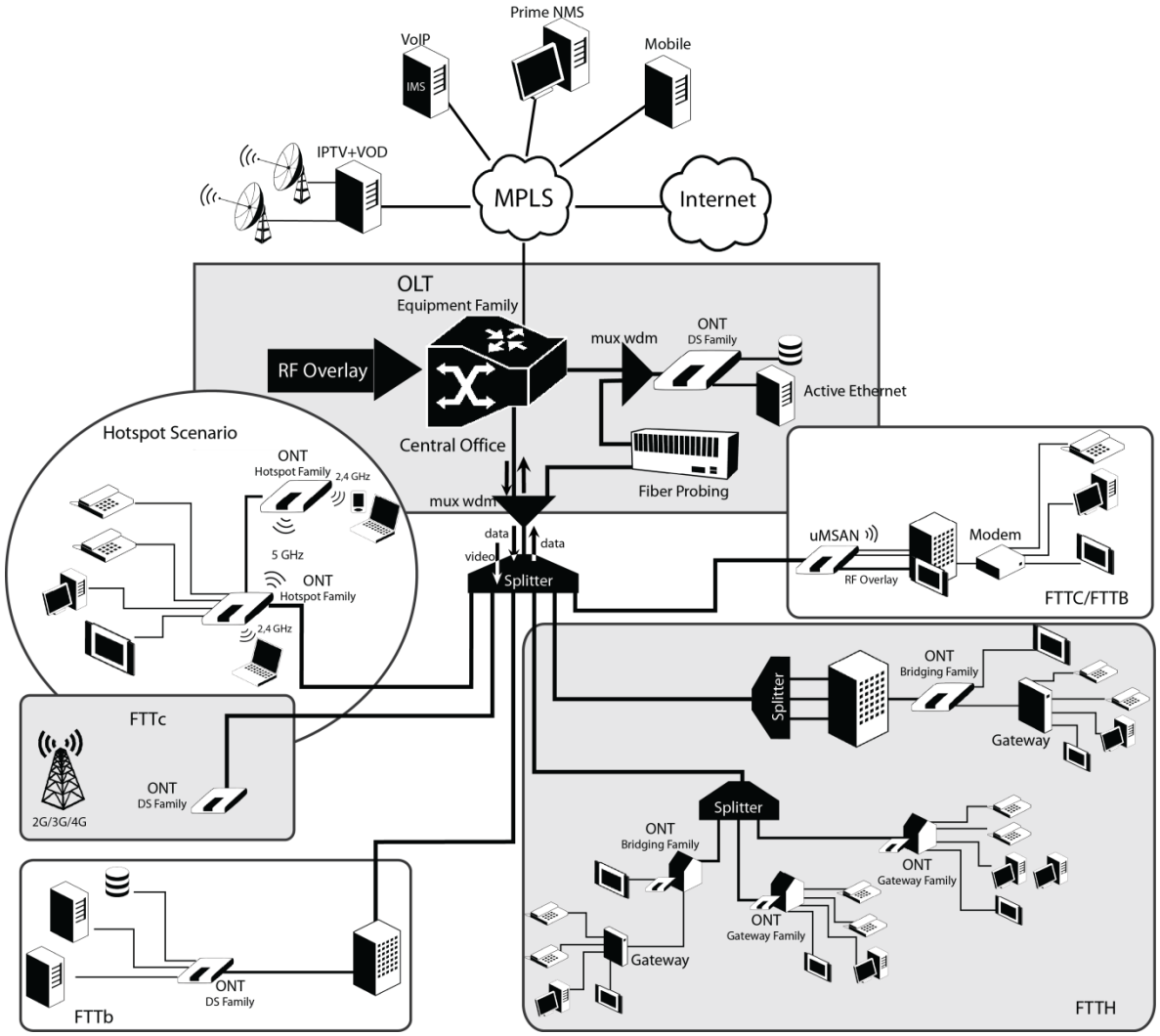
Ethernet service customers are also addressed by P2P links and Ethernet interfaces with dedicated bitrate allocation as also depicted at Figure 1.

The OLT is a high availability and high reliability high density scenario Optical Line Termination (OLT) equipment specially designed for fiber network infrastructures in Point-to-Multipoint (P2MP) FTTx Gigabit Passive Optical Network (GPON) architectures in urban deployment scenarios. Supporting up to 48 PON ports OLT can be considered the best-of-breed market offer in terms of future proof central office.

This equipment is intended to solve all your fiber access needs in terms of retail as well as wholesale clients. It complies with ITU-T G.984x and is able to serve multiplay services, namely Voice (VoIP), Data (High Speed Internet - HSI), TV (IPTV and RF Overlay) of up to 16384 client premises (assuming a 1:64 Splitting ratio) from a single chassis.

Wholesale and enterprise services are addressed through Business Ethernet VBES/TLS Services (Vlan Business Ethernet Services/Transparent VLAN Services). Up to 864 client premises can be supported at the P2P topology from a single chassis.

Figure 1. PON network architecture



Chapter 2
TECHNICAL DESCRIPTION

The OLT system is reliable modular Optical Line Termination (OLT) equipment specially devoted for fiber network infrastructures either Point-to-Point (P2P) Ethernet or Point-to-Multipoint (P2MP) FTTx Gigabit Passive Optical Network (GPON) architectures

The OLT supports Voice, Data and Video services. In parallel the transport of analog video services (RF Overlay) can be supported. Carrier class TDM services bridging is also available by means of using dedicated network termination equipments (NTA).

The OLT is a reliable high availability system that uses common element 1+1 protection (Power, Switch Fabric & Processing) and load balancing LACP at the Uplink interfaces. To guarantee security the Advanced Encryption Standard (AES) is used in the system. Multicast and IGMPv2/v3 snooping with proxy reporting are both enablers for a flexible IPTV service delivery.

Figure 2. OLT architecture

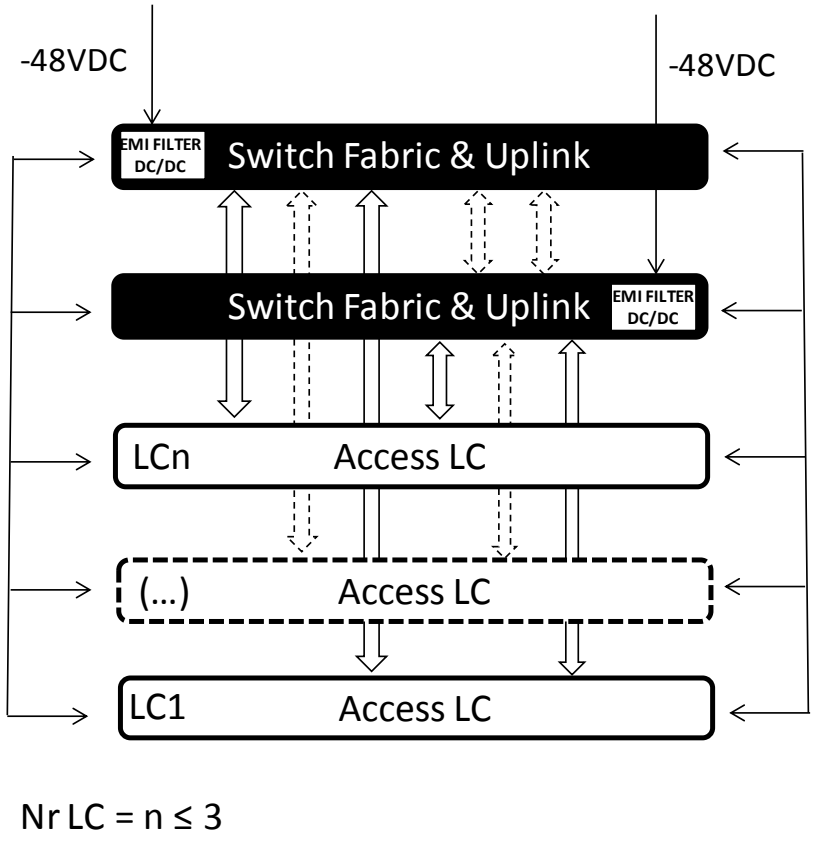


Figure 2 shows the architecture of ME4605 equipment. This consists of a closet for the placement of the two boards of switching, and linecard, a maximum of three. In this equipment the interface to the core network is implemented in switching bord.

The linecard may be any of the existing system ME4600.

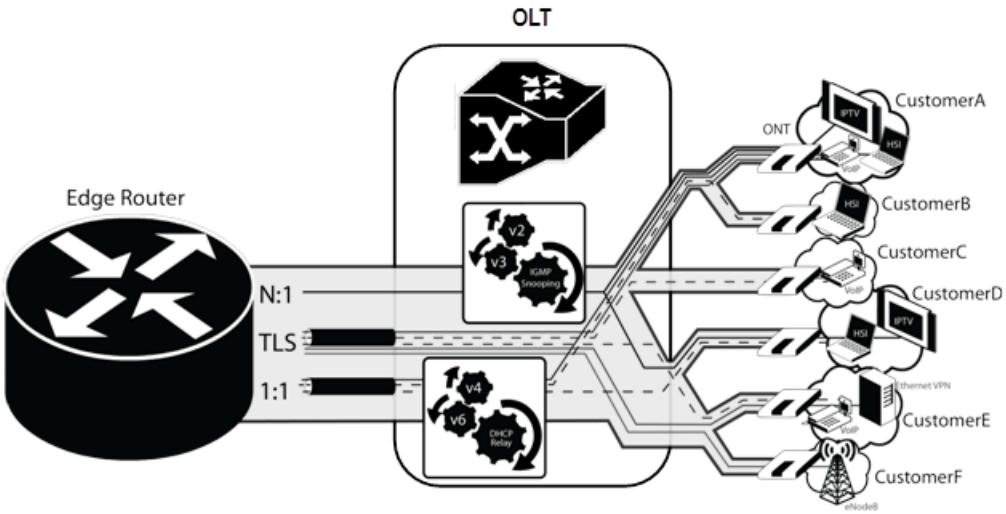
Table 1. OLT Equipment features

Features	OLT system
Chassis (ETSI 19”)	3U
Number of line card slots	3
Backplane: Physical BW per slot	12x10GbE
GPON ports	Up to 48
Active Ethernet GbE ports	Up to 144
10GbE interfaces	4

OLT SERVICES

USAGE SCENARIOS

Figure 3. OLT services Usage Scenario



The OLT system Usage services scenario include the support the provision of:

- NGN voice services: VoIP and ToIP soft switched controlled, including IP Centrex services and SIP Trunk services
- Internet services –High speed internet in the order of Mbit/s to Gbit/s, with traffic prioritization and differentiation
- Enhanced Multimedia Communications such as voice, presence, unified messaging, localization, Caller ID with IPTV, controlled by an IMS CSCF(Call Session Control Function) platform,
- Mobile Backhaul services:
    - Applicable to WiMAX, 2G, 3G and 4G (LTE) networks
    - Support transparent synchronization signals (frequency, phase and time) transport according to NTP and PTP Protocols (IEEE 1588 v2 and telecom profile)
    - Provide BITs interface for the connection of an external MHz or Mbps clock reference
- Video services:
    - IPTV
    - RF Video
- Residential multiplay services:
    - Voice: Voice over IP (VoIP);

    - Internet: High Speed Internet Services;
    - RF Overlay: Analog Video using a different wavelength (1550nm);
    - IPTV: transport of Digital Video Services;
- Business services:
    - TDM emulation services for E1 transport according to MEF-8 (CESoETH)
    - Carrier Ethernet services based on MEF 10.1 (E-LINE, E-LAN)
    - Business Ethernet Services TLS (Transparent VLAN Services)
    - BitStream (enterprise).

GPON SERVICE SCENARIOS

The OLT system supports the following Ethernet services over GPON:

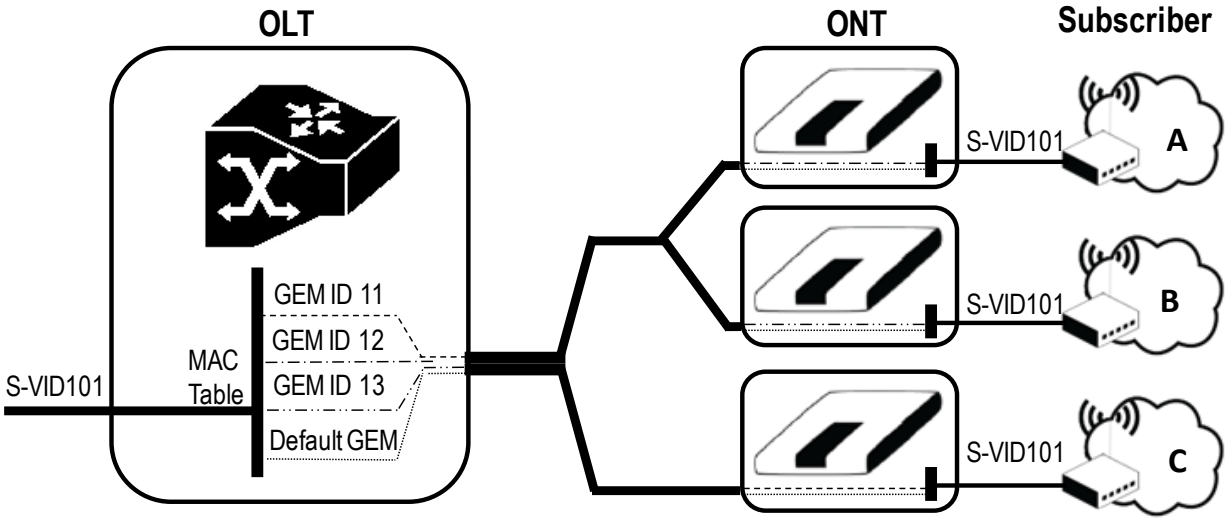
- **N:1**
    - Multiple Clients using the same Service Tag
    - Traffic Forwarding based on the S-TAG+DMAC
- **1:1**
    - Unique S-TAG or S-TAG+C-TAG per Client Service
    - Traffic switching based on S-TAG+C-TAG or S-TAG
- **Transparent LAN Services (TLS)**
    - The traffic is not processed
    - The CPU is not part of the EVC
    - Can be use 1:1 and N:1 topology

N:1 SERVICES

For these services:

- Forwarding is based on S-VID+DMAC (e.g. Residential Gateway MAC Address).
- Default GEM Port Transports Unicast Unknown, Multicast and Broadcast MAC Addresses
- Multicast Services only have the Default GEM

Figure 4. N:1 Services

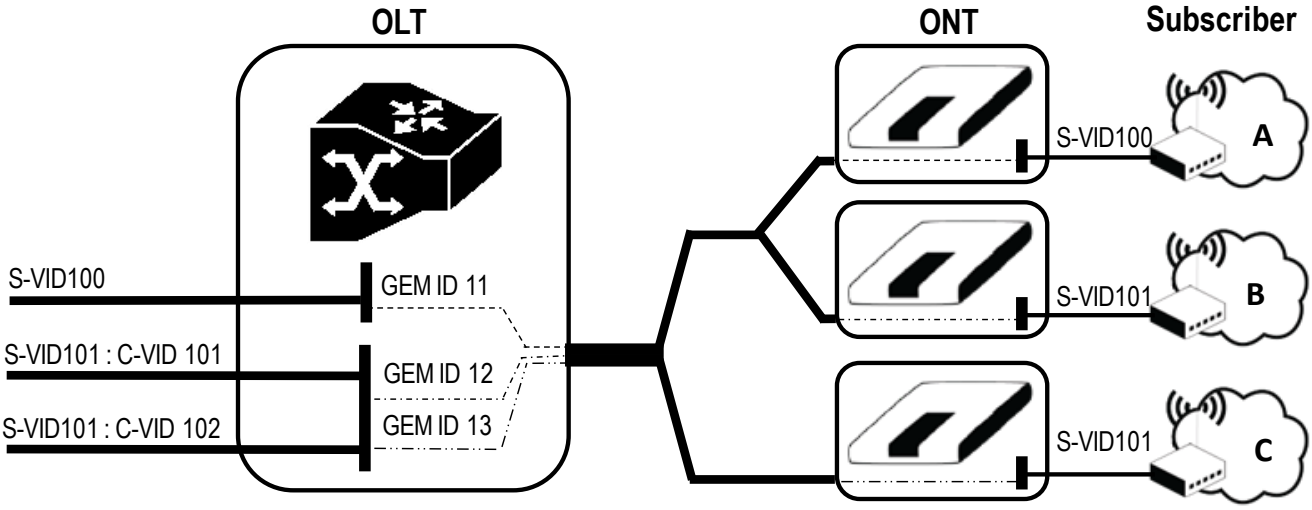


1:1 SERVICES

For these services:

- Traffic is encapsulated in different GEM ports according to S-VID and C-VID;
- Traffic is forward using S-Tags + C-Tags or S-Tags.

Figure 5. 1:1 Services



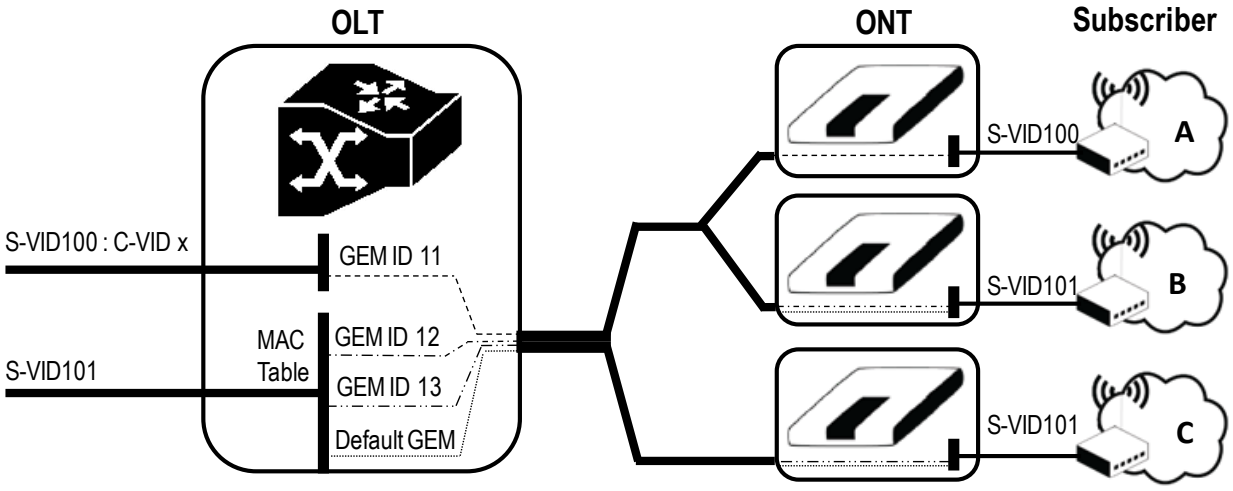
TRANSPARENT LAN SERVICES (TLS)

For this type of services:

- The traffic is not processed

- The CPU is not part of the EVC
- Can be use 1:1 and N:1 topology

Figure 6: TLS Services



ACTIVE ETHERNET SERVICES SCENARIOS

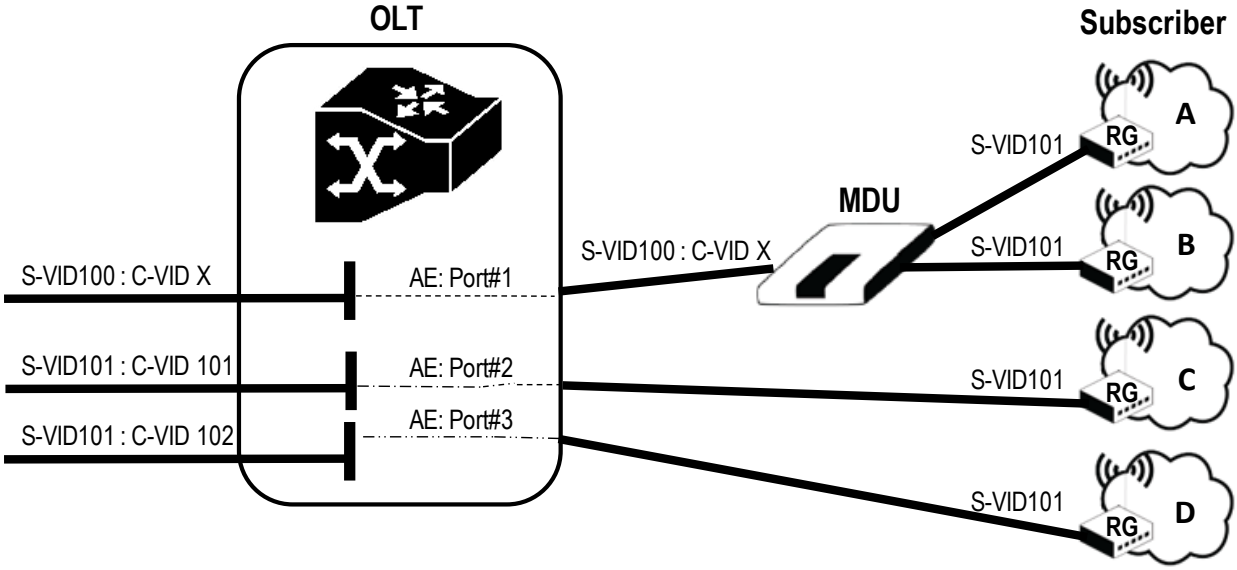
The OLT system supports the following Ethernet services over Active Ethernet:

1:1 SERVICES

For these services:

- Traffic is encapsulated in different GEM ports according to S-VID and C-VID;
- Traffic is forward using S-Tags + C-Tags or S-Tags.

Figure 7. AE 1:1 Services

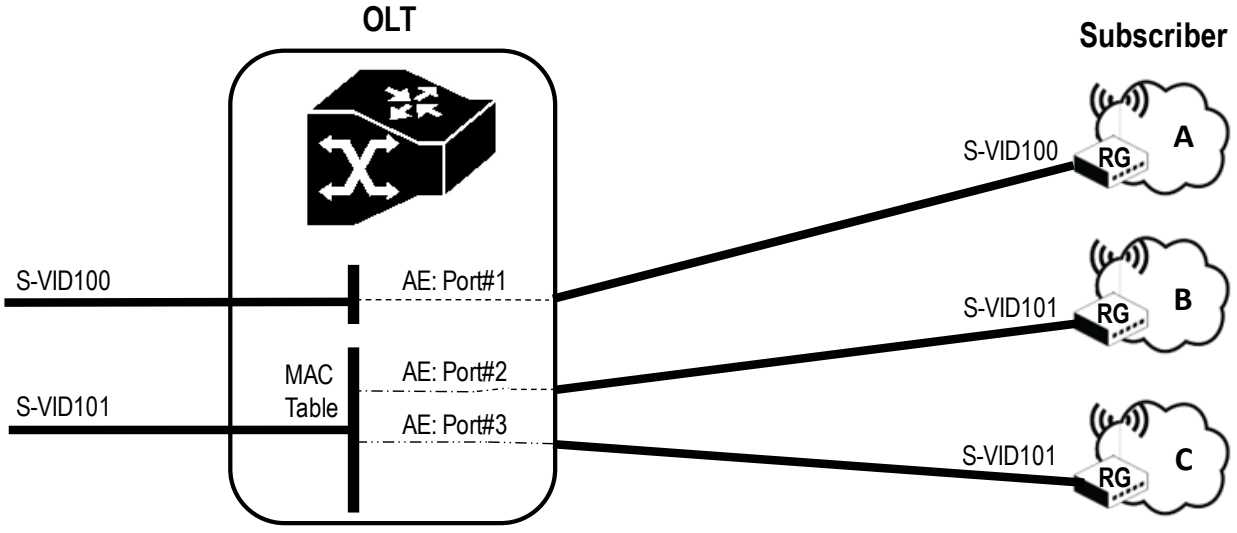


N:1 SERVICES

For these services:

- Forwarding is based on S-VID+DMAC (e.g. Residential Gateway MAC Address).

Figure 8. AE N:1 Services



OLT SYSTEM FEATURES

The OLT system provides the following Ethernet features distributed by the Switching and Client boards:

- VLAN Switching;
- Multicast – IGMP Snooping/Proxy;
- Load Balancing and LACP;
- DHCP Relay Agent;
- QoS.

In the client boards it is performed the interworking between the Ethernet and GPON packets. They are also responsible for managing the ONT via OMCI. The main features are:

- Downstream/Upstream bit rate: 2.488/1.244 Gbps;
- Advanced Encryption Standard (AES);
- Forward Error Correction (FEC);
- Up to 64 ONT per PON;
- L2 Manipulation: Transparent, Add/change S-Tag e C-Tag;
- Dynamic Bandwidth Allocation (DBA).

In parallel with the data services, the OLT System allows the transport of analog video services (RF Overlay).

The OLT System is a flexible system that can be adapted to deliver the full pack of broadband services including Ethernet for business/premium customers.

SERVICES

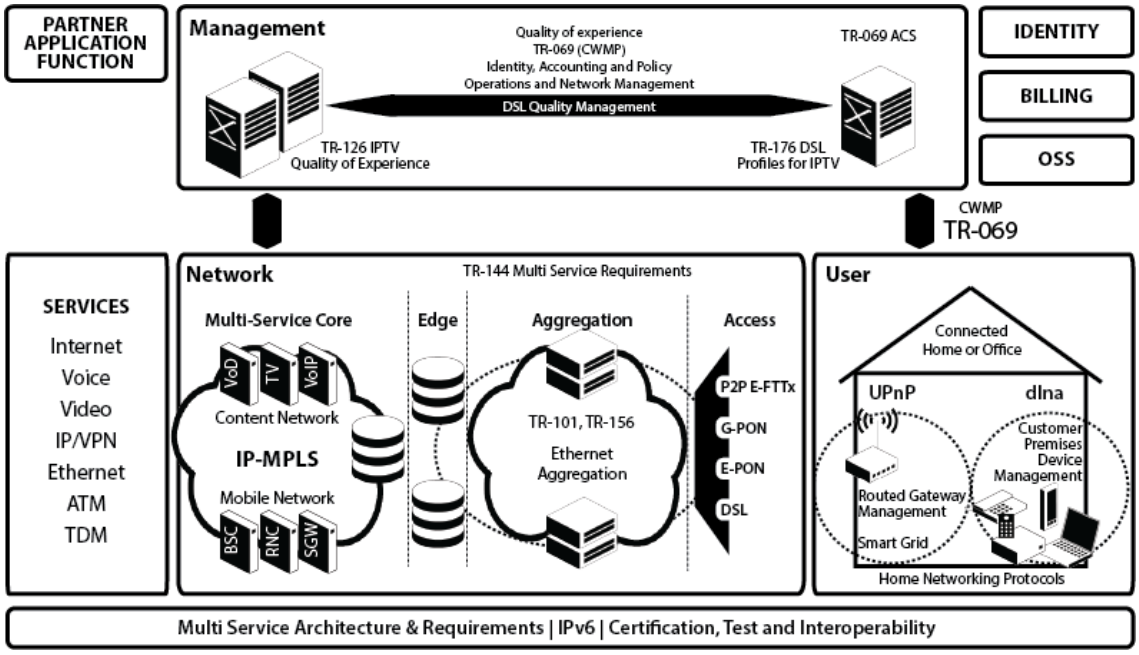
The following services' related features are supported by the OLT:

- Up to 255 network services
- Ingress bandwidth policers per client service on the AE48GE
- IPTV models for AE48GE board (ethernet point-to-point)
- MAC Bridge Service with user isolation
- Existing client services in ethernet point-to-point line cards

INTEROPERABILITY

The OLT system assures layer 2 and layer 3 interoperability with the transport segment of the network, according to Rec BBF TR-156, Figure 9.

Figure 9. Multiservice architecture &requirement, interoperability according to BBF TR-156



PLOAM

The PLOAM channel is message based and is carried in a dedicated space of the downstream XGTC frame and upstream XGTC burst. This channel is used for all PMD and XGTC management information that is not sent via the embedded OAM channel.

The OLT systems comply with ITU-T G.987.3 (10/2010) – 10-Gigabit-capable Passive Optical Networks physical media dependent layer specification.

This Recommendation describes the transmission convergence layer for 10-Gigabit-capable passive optical network systems.

OMCI

The OLT systems comply with ITU-T G.988 (10/2012) - ONU management and control interface (OMCI) specification.

G.988 recommendation specifies the managed entities of a protocol-independent management information base (MIB) that models the exchange of information between an optical line termination (OLT) and an optical network unit (ONU).

Configuration of OMCI channel encryption is supported.

ONU RELATED OLT OS SUPPORTED FEATURES

The following ONU related software features are supported by the OLT OS:

- Changing the upstream profile of a given ONU without disconnecting the respective service

- A command "Disable Serial Number" per ONU
- ONU Authentication by Password
- A command to reset all ONUs
- A command to disable the ONU Auto-Discovery mechanism
- Allow disabling a PON interface with registered ONUs
- ONU UPS alarms
- ONU VEIP interfaces
- Changing the ONU profile of a registered ONU
- A notification when an ONU is detected as a "New equipment
- Interoperability with Zhone and Huawei ONUs
- ONU MIB synchronization
- Provide the ONU ID related to the learned MAC Address in Switch MAC table
- Display the ONU Equipment Model (in 'new' state)
- Display the T-CONT IDs for each ONU service
- Command to do ONU MIB (re)synchronization
- Improvement of the ONU SW automatic upgrade policies
- Refactoring of ONU Ethernet statistics - split TX and RX
- Get the ONT Operational Status by SNMP

OMCI AND ONU SOFTWARE UPGRADE

The OLT supports ONUs' automatic software upgrade via OMCI according to standard G.984.4/G.988.

Following the control plane start software download order the downloading process is managed autonomously by the GPON MAC.

In order to inquire on the state of the operation queries are GPON MAC control plane enabled.

FEC (UPSTREAM/DOWNSTREAM) CONFIGURATION AND MONITORING

FEC function applied to traffic GPON upstream/downstream can be set for a specified ONU at the time the ONU registration. When set this function is configured on a given ONU FEC statistics are available for the ONU upstream/downstream traffic indicating:

- Number of bytes corrected with FEC
- Number of words corrected with FEC
- Number of words with unrecoverable errors
- Total number of words processed

ETHERNET

Ethernet architectures provide a dedicated Ethernet interface, connected via a dedicated fiber, to the premium/business customer. The complete fiber capacity is available for a single customer. The supported interfaces can be FE or GbE depending on the application and the customer needs. Long distance ranges can be achieved without the use intermediate repeaters, the maximum length of the fiber cable depend on the optic components used both in the central office and at the CPE.

The OLT equipment, besides supporting a GPON access network, also provides Ethernet access network interfaces which will meet advanced premium/business client requirements. Within each one of the Ethernet OLT ports following features are provided:

VLAN PROVISIONING

The following VLAN related software features are supported:

- Full support of extended VLAN tagging operations (filter+treatment)
- Support Default VLAN ID and Priority on Ethernet interfaces

The Range of VLAN ID per port – VLANs are configured individually; the limits are the following:

- Switch Fabric where uplink ports are directly connected:
  - Just membership: up to 4k VLAN ID per port,
  - VLAN translation: up to 8k VLAN ID shared over existing LCs.
- GPON Line Card(LC):,:
  - Just membership: up to 4k VLAN ID per port,
  - VLAN translation: up to 8k VLAN ID shared over 16 GPON ports LC.
- Point to Point Line Card:
  - Just membership: up to 4k VLAN ID per port,
  - VLAN translation: up to 512k VLAN ID shared over 48 GbE/FE ports LC

MULTICAST

SUPPORTED FEATURES

- Support of IGMP v2
- Support of IGMP v3 according to RFC3376
- Multicast group features
  - Support configuring the end-point of the multicast static groups
  - Support bandwidth configuration of each multicast group
  - Display Client Service information in Multicast Active Groups list
- IGMP features:
  - Improvement of IGMP control per interface, VLAN and client
  - Support IGMP control based on multicast bandwidth and number of groups

- Allow disabling IGMP packet processing on client services
- Support IGMPv3 on the scenario of merged UNI multicast VLANs

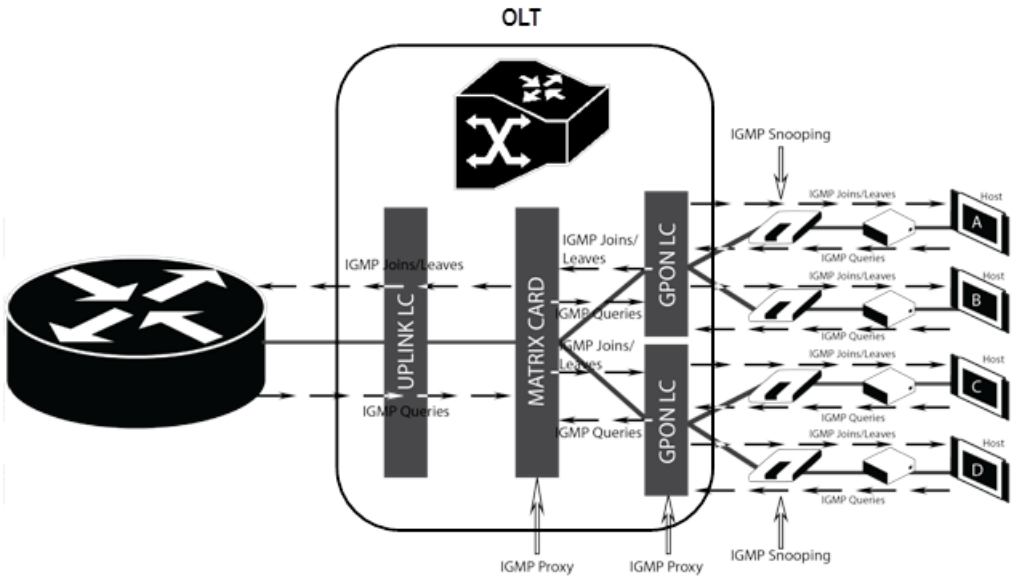
IGMP SNOOPING/PROXY

The OLT system provides IP Multicast features by implementing an IGMP Proxy mechanism. For each Multicast Service it is defined the VLAN of the client side and the VLAN that transports the IP Multicast Groups, so that all the IGMP packets with these VLANs are intercepted and delivered to the processor to perform the following actions:

- The first Join for a certain Group received from the client side will be translated to a Join on the Network side, using the OLT Source MAC and Source IP;
- The last Leave for a certain group received from the client side will be translated to a Leave on the Network side, using OLT Source MAC and Source IP;
- The OLT transmits periodical IGMP General Queries to the client side using the Multicast VLAN;
- The OLT answers to IGMP General Queries received from the Network with all Multicast Groups active in the system (requested by the clients and statically configured).

The OLT supports Static Multicast Groups, so that these groups are always present in the GPON interfaces even if no client demanded that Multicast group. The OLT answers to the upstream Queries as these Groups are always in the OLT.

Figure 10. IGMP Packets Processing/Forwarding Diagram



The Multicast IPTV traffic is controlled via the IGMP Protocol. In the several parts that make the GPON Access Network there are several modules performing their tasks in order to reduce traffic replication and bandwidth waste through the network. So each of the components perform the following tasks:

- The Host generates the Joins/Leaves according to the streams it wants to receive and plays the IP Multicast Streams;
- The ONT makes IGMP Snooping in order to transport from the Multicast GEM Port to the host, only the streams it wants to receive;

- The GPON Line card acts like an IGMP Proxy, receiving the requests from the hosts, and checking if it is already receiving or not the IP Multicast Streams from the network, sending to the Switch Fabric card the first Join message to ask for the stream and the last Leave message to stop receiving the stream from the upstream. It also answers to the IGMP Queries generated by the Switch Fabric card. It inserts the Multicast Streams in the Multicast GEM Port of the GPON interface where there are clients pretending to receive those Streams; In order to check if the hosts are still watching the channels and they didn't disconnect without advising (send a leave) General Queries are periodical generated towards the hosts;
- The Switch Fabric card acts like an IGMP Proxy, receiving the requests from the line cards, and checking if it is already receiving or not the IP Multicast Streams from the network, sending to the Uplink Ports the first Join message to request that stream and the last Leave message to stop receiving the stream. It also answers to the IGMP Queries received on the Uplink Ports. In order to check if the line cards are still watching the channels and they didn't disconnect without advising (send a leave) General Queries are periodical generated towards the line cards.

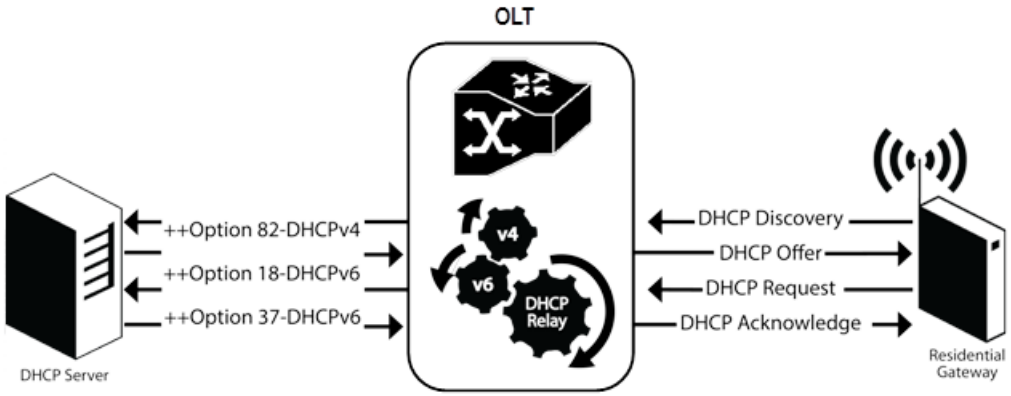
AUTHENTICATION: DHCP RELAY

The OLT can act like a DHCP Relay Agent for DHCPv4 (RFC 3046) & v6 (RFC 6221) inserting client information (circuit id and remote id) in the DHCP packets. This information is required by authentication platform to assign IP addresses to the clients.

Circuit-id is an automatic string generated by the OLT; the user can choose the syntax he pretends to use.

Remote-id is a string which is user configured at the time the service is provisioned to the customer.

Figure 11. OLT as a DHCP relay agent



OLT supported DHCP related software features:

- Support the configuration of UNI interfaces as DHCP Trusted or Untrusted
- Support changing the DHCP Broadcast flag of DHCP Discover and Request messages

DHCP RELAY AGENT OPTION 82

The OLT system provides DHCP Relay Agent feature by inserting/removing (inserting in the client→network direction and removing in the network→client direction) of Option 82 in the DHCP packets. The Option 82 has the role to introduce client specific information in the requests made to the DHCP servers. This information is added in two fields, Circuit ID and Remote ID.

The Circuit ID sub-option transports specific information of the circuit in question. In the case of the OLT system it identifies which is the ONT in question by adding a string with the following format:

System_name eth board/pon/ont/ont_board/ont_port

The Remote ID sub-option transports client specific information, as for example, the service plan hired by the customer. This field is composed by a string with 64 characters.

LIGHTWEIGHT DHCPv6 RELAY AGENT

Lightweight DHCPv6 Relay Agent is used to insert relay agent options in DHCPv6 message exchanges identifying client interfaces. The messages received from the client interfaces of the following types will be discarded:

- Advertise
- Reply
- Reconfigure
- Relay-Reply

The other message types will be encapsulated in a Relay-Forward message towards the DHCP server. The Relay Forward Message will be composed by the Relay-Message Option (9) which will encapsulate the client request, and optionally by the Interface-ID (18) Option and/or the Remote-ID Option (37) which will add client information.

The DHCPv6 Relay Agent only accepts the following type of message from the server:

- Relay-Reply

After receiving the Relay-Reply message from the server, the DHCPv6 Relay Agent extracts the information in the Relay-Message Option (9) and forwards it to the corresponding client. At this point the Relay Agent Binding table is updated with the corresponding IPv6/MAC Address/Client/Lease information.

SECURITY

The OLT equipment enables a group of features that avoid anti-DOS (Denial of Service) attacks and fake customer Trojan mechanisms, namely:

- ACL's
- White list support
- IP Source Guard
- MAC duplication
- MAC/IP spoofing
- Broadcast rate control
- User isolation

ACL - ACCESS CONTROL LISTS SUPPORT

ACL's (Access Control Lists) avoid the customers to use certain MAC or IP addresses in order to avoid them to reach certain networks MAC/IP groups. This feature is made by applying filters to source and/or destination MAC/IP addresses. These filters can be used to allow or drop the packets from a user attendance.

WHITE LIST FOR MULTICAST GROUP ADDRESSES

The OLT supports a default entry on the Multicast Groups addresses ACL (white list).

This list is used to select the upstream multicast service (VLAN) when a particular client requests a group address.

The maximum number of groups is currently limited to 1024, but can go up to 4096 in the future;

IP SOURCE GUARD

IP Source Guard provides source IP address filtering on a Layer 2 port to prevent a malicious host from impersonating a legitimate host by assuming the legitimate host's IP address. The feature uses dynamic DHCP snooping and static IP source binding to match IP addresses to hosts on untrusted Layer 2 access ports

MAC DUPLICATION

MAC duplication is used to check and control if a specific customer is trying to use other MAC addresses different from its addressed one. This is a mechanism that detects duplicate MAC addresses. In order to avoid a copy of the BRAS, IPTV platform or other server MAC address, the system gives priority to the MAC address learnt in the uplink ports (network side). If the duplicate MAC addresses are both in the client side, the system forwards the traffic to the first customer that is using that MAC address.

MAC/IP SPOOFING

MAC/IP spoofing is used to allow only the authorized customers to access the network. This mechanism uses the DHCP Binding Table. The table with the client MAC address/IP address is built during the DHCP client IP attribution. The packet attributes from the client will only pass through the network in the case they have the same SMAC/SIP like those at the Binding Table.

STORM ATTACK RATE LIMITERS

The OLT allows the configuration of "Storm Attack" rate limiters in order to prevent malicious users that try to stress the network and the CPU of the network elements causing DoS on the system.

There are three types of configurable rate limiters:

- Broadcast
- Multicast
- Unicast Unknown

Rate limiters parameter Maximum rate in bps (bits per second) is configurable between 0 and 1Mbps. Default configured value is of 1M bps

These limiters are applied to all services except:*

- In-band traffic
- Bitstream services
- Multicast services (CPU trap active but MC flood is off)

USER ISOLATION

User isolation is achieved by the topology of the EVC's created in the system. The services are created in an EVP-TREE topology, the Root port is the uplink port and the Leaf ports are the client ports. Within this implementation, users can't communicate between themselves and just flow transparently through the Access Node.

QOS

The OLT system provides several QoS mechanisms, that can be targeted to the flow characterized by one or two VLAN according with the type of service, or can be targeted to the packets priority, where each p-bit/DSCP is mapped in one of eight queues of each port.

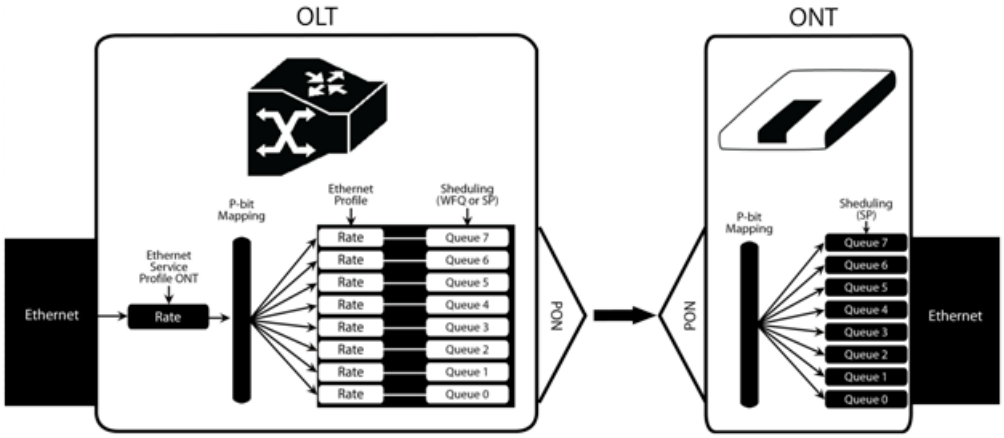
The following QoS features are supported on each one of the Ethernet OLT ports:

- Classification : DSCP to P-bit mapping
- Queuing,
- Scheduling
- Rate Limiting (Ethernet Profiles' configurable parameters: CIR, CBS, EIR, EBS)
- Forward PON traffic based on P-bits

For each of the OLT ports there are associated eight queues; for each of these queues is possible to configure the p-bit/DSCP mapping in one of the queues, the scheduler type (Strict Priority or Weighted Fair Queuing) and the minimum and maximum bandwidth of each queue.

In the downstream direction the ingress traffic first passes by a policer configured to each ONT service, which is defined by one or two tags. After this the traffic is put in a queue according with the p-bit//DSCP->queue mapping. Each of these queues is associated with a scheduler and a policer. Then the traffic flows to the GPON interface and when it arrives to the ONT it will pass by a mapping block which will map the traffic in one of the eight queues according with the p-bits, these queues have a Strict Priority scheduler in order to guarantee that the most prioritized traffic passes first.

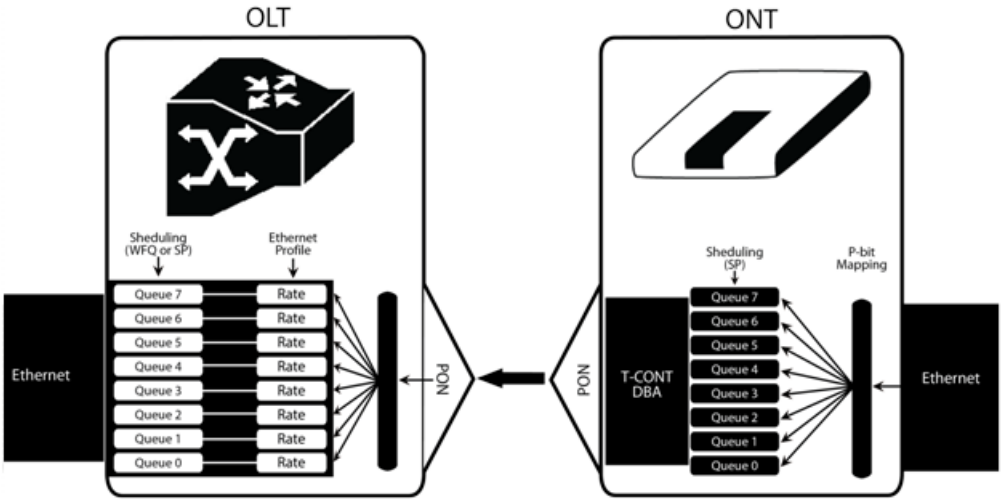
Figure 12.Downstream QoS Diagram



In the upstream direction, for each T-CONT the ingress traffic in the ONT passes by a mapping block that maps the traffic in one of the eight queues according with the p-bit, (in case the ingress traffic is untagged a DSCP->p-bit mapping is performed), these queues have a Strict Priority Scheduler. The ONT "waits" until the OLT assigns a transmission timeslot for that T-CONT, so that the most prioritized queues are the ones that transmit first. In the OLT

ingress, the traffic is put into a queue according with what is defined in the p-bit/DSCP->queue mapping. Each of these queues has an associated scheduler and policer that control the traffic sent to the uplink.

Figure 13. Upstream QoS Diagram



MTU

The OLT supports MTU configuration:

- GPON interfaces: up to 2036 bytes
- GE or 10GE interfaces: up to 9600 bytes

OAM

The OLT supports Y.1731 ETH-CC / ETH-RDI Function (CCM).

ETHERNET COUNTERS (RFC2819)

The OLT supports Ethernet statistics (RFC2819) on all point-to-point interfaces.

MAC

The OLT supports the following MAC related features:

- Switch MAC table
- Allow limiting the number of MAC addresses per service
- Display the total number of entries in MAC address tables
- MAC Addresses,
    - Number of learnt MAC Addresses: Up to 128K MAC addresses.
    - Learning rate per second: HW based poses no rate limitation

DYNAMIC BANDWIDTH ALLOCATION (DBA)

The DBA (Dynamic Bandwidth Allocation) is available in order to optimize the upstream bandwidth. This mechanism consists in defining an adequate T-CONT to the service traffic in question. There are five types of T-CONT, defined by the Fixed, Assured and Maximum Parameters:

- Type 1: Only fixed Bandwidth;
- Type 2: Only Assured Bandwidth;
- Type 3: Assured+Maximum Bandwidth;
- Type 4: Only Maximum Bandwidth (Best Effort);
- Type 5: Fixed+Assured+Maximum Bandwidth.

Table 2. T-CONT type definition

T-CONT	Type 1	Type 2	Type 3	Type 4	Type 5	Units
Fixed BW- ***RF***	***RF1***	0	0	0	***RF5***	[b/s]
Assured BW- ***RA***	0	***RA2***	***RA3***	0	***RA5***	[b/s]
Max Bw - ***RM***	***RM1 = RF1***	***RM2 = RA2***	***RM3 > RA3***	***RM4***	***RM5 > RF5 + RA5***	[b/s]
Bandwidth Eligibility	0	0	Non-Assured BW - ***RNA***	Best-Effort - ***RBE***	***RNA / RBE***	

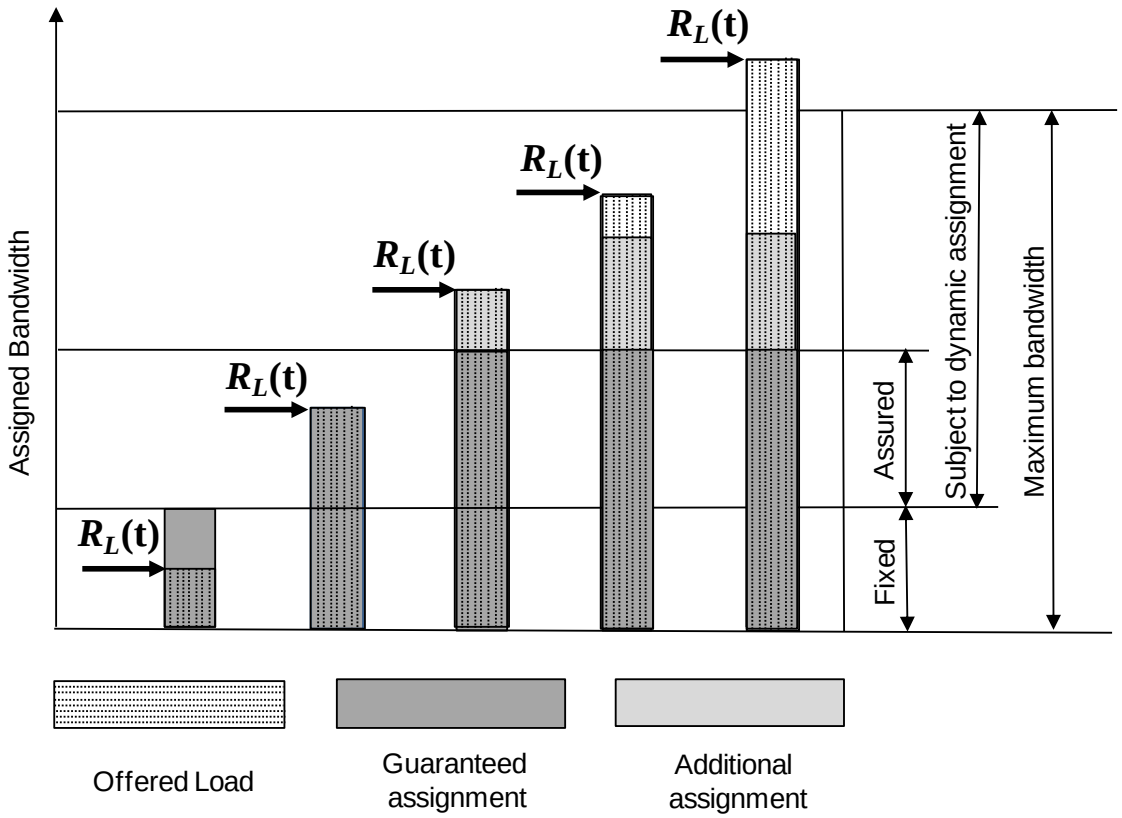
In each GPON interface there is 1024 Alloc-ID (T-CONT identifiers) available, provided to manage ONT services. They are distributed in the following way:

Table 3. Alloc-ID's distribution by T-CONT type

Alloc-ID	Allocation Type
0-127	Default Alloc-ID (Dynamic or Static)

128-255	Reserved
256-639	Dynamic or Static
640-1023	Static

Figure 14. Traffic distribution by service/client



MAC GPON DBA ALGORITHM

The MAC GPON DBA algorithm can use two different algorithms:

- **Status Reporting:**

  Based on the information that each ONU sends to the GPON MAC frames upstream. This information allows the GPON MAC to know the use of queues of each of the ONUs and adjusting the bandwidth allocated to each application in terms of this

- **Traffic Monitoring:**

Based on occupancy of bandwidth of each UN in recent broadcasts.

It is possible to configure the type of algorithm to use in allocating bandwidth for CBR non-profiles as Status Reporting or Traffic Monitoring at the time of the creation of service corresponding traffic. The change of the type of DBA services already provisioned is in principle possible, except for the hardware limitation.

OVERBOOKING

The OLT system allows the overbooking of the GPON ports allowing the allocation of more than the overall aggregated port bandwidth in the downstream (2,5Gb/s) and upstream (1,25Gb/s). The Downstream (DS) allocation is done by configuring the Bandwidth Profiles – BWP that are responsible for assuring that the high priority packets (p.bit) are send to the OLT port in case of congestion. In the Upstream (US) the subscription is assured via Dynamic Bandwidth Allocation (DBA) applied to the ONTs centrally controlled by the OLT.

PON

SPLITTING RATIO OPTIONS

OLT system GPON ports currently support a splitting ratio of 1:64 in accordance with ITU-T rec. G.984.

SUPPORTED PON CLASSES

The OLT system currently supports B+ and C+ PON interfaces.

PROTECTION

HARDWARE PROTECTION AND SYSTEM AVAILABILITY

Common element redundancy and software protection is implemented at the OLT system by means of 1:1 hot-standby features. Automatic switching to redundant units is assured without service cutoff. The OLT system internal architecture (start architecture topology) guarantees that the failure of any unit does not impact the overall system. All single card units are hot swappable and switching protection features are performed without service disruption.

OLT system 1:1 common element redundancy is of:

- Processing and Switch Fabric unit
- Power feed Inputs

OLT SUPPORTED PROTECTION MECHANISMS

The following protection mechanisms are supported by the OLT system:

- GPON type-B protection
- Uplink 1:1 protection
- LACP

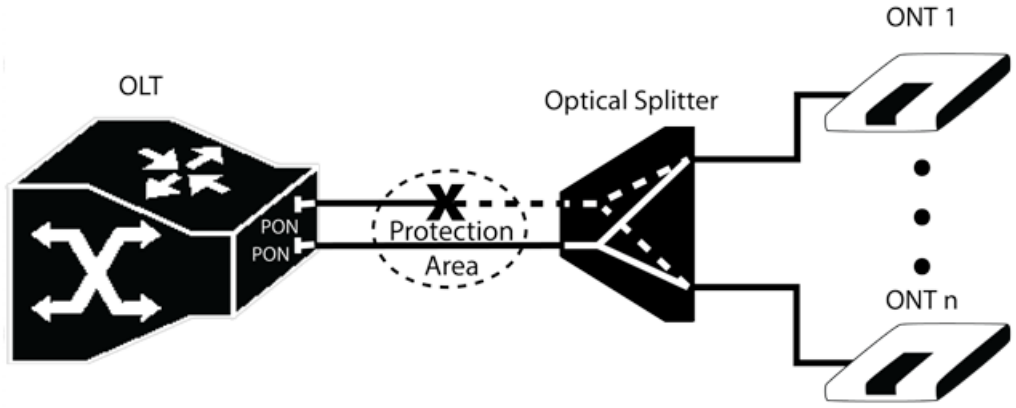
- ERPS

TYPE B REDUNDANCY FOR GPON PORTS

Configuration of type B redundancy for GPON ports (according to G.984), is a functionality that enables the protection of a GPON port with another GPON port on a different tributary unit.

This feature is hardware enabled on the OLT system. It allows1+1 GPON Line card protection for at least 4k ONTs (margin for splitter N:2 & 20km).

Figure 15. Type B redundancy for GPON ports



ETHERNET UPLINK PORTS PROTECTION

Configuration of Ethernet Uplink ports protection is a functionality that enables the 1+1 protection of an uplink port with another uplink port on a different uplink card unit.

LINK AGGREGATION CONTROL PROTOCOL (LACP)

The Link Aggregation Control Protocol (LACP) provides the system with Aggregation, Protection and Load Balancing features.

The Aggregation consists in a Logical Group of Physical 10GbE Ports that form a Link Aggregation Group (LAG).

Up to 8x 10GbE uplink Ports can be aggregated in the same LAG with the protection mechanisms flexibly configured by the management system.

The Protection is done when one of the LAG ports becomes inactive (Link Down) or there are losses or errors in LACPDU Messages (only in Dynamic LAG). In this case all the traffic that was going through this port is sent to the other ports that belong to the same LAG.

The Load Balancing can be made according with:

- Source MAC;
- Destination MAC;
- Source and Destination MAC.

ETHERNET RING PROTECTION SWITCHING

The OLT allows the implementation of ring protection according to ITU-T G.8032/Y.1344 Ethernet Ring Protection Switching.

- Support of "open ring" mode, i.e., access ring is configured as G.8032 sub-ring without R-APS Virtual Channel;
- Support of ETH-CC / ETH-RDI Function (CCM), Connectivity Fault Management (CFM) monitoring per VLAN, according to ITU-T Y.1731 / IEEE 802.1ag;
- Support of R-APS Channel.

PRINCIPLE OF OPERATION

The basic idea is to dedicate a link as Ring protection Link (RPL) that is normally blocked, but will be unblocked when a failure occurs in the ring.

This ensures that there is connectivity among all nodes on the ring without having a loop.

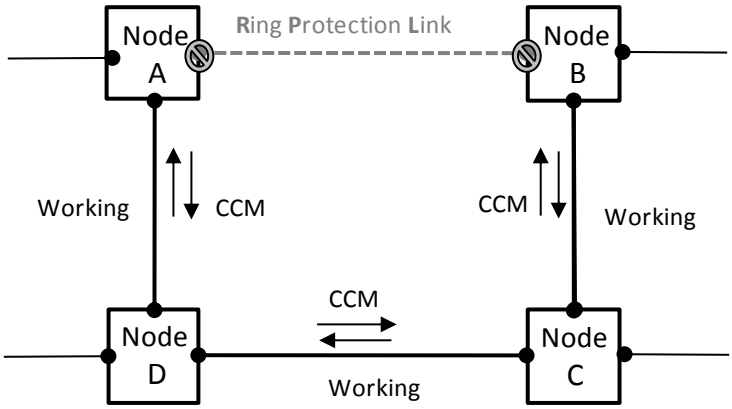
Connectivity Fault Management Messages (CCM) are used to detect link and node failure and

Ring Automatic Protection Switching Messages are used to coordinate the activity on the RPL.

MAC learning is enabled on all nodes and ports except on ports facing the RPL.

In normal operation RPL is blocked.

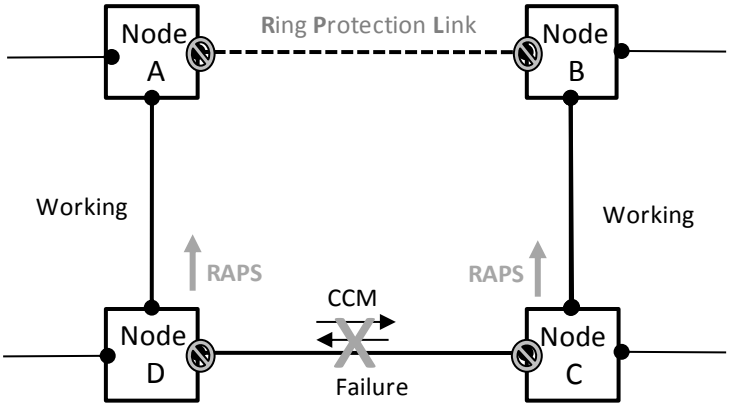
Figure 16. Normal ring operation



Any failure along the ring causes a CCM fault at the failure link adjacent nodes (nodes D and C in the example). These nodes after having blocked the ports facing the failure link, generate multicast an RAPS message via CPU on the dedicated VLAN, which is received by all other nodes on the ring, including nodes adjacent to RPL, in this case nodes A and B.

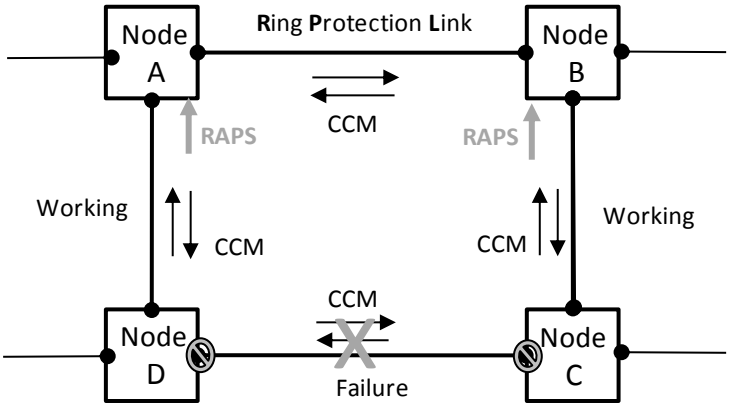
Nodes receiving the RAPS message send a copy to the Ethernet Ring Protection (ERP) entity and also forward the received RAPS to the next node

Figure 17. Link failure



Upon receiving the RPAS signal failure message Node A and B adjacent to RPL unblocks the RPL ports and traffic flows through the RPL.

Figure 18. Ring Protection Link operation



ERP TIMERS

WTR timer

- May be configured by the operator in 1 minute steps between 1 and 12 minutes, the default value being 5 minutes.

WTB timer

- Is defined to be 5 seconds longer than the guard timer.

Guard Timer

- The period of the guard timer may be configured by the operator in 10 ms steps between 10 ms and 2 seconds, with a default value of 500 ms.

Hold off timer

- The suggested range of the hold off timer is 0 to 10 seconds in steps of 100 ms with an accuracy of ±5 ms. the default value for hold off timer is 0 seconds.

SOFTWARE PROTECTION

Central processing OS software features and equipment resident databases are both available at the working and at the protection processing and Switch Fabric units. Both working and processing units are synchronized to the same software version.

SYNCHRONIZATION

The OLT equipment implements SyncE and IEEE 1588v2/PTP synchronization schemes. Timing over Packet (ToP) enables transfer of timing over an asynchronous network. The SyncE feature requires that each network element along the synchronization path need to support SyncE.

HYBRID SYNCHRONIZATION WITH THE OLT EQUIPMENT FAMILY

Within the OLT equipment, SyncE may co-exist with 1588 (PTP) in a hybrid configuration mode. The hybrid mode uses the clock derived from 1588 (PTP) to drive the system clock.

ETHERNET SYNCHRONIZATION MESSAGING CHANNEL (ESMC)

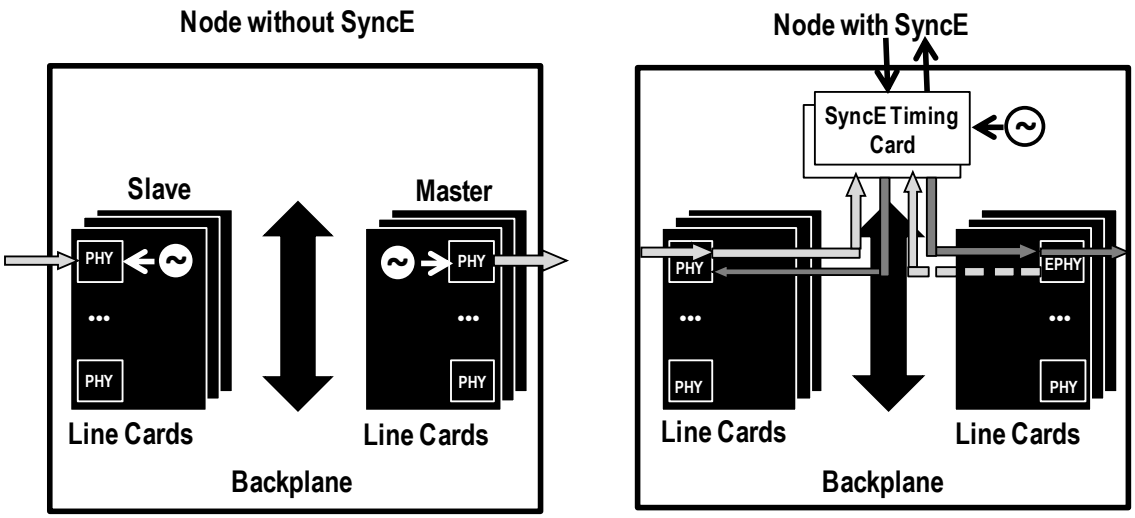
In order to maintain a logical communication channel in synchronous network connections, Ethernet relies on a channel called Ethernet Synchronization Messaging Channel (ESMC) based on IEEE 802.3 Organization Specific Slow Protocol standards. ESMC relays the SSM code that represents the quality level of the Ethernet Equipment Clock (EEC) in a physical layer.

To enable communications between various nodes, the OLT equipment (SyncE mode) provides an Ethernet Synchronization Status Messaging (ESMC, G.8264) channel, similar to SDH Synchronization Status Messaging (SSM) bytes that allow nodes to deliver their Synchronization Status to downstream nodes. The downstream nodes use this information to select between various references or possibly switch to their internal clock in case of failure on reference clocks.

SYNCHRONOUS ETHERNET (SyncE)

SyncE is defined by the ITU-T standards G.8261, G.8262, G.8264, and G.781. Frequency distribution protocol based Ethernet physical layer of Ethernet. The purpose of SyncE is to distribute frequency information through an Ethernet device. In this context “frequency” and “bit-rate” effectively have the same meaning, since SyncE attempts to determine frequency information from incoming bit streams. The basic operation of SyncE interfaces is deriving the frequency from the received bit stream and passing that information up to the system clock.

Figure 19. With and without SyncE



ETHERNET WITHOUT SyncE (e.g. 1000Base-T)

Systems without SyncE have the following characteristics:

- Rx clock extracted from line (line timed)
- Tx clock generated from free-running XO
    - Clock within 100 ppm (125 MHz+/- 0.01 percent)
- No relationship between Rx and Tx
- Each Ethernet interface (uni-dir or bi-dir) has own independent timing

ETHERNET WITH SyncE (e.g. 1000Base-T)

Systems with SyncE have the following characteristics:

- Rx clock extracted from line & transferred to timing engine
- Tx clock generated from the timing card
    - Clock within 4.6 ppm when free-running
- Tx clock uses traceable to PRC/PRS
- Note SyncE clock input may replace XO or may be in addition to normal XO input

IEEE 1588v2

IEEE1588v2 (also known as Precision Time Protocol, PTP) is a two-way precision protocol independent of the physical layer with time and frequency distribution protocol based on time-stamp information exchange to synchronize clocks over packet--based Ethernet networks. It synchronizes the local slave clock on each network device with a system Grandmaster clock and uses traffic time--stamping, with sub--nanoseconds granularity, to deliver the very high accuracies of synchronization needed to ensure the stability of base station frequency and handovers. Timestamps

between master and slave devices are sent within specific PTP packets and in its basic form the protocol is administration--free.

The ITU-T defined profile of the IEEE 1588-2008 specification has been specifically optimized to support telecommunications applications such as wireless Mobile Backhaul, GPON and LTE.

The OLT Equipment supports IEEE 1588v2 as the following standard type devices:

- Ordinary Clock (Can be a Master or Slave clock)
- Boundary Clock (Acts as a Master and a Slave clock)
- Transparent clock

Following elements are defined:

Grandmaster

- An ordinary clock is a 1588 clock with a single PTP port that can operate in one of the following modes:
    - PTP Master: Distributes timing information over the network to one or more slave clocks, thus allowing the slave to synchronize its clock to the master.
    - PTP Slave: Recovers the frequency and phase clock, from the timestamps sent by the Master.

Boundary Clock

- The Boundary clock functions as both PTP master and slave. It acts as the slave to a Grand Master and derives the reference from the Grand Master. Boundary clock starts its own PTP session with a number of downstream slaves. The boundary clock mitigates the number of network hops and results in packet delay variations in the packet network between the Grand Master and Slave.

Transparent clock

- A transparent clock is a device or a switch that calculates the time it requires to forward traffic and updates the PTP time correction field to account for the delay, making the device transparent in terms of time calculations.

CLIENT/SERVER MODEL

- Master clock, slave clock (ordinary clock)
- Intermediary nodes may or may not support IEEE1588 PTP (unlike SyncE)
- On-path support mechanisms:
    - Boundary clock
        - It acts as a slave clock at port that connects to the grandmaster, and as a master to all other ports
        - It isolates the “downstream” clocks from any delays and jitter within the switch/routers
    - Transparent clock

- It measures residence time of PTP events

SYNC-E AND IEEE 1588v2/PTP AT THE OLT EQUIPMENT

Network clocking is supported on the following cards:

- GPON Line Cards
  - AMX-16GPON,
- 10GbE Uplink Line Card
  - UMX-4x10GE,

CLOCK CONFIGURATIONS SUPPORTED BY THE OLT

Different configurations are supported:

- Clock Recovery: System clock is recovered from the clocking source (GbE, 10Gbe and 100Gbe).
- Clock Recovery from External Interface: System clock is recovered from clocking source or a GPS interface.
- Line to External: The clock received from an interface is forwarded to an external Synchronization Supply Unit (SSU).

The following sync. parameters are configurable in the OLT

- Quality level Mode – Active or inactive
- Reversibility level Mode– Active or inactive
- Reversibility time – 0 to 3600 s
- Holdover Message delay switching Message delay – 500 to 2000 ms
- Switching Message delay – 180 to 500 s
- Minimum Quality Before Squelch – Inactive, PRC G.811, SSU-A, SSU-B,SEC or DNU
- Send value after Quality Unknown - PRC G.811, SSU-A, SSU-B,SEC or DNU
- Number of external sync.- 2 IN and 2 OUT

BASIC OPERATION OF 1588V2

SOFTWARE TIME-STAMP VS HARDWARE TIME-STAMP

There are two techniques to time-stamp packets:

1. Software time-stamp occurs when the messages are handled by the software. Usually occurring in the message's receive/ transmit interrupt service routine (ISR), the time-stamp is the current value of the system time.

2. Hardware time-stamp occurs when the messages physically arrive at or leave the device. The time-stamp operation is executed by hardware, which maintains its own continuous time information.

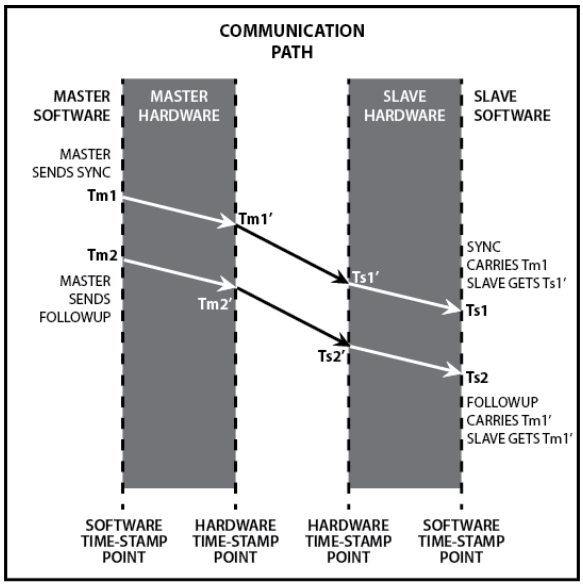
Either time-stamp method is acceptable in IEEE 1588, but a hardware time-stamp can provide significantly better precision.

The OLT equipment provides HW time stamp.

DELAY FROM MASTER-CLOCK DEVICE TO SLAVE-CLOCK DEVICE

- At time Tm1, the master-clock device software reads the current local system time (Tm1, the software timestamp), inserts it into a Sync message, and sends the message out. The message leaves the master-clock device at a later time, Tm1', which is the hardware time-stamp. It arrives at slave-clock hardware at Ts1' (slave-clock device local time), and is received by the slave-clock device software at a later time, Ts1. The software will read the hardware time-stamp to get Ts1'. If there is no communication delay, Ts1' should be equal to (Tm1' + Tms), where Tms is the time difference between master clock and slave clock. The protocol's ultimate goal is to compensate for this difference.
- After the Sync message has been sent, the master-clock device software reads the Sync message's departure time, Tm1', through the time-stamping unit, inserts it into a Follow-up message, and sends that message out at Tm2. This message is received by slave clock device software at Ts2. At this point, the slave-clock device software has the two times, Ts1' (Sync arrival time) and Tm1‘ (Sync departure time). The master-to-slave path delay, Tmsd, is determined by Equation Tmsd=(Ts1´+Tms)-Tm1´

Figure 20. Delay from Master-Clock Device to Slave-Clock Device

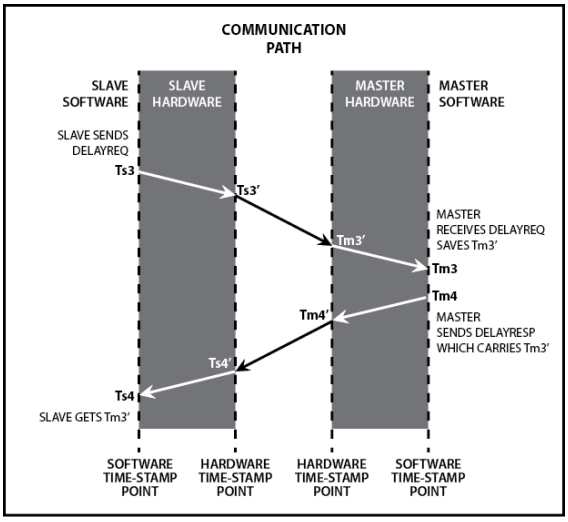


DELAY FROM SLAVE CLOCK DEVICE TO MASTER CLOCK DEVICE

- The DelayReq message is sent by the slave-clock devices, and the DelayResp message is sent by the master-clock device in response. With these messages, the slave-clock devices can calculate the communication path delay from the slave-clock device to the master-clock device.

- At time Ts3 (Figure 3), the slave-clock device software reads the current local system time (Ts3), inserts it into a DelayReq message, and sends the message out. After the message is sent, the slave-clock device software reads the time-stamp to get the departure time of the message, Ts3', and waits for the response from the master-clock device.
- The DelayReq message arrives at the master-clock device at a later time, Tm3', and is processed by the master software at Tm3. The software then reads the time-stamp to get the arrival time, Tm3', puts it into the DelayResp message, and sends to a slave-clock device at Tm4. When the slave-clock device software receives the DelayResp message at Ts4, it can extract the time, Tm3', and calculate the slave-to-master delay, Tsmd, by Equation Tsmd=Tm3´-(Ts3´+Tms).

Figure 21. Delay from Slave-Clock Device to Master-Clock Device



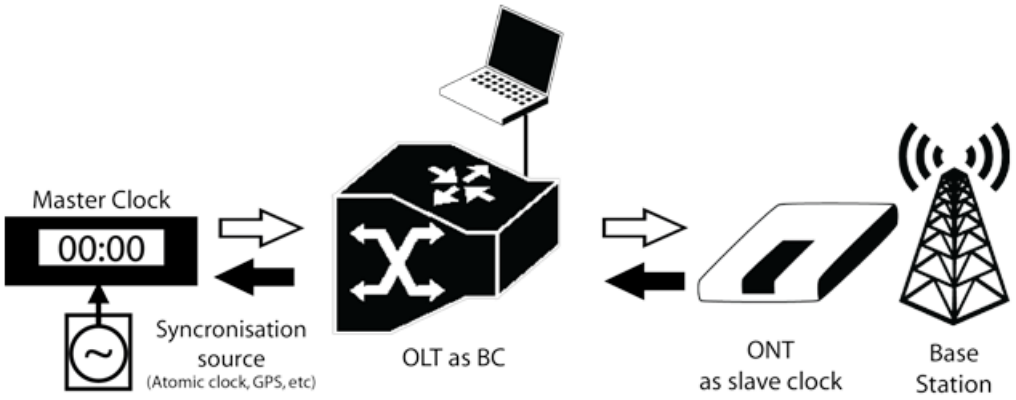
OLT EQUIPMENT CONFIGURED AS BOUND BOUNDARYCLOCK (BC)

The OLT configured as BC recover the clock and regenerate the PTP packets. Receives timing through the UMX-4x10GE unit.

The OLT is effectively a node that recovers timing from the incoming 1588v2 (as a Slave) and then uses this recovered timing to re-time the outgoing signal. It then acts as the 1588v2 Master for the next node. By using this mechanism, the impact of PDV is minimized as the packets will not travel through many routers or switches between Master and Slave (which would have caused PDV).

The OLT configured as Boundary clock can be considered as performing both the slave and master function. The 1588v2 message flow is terminated and the frequency and/or time recovered from the ingress messages. This is used to guide its internal reference. The boundary clock then acts as the master to the downstream clock by generating a new 1588v2 message flow using timestamps generated from its internal reference. The downstream flow to the ONT through the GPON LC (AMX-16GPON) unit.

Figure 22. Boundary Clock Synchronization mechanism (Mobile Backhaul Example)



MEASUREMENTS & LIMITS

The measurement limits for Frequency Accuracy (MTIE/TDEV) are specified by the relevant ITU-T standards that specify clock accuracy, for example G.813, G.823, G.824. G.8261, or "Timing and Synchronization Aspects in Packet Networks", specifies the upper limits of allowable network jitter and wander, the minimum requirements that network equipment at the TDM interfaces at the boundary of these packet networks can tolerate, and the minimum requirements for the synchronization function of network equipment. G.8263 "Timing characteristics of packet-based equipment clocks" specifies the outlines requirements for timing devices used in synchronizing network equipment that operates in the interworking function (IWF) and other network elements as defined in Recommendation ITU-T G.8261/Y.1361.

Frequency Accuracy (Wander), based on:

- TIE - time interval error
- MTIE - maximum time interval error
- MRTIE - maximum relative time interval error
- TDEV – time deviation
- Packet Delay Variation (PDV)

SUPPORT MULTIPLE TRAP DESTINATION SERVERS

The OLT supports the forwarding of traps to multiple simultaneous servers (up to 3), including:

- Trap v2
- INFORM
- Trap/ACK - SNMPV1 traps with ACK. The acknowledge is made by writing at the alarm table's alarmAkn (.1.3.6.1.4.1.4746.10.6.1.1.1.10)

The Trap/ACK type is specific for use with PTIN's Management System. Only one IP may have set the type 'TRAP-ACK' (limited implementation).

Trap v2 and Inform are standard.

The UDP port can be configured to send traps, default 162 (standard).

EXTERNAL ALARM CONDITIONS

Four external input alarm conditions are supported on the ME4620OLT througth each Switch Fabric card.

MANAGERS' CONFIGURATION

It is possible to configure the IPs of managers, and set the reading and configuration permissions for each of them.

It is also possible to configure static IP routes for the management interfaces

CONNECTIVITY FAULT MANAGEMENT (CFM)

Connectivity Fault Management (CFM) complies with Y.1731/IEEE 801.2ag standards.

This functionality is used in the AMX-48GE and UMX-4x10GE boards Ethernet interfaces CFM probing configuration.

REBOOT FEATURES

The following reboot options are supported by the OLT system:

- Support the option to perform a system reboot
- Support the option to reboot individual Line Cards and Switch Fabric Cards.

IP FEATURES

- IP Routing supported (Demo features)
- IPv6 ready on all OLT product line
- Ping/telnet command supported on CLI

STANDARDS AND PROTOCOLS

Table 4. Standards and Protocols

Type	Standards
PON layer	• ITU-T Recommendation G.984.x (GPON) • ITU-T Recommendation G.988 (OMCI) • BBF.247 – GPON certification program OLT interoperability • BBF TR.156i3 – Using GPON in the context of TR.101 • Advanced Encryption Standard (AES) • Forward Error Correction (FEC) • Up to 128 ONT or ONUs per PON • T-CONTs: 896 per PON • GEM port-IDs: 4096 per PON • Logical range: 60 km • Maximum differential distance: 20 km
L2 layer	• Services: 1:1, N:1, VBES/TLS • VLAN-ID conversion to GEM port-ID • VLAN promotion • VLAN translation • Ethernet Ring Protection Switching (ERPS G.8032) • IEEE 802.1Q VLAN tagging • IEEE 802.1P (VLAN QoS 4096 VLAN) • Per-port QoS and CoS mapping according to IEEE 802.1q and IEEE 802.1p • IEEE 802.1ad Provider Bridges • IEEE 802.1 ad Q-in-Q VLAN stacking • IEEE 802.3x Flow Control • IEEE 802.3ad Link Aggregation – LAG or LACP • IGMP v2 (RFC2236), IGMP V3 (RFC 3376) • RFC1350 TFTP protocol • RFC0959 FTP protocol • RFC1305 NTP protocol

	• SFF-8472 Specification for Diagnostic Monitoring Interface for XCVRs • RFC2131 DHCP • RFC3046 DHCP Relay Agent Info (Option 82) • RFC3315 Dynamic Host Configuration Protocol for IPv6 (DHCPv6) (Option 18 Interface Id) • RFC6221 Lightweight DHCPv6 Relay Agent • RFC4649 Dynamic Host Configuration Protocol for IPv6 (DHCPv6) Relay Agent Remote-ID Option 37 • ITU-T Y.1731 / IEEE 802.1ag
Timing and synchronism	• ITU-T Rec G.8261- Timing and synchronization aspects in packet Networks • Synchronous Ethernet (Sync-E) • ITU-T Rec. G.8262 - Timing characteristics of a synchronous Ethernet equipment slave clock • IEEE1588v2/PTP • ITU-T Rec. G.8263 Timing Characteristics of Packet based Equipment Clocks (PEC) • ITU-T Recommendation G.8265.1 Precision time protocol telecom profile for frequency synchronization
Management	• Local management by CLI and HTTP or HTTPS web browser • Remote management using Telnet or SSH and SNMPv1/v2/v3 • CPE remote management over OMCI and TR-69 • In-band and out-of-band management • Receive power monitoring per ONT • Per-user accounting and logging • Local alarm storage and Syslog • Automated backup, restore, and rollback
Redundancy	• GPON Type B redundancy • Active/standby GPON card and GPON port redundancy • Active-active, active/standby network Interfaces • Active-standby switching fabric redundancy • Hot-swappable modules
Electromagnetic	• FCC Part 15 Class
Emissions compliance	• EN 55022 Class A (CISPR22 Class A)

	• EN 55024 • EN 50082 • EN61000-3-2/3 • EN61000-4-2/3/4/5/6/8/11
Safety	• UL 60950-1 • CAN/CSA 22.2 No.60950-1 • EN 60950-1 • IEC 60950-1 • NOM-019-SCFI
NEBS	• GR-63-CORE, GR-1089-CORE - Level 3, Type 2 • GR-3108-CORE
ETSI	• EN 300 019 1-1- Storage: Class 1.2 – Not temperature controlled storage locations • EN 300 019 1-2 - Transportation: Class 2.3 – Public transportation • EN 300 019 1-3 - In-Use: Class 3.12 - Partly temp. controlled locations

Chapter 3
SYSTEM SPECIFICATIONS

This Chapter describes the OLT system specifications

OLT EQUIPMENT CHASSIS FEATURES

Table 5. OLT Equipment Chassis Features

Chassis Feature	OLT-SYSTEM
ETSI 19'' rack size	3U
Total number of slots	5
Number of usable slots for Switch Fabric cards	2
Number of usable slots for Uplink line cards	3(1)
Number of usable slots for GPON line cards	3(1)
Number of usable slots for Active Ethernet Line cards	3(1)

(1) Shared with the other line cards

OLT EQUIPMENT BOARDS FEATURES

Table 6. OLT Equipment Board Features

	Board features				
Board Type	**Type of ports**	**Nº of ports**	**Type of pluggable module**	**Capacity towards backplane (Gbit/s)**	**Switching Fabric capacity (Gbit/s)**
Switch Fabric	10GE	2	SFP+	160	160
GPON Line Card	GPON	16	SFP	40	-
Active Ethernet Line Card	GE/FE	48	CSFP	40	-

OPTICAL INTERFACES

10GE INTERFACES

These interfaces are deployed in the form of optical SFP+ transceivers which use LC/PC connectors and have the following characteristics:

Table 7. Optical 10Gbase interfaces characteristics

Optical 10Gbase	**Type**	10GBASE-LR/LW (10 km)	10GBASE-ER/EW (40 km)	10GBASE-ZR/ZW (80 km)
	Laser type emitter	SLM (DFB)	SLM (EA-DFB)	SLM(EA-DFB)
	Operation Range (nm)	1260 to 1355	1530 to 1565	1530 to 1565
	Wave length typ. (nm)	1310	1550	1550
	Spectral width Max. (nm)	NA	NA	NA
	Min SMSR (dB)	30	30	30
	Tolerated dispersion max. (ps/nm)	NA	NA	1600
	Emission Power Max/min (dBm)	0.5 / -8.2	4.0 / -4.7*	4.0 / -1.0
	Min Extinction Ratio (dB)	3.5	3.0	6.0
	Receiver Type	PIN	PIN	APD
	Attenuation Range (dB)	NA	NA	NA
	Sensibility (dBm) BER < 10^{-10}	-12.6	-14.1	-24
	Receiver Saturation (dBm)	-1	-1	-7
	Max. Penalization per optical course (dB)	1	3	3
	Protection against Cuts	Automatic Laser Shut Down		
	According to Recommendations	(IEEE 802.3, Clause 49, 50 and 52)	(IEEE 802.3, Clause 49, 50 and 52)	-

* Average launch power (min) is informative and not the principal indicator of signal strength. A transmitter with launch power below this value cannot be compliant; however, a value above this does not ensure compliance.

1GE ETHERNET INTERFACES

These interfaces are deployed in the form of optical CSFP transceivers which use LC/PC connectors and have the following characteristics:

Table 8. Optical 1000Base interfaces characteristics

Optical 1000Base	**Type**	1000BASE-BX10-D
	Laser type emitter	Longwave Laser
	Operation Range (nm) TX	1480 to 1500
	Operation Range (nm) RX	1260 to 1360
	Spectral width Max (nm)	0.88 to 2.09
	Minimum Side Mode Suppression Ratio (dB)	-
	Emission Power Max/min (dBm) to SMF	-3/-9
	Min Extinction Ratio (dB)	6
	Receiver Type	
	Attenuation Range (dB)	10.5
	Sensibility (dBm) **BER < 10^{-10}**	-19.5
	Receiver Saturation (dBm)	-3
	Maximum Penalization per optical course (dB)	5.5
	According to Recommendations	IEEE 802.3, clause 59.

GPON Interfaces

ITU-T Recommendations G.984.2 + G.984.2 Amd 1 + G.984.2 Amd 2.

Table 9. GPON Interfaces Specification

G-PON OLT Transceiver	**Items**	**Unit**	**B+**	**C+**
			OLT Tx	**OLT Tx**
	Nominal bit rate	Mbit/s	2488.32	2488.32
	Operating wavelength	nm	1480-1500	1480-1500
	Line code	--	Scrambled NRZ	Scrambled NRZ

	Minimum ORL	dB	>32	>32
	Mean launched power MIN	dBm	+1.5	+3
	Mean launched power MAX	dBm	+5	+7
	Extinction ratio	dB	>8.2	>8.2
	Tolerance to the transmitter incident light power	dB	>-15	>-15
	SLM Laser – MAX −20 dB width	nm	1	1
	SLM Laser – MIN SMSR	dB	30	30
			OLT Rx	**OLT Rx**
	Nominal bit rate	Mbit/s	1244	1244
	Upstream operating Wavelength	nm	1260-1360	1260-1360
	Maximum reflectance of equipment, measured at Rx wavelength	dB	<-20	<-20
	Bit Error Ratio (BER)	--	$<-10^{-10}$	-10^{-4**}
	Minimum sensitivity	dBm	-28	-32**
	Minimum overload	dBm	-8	-12**
	Downstream optical penalty	dB	0.5	1
	Consecutive identical digit immunity	bit	>72	>72
	Tolerance to reflected optical power	dB	<10	<10

**OLT RX= -12 ~-32 dBm (The OLT sensitivity assumes the use of the optional RS (255,239) FEC capability of the G-PON TC layer, as well as intrinsic detector technology improvements)

B+ LINK BUDGET

This budget covers all optical components between the extended OLT and ONU, including non-integrated WDM filters for the multiplex of video overlays and other enhancement band services, and must include any Raman impairment from the overlay signal.

Table 10. B+ Link Budget

	unit	Single Fiber
Minimum optical loss at 1490 nm	dB	13
Minimum optical loss at 1310 nm	dB	13
Maximum optical loss at 1490 nm	dB	28
Maximum optical loss at 1310 nm	dB	28

C+ LINK BUDGET

This budget covers all optical components between the extended OLT and ONU, including non-integrated WDM filters for the multiplex of video overlays and other enhancement band services, and must include any Raman impairment from the overlay signal.

Table 11. C+ Link Budget

	unit	Single Fiber
Minimum optical loss at 1490 nm	dB	17
Minimum optical loss at 1310 nm	dB	17
Maximum optical loss at 1490 nm	dB	32
Maximum optical loss at 1310 nm	dB	32
Maximum fiber length	km	60

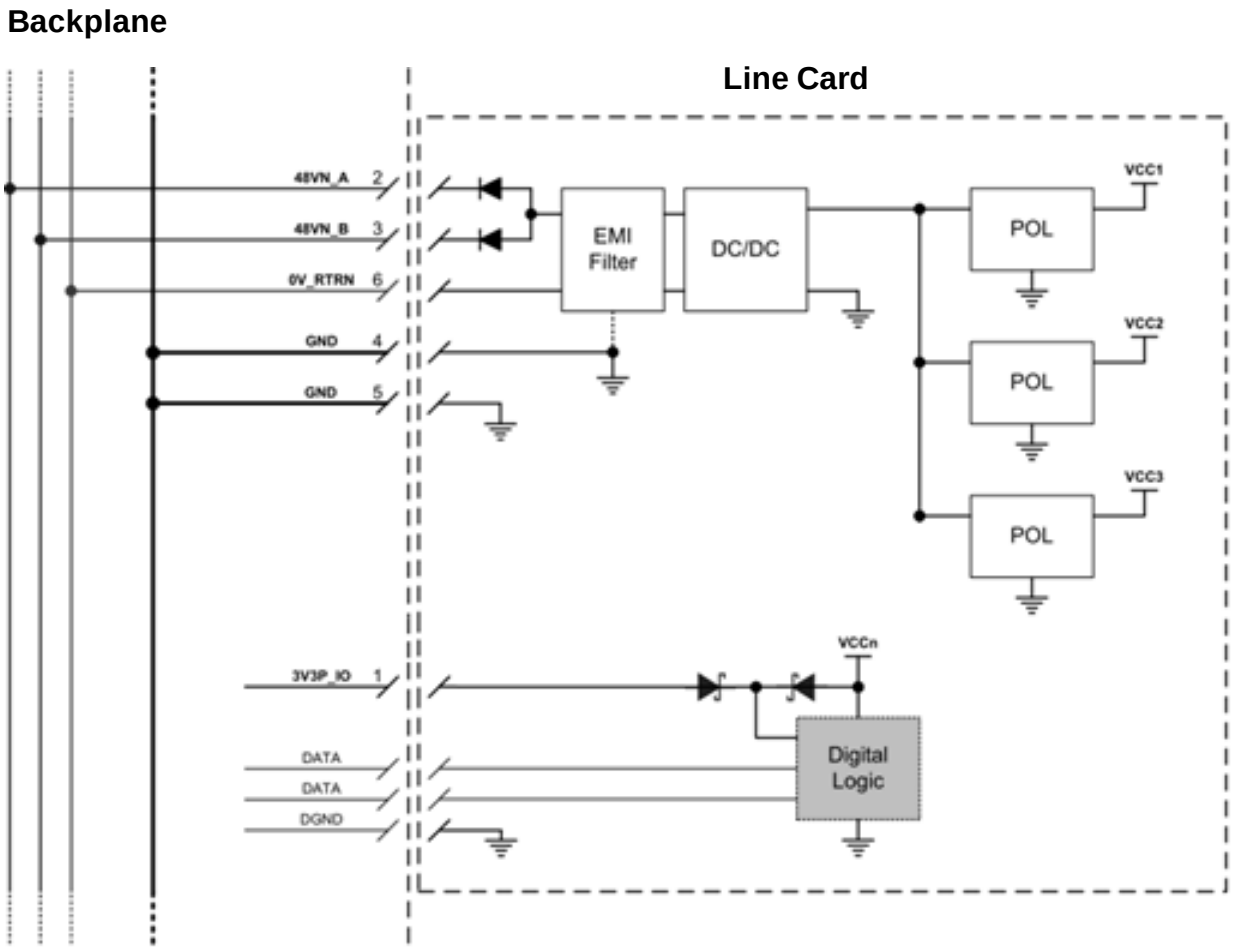
POWER SUPPLY

As mentioned above, the OLT system uses a -48VDC input voltage for its power supply. It works properly within -40.50VDC to -57VDC voltage range in compliance with the ETSI EN 300 132-2 V2.1.1 (2003-01) recommendation. The earth connections comply with the ETSI ETS 300 253: January 1995 recommendation

POWER CONNECTIONS

Card power connections and card power distribution diagram are provided bellow for the Line Cards, Figure 23.

Figure 23: Line Card power connection and distribution diagram



POWER CONSUMPTION

Please see below the unit parts Power consumption.

Table 12. Power Consumption

Type of Unit	Unit name	Power Consumption(W @ -48VDC)
Chassis	ME4605 OLT	< 18 (Fan Module)
Switch Fabric	XCO-160	< 66
GPON line cards	AMX-16GPON	< 85
Active Ethernet line cards	AMX-48GE	< 75

SYSTEM HEAT RELEASE

OLT system maximum heat release for a fully equipped chassis is of 405W.

WEIGHT & PHYSICAL DIMENSIONS

The physical dimensions of the OLT system are the following:

Figure 24. ME4605 OLT 3 D chassis schematic and dimensions (mm)

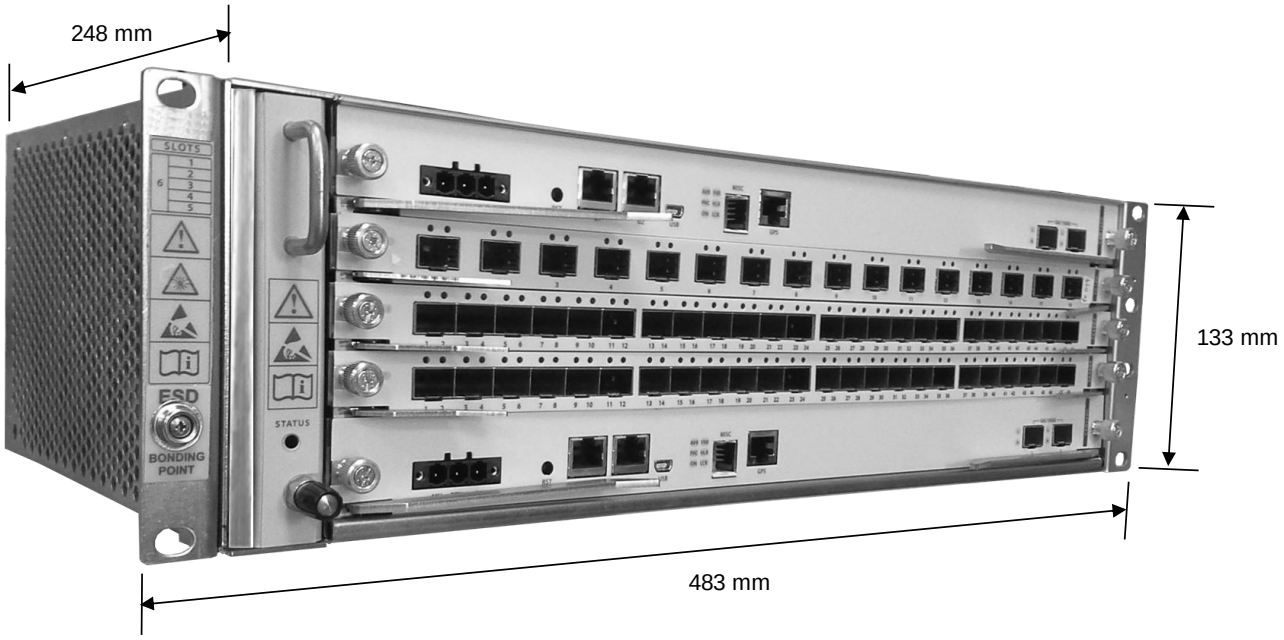


Table 13. Weight & Physical Dimensions

Dimension	Height (mm) / RU	Width (mm) / "	Depth (mm)	Weight (max Kg)
ME4605 OLT	133/3	483 / 19	248	12 (with cards)

The ME4605 OLT chassis can be mounted on an ETSI ETS 300 119-2 type rack, with a depth of 300mm.

Figure 25.ME4605 OLT chassis front and side view

MTBF

Please see below the unit parts MTBF (Mean Time Before Failure).

Table 14. Mean Time Between Failures

Type of Unit	Unit name	MTBF (hours)	Temperature (ºC)
Chassis	ME4605 OLT	1036014	40
Switch Fabric	XCO-160	133354	40
GPON line cards	AMX-16GPON	188133	40
Active Ethernet line cards	AMX-48GE	275233	40

ENVIRONMENTAL CONDITIONS

This system is carrier class designed and complies with Considered equivalent to ATIS-0600010.01.2008 Class 2, Harsh – Protected Environment.

This system will properly work within Class 2 environments for equipment placed inside a space protected from direct outside weather and environmental stresses by a closure and where the operating climate is between:

- -40°C (-40°F) and 65°C (149°F)
- 5 and 85 RH% Relative Humidity

"These locations usually have either (a) active means of cooling using fans and/or heat exchangers, or (b) design features (cooling fins or airflow pattern) within the closure or the equipment to effectively dissipate heat from active equipment.

Although these facilities do not have a preset specific temperature range as a target, their physical design features (e.g., cooling fins) and devices (e.g., fans, heat exchangers) greatly aid heat dissipation and help moderate the thermal environment surrounding the electronic equipment.

The temperature conditions above are the expected extremes provided for equipment design purposes. Normal operating temperature and humidity range experienced by the equipment in the closure is expected to be narrower. The operating temperature minimum of -40°C represents a scenario where a cold start is required after an emergency, such as a power outage caused by an ice storm or downed electrical power lines." (GR-3108-CORE).

ELECTROMAGNETIC COMPATIBILITY

This system is carrier class designed and suitable to work over extreme EM conditions. As such, it complies with the relevant recommendations for this type of installation, as listed in the ETSI EN 300 386 recommendation.

SYSTEM PARTS

The organization of the OLT system can be seen in the figure below, Figure 26 and Table 15, with the indication of the type of board and placement for one possible system setup.

Figure 26.OLT system Front View (3U chassis)

Table 15. OLT Equipment Module Features

Module	Name	Status
Chassis (including fan modules and power)	ME4605 OLT	Ready
Switch Fabric	XCO-160	Ready
GPON Line Card	AMX-16GPON	Ready
Active Ethernet Line Card	AMX-48GE	Ready

GPON LINE BOARD :: AMX-16GPON

The AMX-16GPON board provides sixteen Class B+ or C+ GPON interfaces. Each of the interfaces can have up to 64 clients in a maximum of 1024 clients per board.

Figure 27. GPON AMX-16GPON line board front view

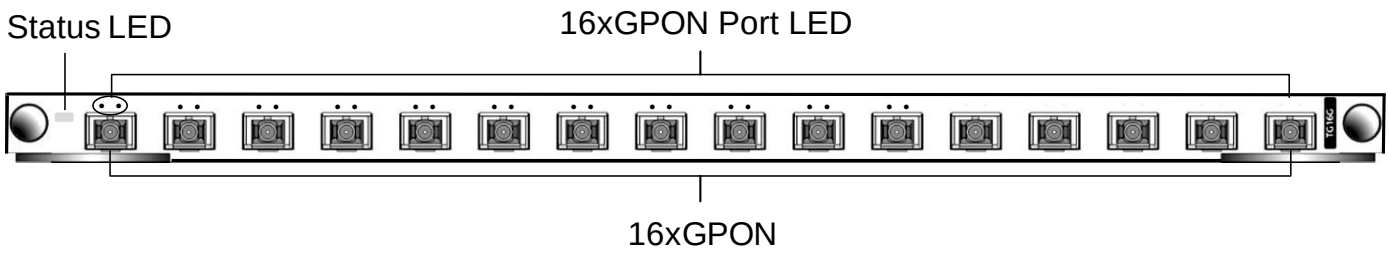


Table 16. GPON AMX-16GPON line boardSlot position in OLT shelf

Board	OLT system	Slot
AMX-16GPON	ME4605 OLT	2 to 4

INTERFACES

- GPON interfaces;
    - SFP Modules

LED INDICATORS

The board provides two LED for each of the 16 GPON ports, numbered from 1-16, that must indicate the GPON interfaces states:

- one status LED at the top/left-side of the board front panel with the following behavior:
    - RED: Board is starting or in failure.
    - GREEN(blinking): Board is fully operational and running.
- LED LINK (left hand side of the SFP):
    - OFF: GPON Port disabled
    - GREEN: GPON Port enabled and SFP plugged
    - RED: GPON Port enabled and SFP unplugged
- LED ACTIVITY (right hand side of the SFP):
    - GREEN: When the interface is active and in case it has registered ONT's, at least one of them is active;
    - RED(LOS): When all registered ONU/T are absent.

INTERFACE INTERCONNECTION CABLES

The connection to the GPON interfaces is done by SFP transceivers that are accessible through fiber optic patch cords with SC/PC connectors.

ACTIVE ETHERNET (EFM) LINE BOARD :: AMX-48GE

The Active Ethernet Line board AMX-48GE provides 48 bidirectional Active Ethernet ports. The system supports P2P or Uplink topology per port.

The board supports:

- SYNC-E and IEEE 1588v2/PTP
- Y.1731 OAM.

Figure 28. Active Ethernet AMX-48GE line board front view

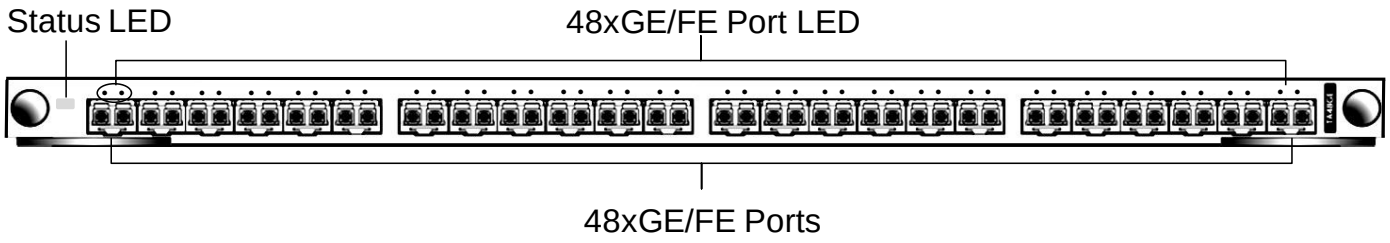


Table 17. Active Ethernet AMX-48GE line board Slot position in OLT shelf

Board	OLT system	Slot
AMX-48GE	ME4605 OLT	2 to 4

INTERFACES

- 48x GE/FE, Active Ethernet,(EFM);
    - Bidirectional CSFPs modules (1000BASE-BX)

LED INDICATORS

The board provides a LED for each of the 48 ports, numbered from 1-48, that must indicate that the GE/FE interface is:

- one status LED at the top/left-side of the board front panel with the following behavior:
    - RED: Board is starting or in failure.
    - GREEN(blinking): Board is fully operational and running.
- RED: when the interface is active but has no active link;
- GREEN:when the interface is active and has an active link;

- BLINKING GREEN: when the interface is active, has link and has data traffic

INTERFACE INTERCONNECTION CABLES

The connection to the 48x GE/FE interfaces is done by CSFP transceivers that are accessible through fiber optic patch cords with LC/PC connectors.

SWITCH FABRIC BOARDS::XCO-160

The Switch Fabric boards provide the Operation and Maintenance function of the system, and it also switches the client traffic between the client and uplink boards. The OLT system must be equipped with two Switch Fabric boards in order to guarantee 1+1 redundancy for switching and management.

XCO-160 is a Switch Fabric board for ME4605 OLT systems. XCO-160 has a 160 Gbps switching capacity.

This board has four 10GbE internal connections and one O&M for each of the uplink and client boards in the system.

Figure 29. XCO-160 Front panel

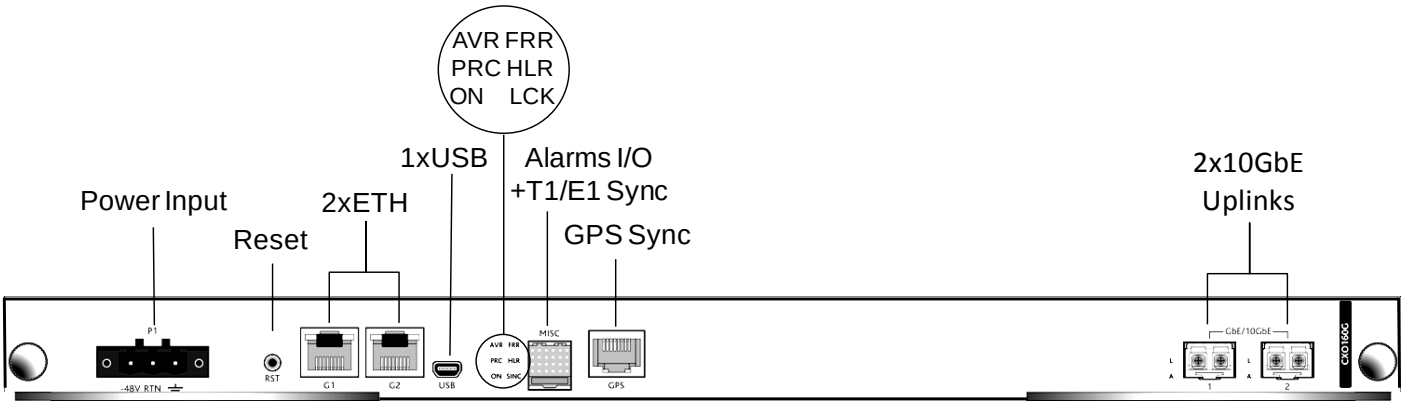


Table 18. XCO-160 Slot position in OLT shelf

Board	OLT system	Slot
XCO-160	ME4605 OLT	1 and 5

INTERFACES

- 2x ETH management interfaces G1 and G2 (RJ45);
- 1xUSB serial management interface
- MISC (Alarms/conditions and ACK indicators) contacts
- 1x GPS Synchonism interface

- 2 x 10GbE uplink interfaces
    - SFP+ modules

LED INDICATORS

The board provides 6 LEDs, named AVR, PRC, ON, FRR, HLR and LCK, that must indicate

- AVR: stands for the portuguese word «AVaRia» that means «Malfunction»
    - Steady GREEN - Board is operational;
    - Blinking GREEN 3 times per second - Board is in protection mode;
    - Steady RED - Internal hardware malfunction, please replace board;
    - Blinking RED 3 times per second - Invalid local database;
    - Blinking RED 5 times per second - Invalid hardware licence invalid;
- PRC: stands for the word «Processing» and defines the overall state of the board:
    - If Led is either OFF or steady GREEN the board has an internal hardware malfuction that does not allow the board to boot
    - If Led blinks GREEN 1 time per second the board is active;
    - If Led blinks GREEN 3 times per second the board is inactive;
- ON: reflects the state of the -48VDC power supplies (A and B):
    - Steady green if rail A and B are OK;
    - Blinking GREEN/RED if rail A is NOT OK and rail B is OK;
    - Double GREEN/RED blinking if rail A is OK and rail B is NOT OK;
- FRR: System clock is in a free run state. FRR stands for «Free Run»:
    - Steady Green if the PLL is not in Hold Over Mode, but sync is locked;
    - Steady Red if the PLL is in Hold Over Mode;

  (If FRR is green HLR must be Off and vice-versa)
- HLR: System clock is in Hold Over state. HLD stands for «Hold Over»:
    - Staedy Green if the PLL is in Hold Over Mode;
    - Off otherwise

  (If HLR is green, FRR must be Off and vice-versa)
- LCK: System clock lock state with a given reference clock. LCK stands for «LOCK»:
    - Steady GREEN if the PLL Locked;
    - Steady RED if the PLL is not Locked;

Note: If AVR is blinking GREEN 3 times per second (meaning Board is in protection mode) or blinking RED 3 times per second (meaning invalid local database) leds FRR, HLR and LCK will display the same behaviour as AVR led.

INTERFACE INTERCONNECTION CABLES

XCO boards have two Ethernet (G1 and G2) and one serial (USB) interfaces, for management purposes only. For the G1 and G2 interfaces, UTP network cable category 5e or higher with RJ45 connectors should be used as interconnection cable. The expected range with this interconnection cable is 100m maximum.

For the MISC interface a Metral 2mm (FCI TM) plug is used.

Chapter 4
SETUP

This chapter describes the OLT system installation procedures

MECHANICAL PACKAGING

Important!

When installing or servicing these GPON systems it is necessary to take into account the following aspects:

- In a servicing system it is imperative that the access to any board or fan module, can be done without affecting the service supported by other units;
- The grids that exist in the steel structures which are used for entry and exit of air, should not be clogged up with the penalty of affecting the correct functioning of the cooling system;
- Once the connections and access to equipment interfaces are made, a distance of approximately 12cm in front of the structure must be reserved, to accommodate the wiring.
- It is imperative to follow all ESD precautions described in ESD , when accessing to the OLT system or handling any system board or module.
- It is imperative to disconnect all power source on the Disconnect Device before servicing the unit.

ESD PRECAUTIONS

Important!

When performing OLT system service actions, observe the following electrostatic discharge (ESD) precautions:

- Wear an antistatic wrist strip at all times when handling any system part, board or module.
- Before handling any system part, board or module, discharge any static electricity by touching a grounded surface.
- Remove all plastic, vinyl, and foam material from the work area.
- Do not remove a system board or module from its antistatic protective bag until you are ready to install it.
- After removing a board or module from the system chassis, immediately place it in an antistatic bag or antistatic packaging.
- Handle any system board only by its edges and avoid touching the components or circuitry.
- Do not slide a system board or module over any surface.
- Limit body movement (which builds up static electricity) during the removal and replacement of a system board or module.

ME4605 OLT SYSTEM

The ME4605 OLT system occupies the height of a 3U/19" infrastructure, Figure 24. The chassis has a breach immediately above the tributary cards, in order to better accommodate and fix the cable and fibers that will connect to the system.

Figure 30. ME4605 OLT setup

ME4605 OLT Front View

RESTRITED ACCESS LOCATION

The ME4605 OLT unit to be installed in Restricted Access Location

The intended installation location of the product will be, Network Telecommunication Facilities, namely Central Offices (COs), and Outside Plant (OSP).

ELECTRICAL POWER SUPPLY

The electrical connection for the OLT equipment is of redundant -48VDC.

DISCONNECT DEVICE

A Disconnect Device must be installed close to unit chassis in order to allow disconnection of all power supply before servicing the unit.

In the case of installation in an ETSI rack, rack installed Power Box, Figure 30, provides disconnect device funcionality

Disconnect device circuit breaker should be rated 16 A max.

INSTALLATION IN EITHER CBN OR AN IBN

The ME4605 product is intended to be installed as part of a either a Common Bonding Network (CBN) or an Isolated Bonding Network (IBN).

DC RETURN CONDUCTOR TREATMENT

The ME4605-OLT is to be powered using an isolated DC return (DC-I configuration). The DC return conductor is not to be connected to the equipment frame or chassis ground

Bonding and grounding conductors shall be made of copper (tinned or untinned). Aluminum conductors shall not be used. Conductors made of wire, bus bar, or braided strap are acceptable. Conductors can be either insulated or uninsulated. Multiple connectors shall not be secured by the same bolt assemblies. Only listed two-hole compression-type connectors shall be used in making connections to flat surfaces (such as bus bars, frames, racks, or cabinets).

MULTIPLE POWER SOURCE

Power supply to the unit is provided by two 48 VN(egative) power supply source connection, source A and source B. Both connection, source A and source B must be supplied.

Important!

All unit power supply must be disconnected at the disconnect device before servicing the unit.

POWER SUPPLY CONNECTION PROCEDURES

Important!

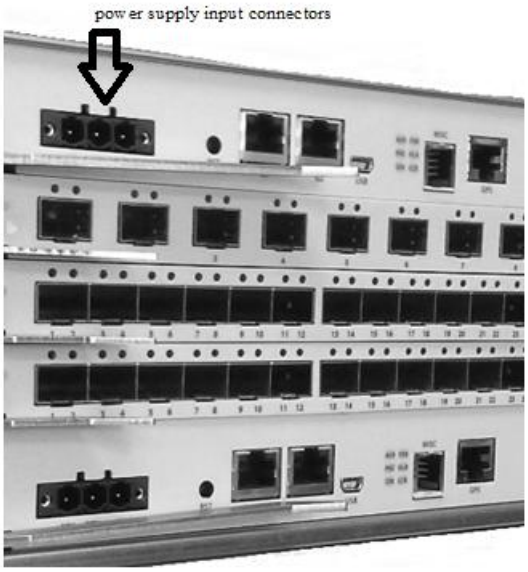
When performing OLT system service actions, observe electrostatic discharge (ESD) precautions, ESD

All unit power supply must be disconnected at the disconnect device before servicing the unit.

POWER SUPPLY CABLES CONNECTION

In the right side of the of the XCO-160 switch fabric front panel there a power input plug, (see Figure 31):

Figure 31. OLT power supply input connectors



Step 1 Use the H03VV-F conducting electrical cables with a trident power connector provided in the OLT mounting kit, Figure 38, to connect the two redundant power supplies.

CARD INSERTION AND REMOVAL

The ME4605 OLT cards are equipped with card handles in top and bottom of the card front panel to facilitate the insertion and removal of the cards in the chassis.

Important!

When performing OLT system service actions, observe electrostatic discharge (ESD) precautions, ESD

All cards are hot swappable.

Switch Fabric cards have predefined slots 1 and 5, (please see Table 18)

Line cards and uplink cards may use slots 2 to 4 (please see, Table 16 and Table 17)

CARD INSERTION HANDLING PROCEDURES

Step 1 Identify the slot where the card must be inserted.

Step 2 Loosen the two captive screws in the front of the slot covering blank panel.

Step 3 Remove the blank panel.

Step 4 Unpack the card.

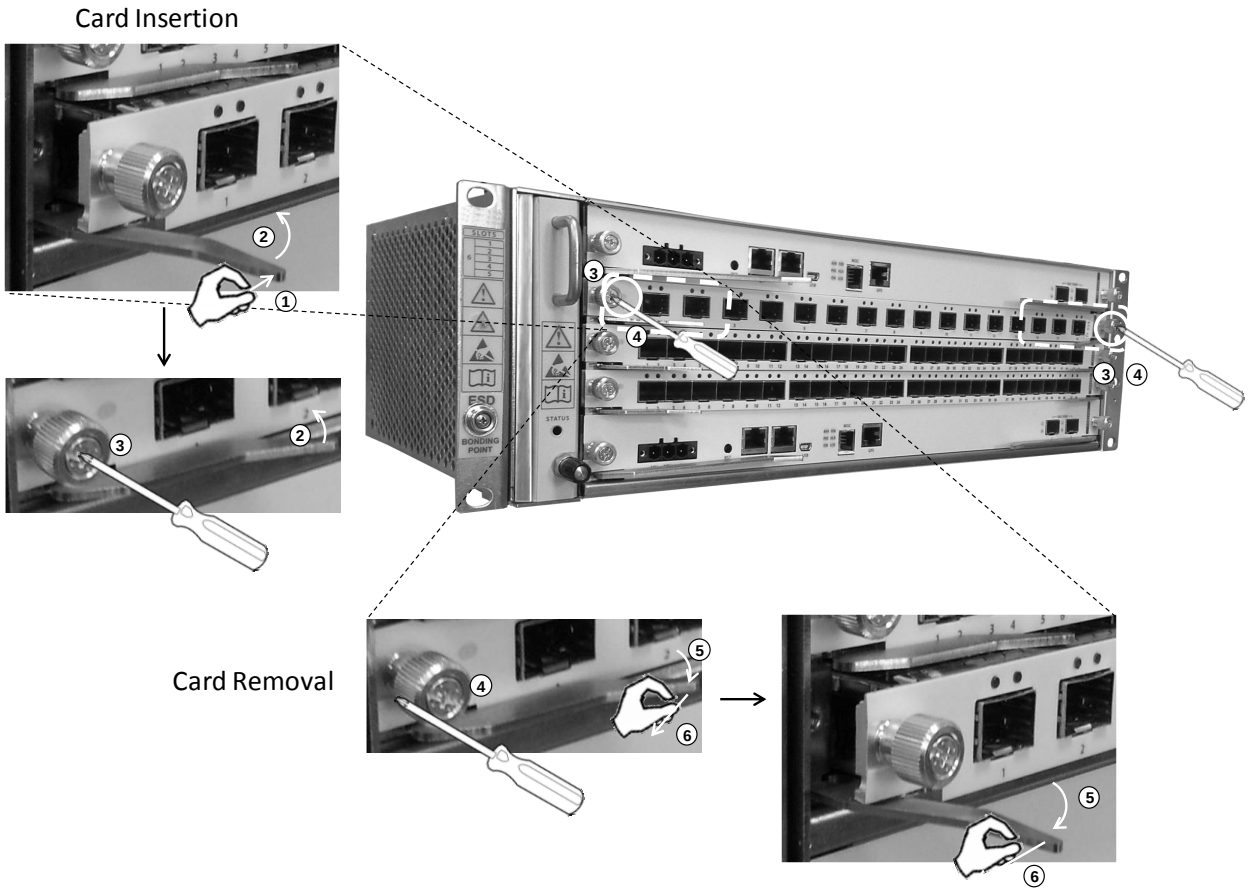
Step 5 Align the card with the open slot guides.

Step 6 Using the card handles in the top and bottom of the card front panel push the card to slide it into position, Figure 32-1.

Step 7 Push the card handles towards the card front panel, into place, Figure 32-2.

Step 8 Tighten the captive screws to secure card to the chassis, Figure 32-3.

Figure 32: Insertion/removal of cards handling procedures



CARD REMOVAL HANDLING PROCEDURES

Step 1 Identify the card to be removed

Step 2 Disconnect all cables from the card to remove

Step 3 Loosen the two captive screws in the front panel of the card, Figure 32-4.

Step 4 Using the card handles in the right and left side of the card front panel pull the card to slide out of the slot, Figure 32-5,6.

SFP+ and SFP INSERTION AND REMOVAL

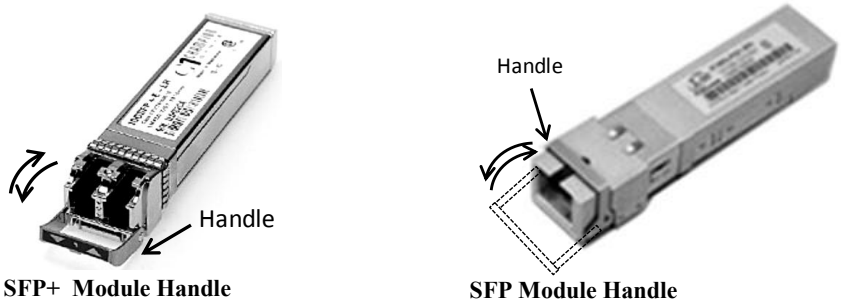
The SFP+ and SFP modules are equipped with a module handle in the front of the module to facilitate the insertion and removal of the module in the card module interfaces.

Important!

When performing OLT system service actions, observe electrostatic discharge (ESD) precautions, ESD

All SFP+ and SFP modules are hot swappable.

Figure 33. SFP+ and SFP module handle



SFP+ Module Handle **SFP Module Handle**

SFP+ and SFP MODULE INSERTION HANDLING PROCEDURES

Step 1 Identify the card and the module interface where the module must be inserted;

Step 2 Remove the SFP+ or SFP module interface cover (please see Figure 35)

Step 3 Remove the module dust cap, to be able to access and turn the module handle to the horizontal position , (please see Figure 33)

Step 4 Hold the module by the module handle;

Step 5 Position the module into the card module interface and push it into place.

Step 6 Release the module handle

Step 7 Cover the module with the module dust cap or plug in the adequate parch cord optical connector

SFP+ and SFP MODULE REMOVAL HANDLING PROCEDURES

Step 1 Identify the card and the module to remove;

Step 2 Remove the module dust cap, or disconnect the optical patch cord, to be able to access and turn the module handle to the horizontal position

Step 3 Hold the module by the module handle;

Step 4 Pull the module out of the card module interface;

Step 5 Release the module handle;

Step 6 Cover the module optical interface with the module dust cap;

Step 7 Cover the card module interface with the SFP+ or SFP module interface cover (please see Figure 35) or insert a new SFP+ or SFP module (please see module insertion procedures above)

MAINTENANCE

COOLING SYSTEM

The air enters the system in the front bellow being filtered by the air filter in the right side of the chassis. The cooling module pulls the hot air to the left side and out of the system to the back of the chassis.

Important!

For the correct cooling system function the air must only enter the system at front of the chassis passing through the air filter. All undesired air entries must be sealed, both to ensure proper system ventilation and prevent dust entry.

It is mandatory to use the blank panels provided with the chassis to cover the empty slots, Figure 34;

It is mandatory to cover the empty SFP+ and SFP card interfaces with the corresponding SFP+ or SFP interface covers, Figure 35;

It is mandatory to cover the unused optical card interfaces with the corresponding optical covers.

Figure 34. ME4605 OLT blank panels

Line card blank panel (9Ux4HP)

Switch fabric blank panel (9Ux6HP)

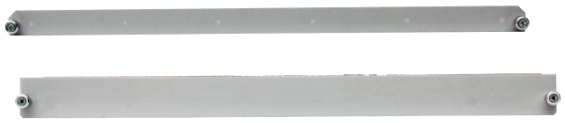


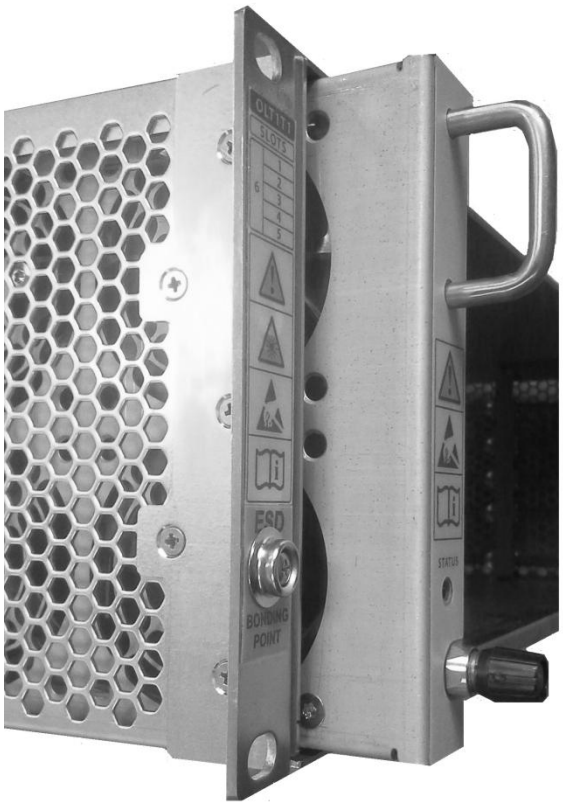
Figure 35. SFP+ and SFP interface covers

SFP and SFP+ interface cover

FAN MODULE

The OLT system has a single cooling module with two redundant FANS. In case of failure of one of the FANs, the air supplied by the adjacent units is enough for the proper functioning of the equipment.

Figure 36. OLT cooling module with two redundant FANS



The cooling system is subject to preventive maintenance to ensure proper operation. Depending on surrounding conditions (locations subject to higher room temperature or exposed to high concentrations of dust, such as outdoors) that period may be decreased.

The procedure for the cooling system maintenance must be complied with the verification; inspection; and cleaning of the cooling module. It is recommended that this intervention is made by replacing the cooling module by another, to minimize the time that the system is working without air circulation. The removed cooling module can be reused in another system after properly cleaned and inspected.

The FAN module can be replaced and is hot swappable. In order to replace the module, please refer to section FAN

LED INDICATOR

Each fan module has an LED, STATUS that must indicate the following states of the system:

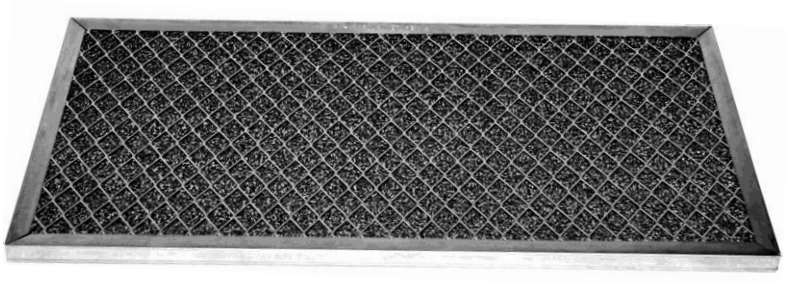
- Without ME4605-XCO-160 (switch fabric) on the chassis, the fan module blinks RED.
- The led remain to blink RED until the ME4605-XCO-160 start (takes appx. 3 minutes).

- If no problem occur, the LED must blinks GREEN (normal state), unless the environmental temperature exceeds +45C.

AIR FILTER

The OLT system has a single air filter, Figure 37 located at the side of the chassis.

Figure 37. OLT air filter



Filter maintenance is dependent on the environmental air quality in which the system is installed.

The filter should be checked, at a minimum, annually (8760 hours) and cleaned or replaced if there is evidence of airflow blockage.

In environments with high particulate matter, the filter should be checked, cleaned or replaced more often. Should the filter require cleaning, remove the filter from the server. See Removing the Air Filter. Take the filter to an open area and blow the particles from the filter using a can of compressed air. Do not use a coarse brush or anything abrasive since they may damage the filter.

FAN MODULE REPLACEMENT PROCEDURES

Important!

When performing OLT system service actions, observe electrostatic discharge (ESD) precautions ESD

Fan module is hot replaceable.

Be sure to have a replacement FAN module in order to minimize the time that the system is working without air circulation

A trained technician should execute the task in a couple of minutes.

AIR FILTER REPLACEMENT PROCEDURES

Important!

When performing OLT system service actions, observe electrostatic discharge (ESD) precautions, ESD

Be sure to have a spare cleaned Air Filter in order to minimize the time that the system is working without air filtering. A trained technician should execute the task in a few seconds.

AIR FILTER REMOVAL

Step 1 Locate the Air filter at the chassis

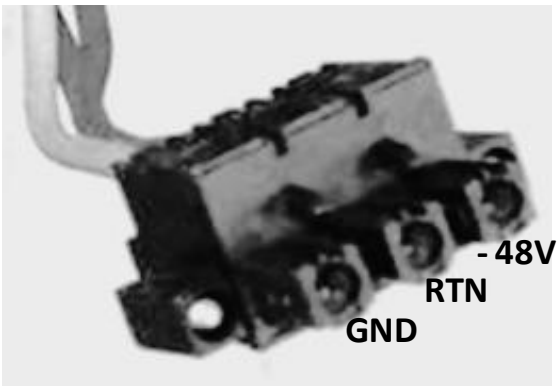
Step 2 Hold the Air filter with both hands, pull it towards you and slide it out of the chassis

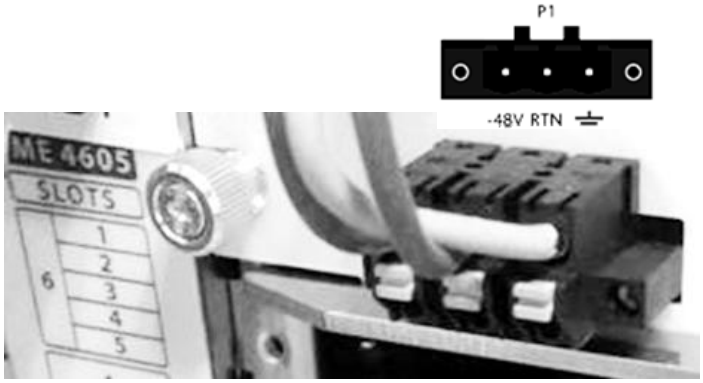
CABLES

ELECTRICAL POWER SUPPLY

The OLT electrical power supply inputs connection use H03VV-F cables which are provided with terminals as indicated in Figure 38. These cables consist of 6mm2 section and a length of 3m (GND – Green with Yellow stripes, -48V DC Blue and 0V-RTN DC Red), Figure 38.

Figure 38: Electrical power supply H03VV-F cables connection kit - terminals



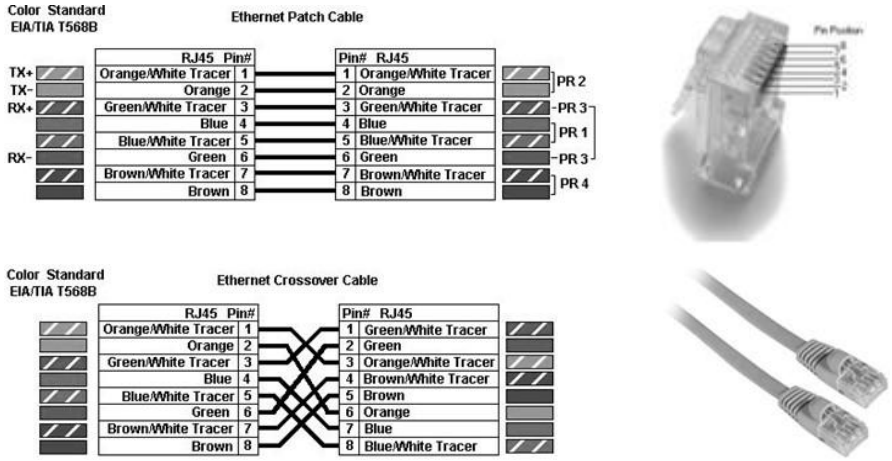


This GPON system operates from a supply voltage with -48VDC nominal value. It can work up from -40.5VDC to -57VDC in accordance with the recommendation ETSI EN 300 132-2 V2.1.1 (2003-01). The ground terminals links comply with the provisions of the recommendation ETSI ETS 300 253: January 1995.

ETH 10/100/1000 BASE-T

For the ETH 10/100/1000 BASE-T interfaces are used RJ45 connectors as indicated in the figure below. The expected range is 100m using UTP network cable category 5e or higher.

Figure 39. Ethernet Cable



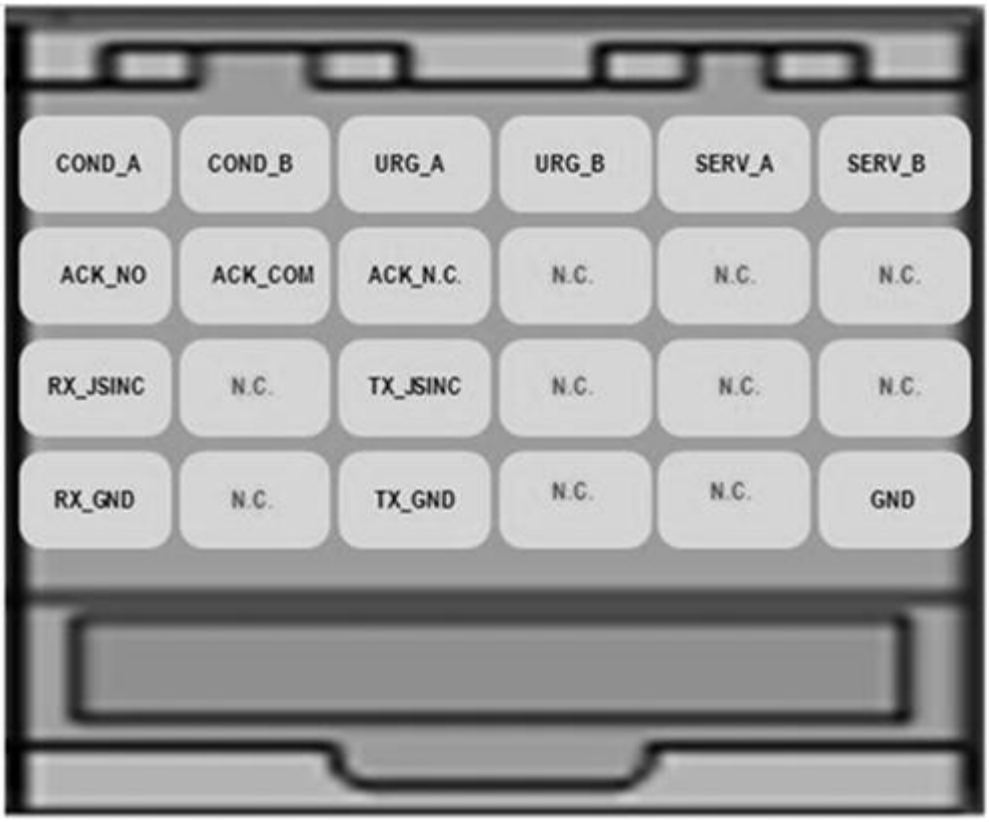
The ETH interface with an RJ45 connector is used for the management port (10/100 BASE-T) of the Switch Fabric card.

ALARMS & SYNCHRONISM

Through a Metral 2mm (FCI TM) plug, available on the front panel of the Switch Fabric card, are provided one junction for synchronism (Rx and Tx) at 120 or 75 Ohm, alarms, conditions and system ACK.

- Synchronism junction:
    - 75 Ohm/120Ohm
        - RX_JSINC/RX_GND;
        - TX_JSINC/TX_GND.
- 2x alarm port pairs:
    - URGENT pair:
        - URG_A/URG_B;
    - SERVICE pair:
        - SRV_A/SRV_B;
- 2x input conditions:
    - COND_A
    - COND_B

Figure 40. Switch Fabric card alarm/conditions and ACK Plug and PIN out



SYNCHRONISM JUNCTION CONFIGURATION

he synchronism junction available at the MISC plug at the frontal panel of the Switch Fabric card XCO-160 must be configured to 75 Ohm or 120 Ohm, by setting Switch 3 on the PCB located near the MISC plug, Figure 33 according to table.Table 19.

Figure 41. XCO160 Switch Fabric Board - I3 switch location at the PCB

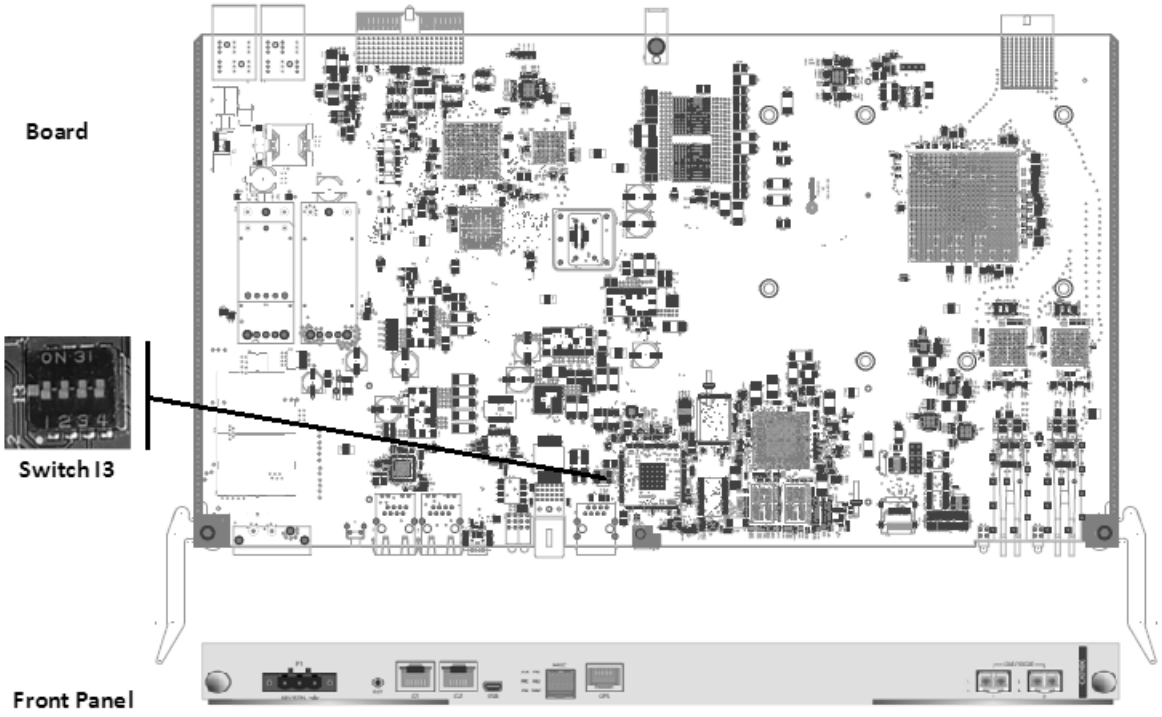


Table 19. XCO160 Dip switch I3 settings

Position	OFF (default setting)	ON	Notes
1	-	-	Without allocated function
2	TRING ≠ GND (120 ohm Mode)	TRING = GND (75 ohm Mode)	Note 1
3	RRING ≠ GND (120 ohm Mode)	RRING = GND (75 ohm Mode)	Note 1
4	-	-	Without allocated function
Note 1: Dip Switch I3, positions 2 e 3 are associated to the characteristic impedance of Frontal synchronism junction and should reflect the selected and configured functioning mode.			

OPTICAL

The optical interfaces used in OLT system are Multi Source Agreement (MSA) type in GPON variants (with SC-PC connectors), and in 10GbE XFP variants (with LC-PC connectors). The optical cables are patch cords terminated with the optical connectors to match the optical interfaces.

Figure 42. SC-PC connector

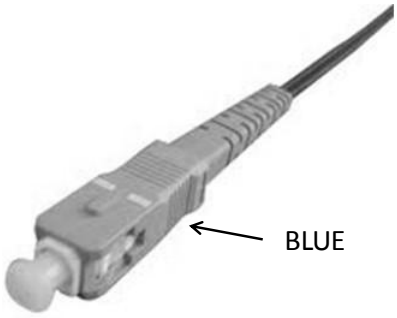
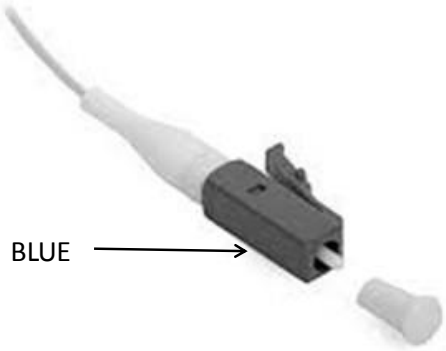


Figure 43. Connector LC-PC



OPTICAL INTERFACES

TRANSCEIVERS

The optical interfaces are supported on MSA standard modules with SFF, SFP and/or XFP type (10G Small Form-Factor Pluggable). SFP and/or XFP transceivers are pluggable thus allowing flexible.

SFP AND XFP OPTICAL TRANSCEIVERS

The XFP optical transceivers are the next generation SFP 10Gbps transceivers for singlemode and multimode fiber supporting multiple network protocols such as SONET/SDH, 10 Gigabit Ethernet (10GbE), CWDM communications, up to 80km.

Figure 44.Ethernet uplink XFP optical transceivers

GPON network interfaces of the OLT AMX-16G line card are in the form of SFP (small form factor pluggable) optical transceivers with SC/PC optical connector.

Figure 45. GPON optical pluggable transceiver

ELECTRICAL INTERFACES

ELECTRICAL FAST ETHERNET

RJ-45 connectors are used for Ethernet 10/100 BASE-T interfaces. The expected range is 100 meters using category 6 cable as described in the IEEE 802.3 recommendations.

Figure 46. RJ45 connector

INTERCONNECTOR:: RS232: OAM

To access the device via an USB port from a PC, an USB cable similar to the following image must be connected from the PC's USB port to the USB port of the OLT Switch Fabric unit. Note that it is an USB cable but the data communication is serial communication, since the Switch Fabric board has an internal USB-Series converter.

Figure 47. USB cable for serial communications

Chapter 5
CONFIGURATION

This chapter addresses the configuration of the equipment via local management.

SYSTEM MANAGEMENT

The OLT equipment can be managed locally simply using a web browser; via Web Ti application or using a Linux based Command Line Interface, CLI. The operation with the WebTi is described in the next sections of this manual. Option with CLI is described in section Chapter 7 CLI. Both WebTi and CLI provide the system with Local Craft Terminal (LCT) functionalities.

There are two different ways to manage the equipment:

- Connect to the management port (ETH), Figure 48
- Inband Management (using a management VLAN), Figure 49

To manage the OLT equipments, the OLT Ethernet management port must be connected to the Service Provider DCN, or connected directly to the PC Ethernet port.

There are two management ports, G1 and G2 in front panel of the Switch Fabric card.

G1 is the interface that should be used for the DCN connection, since it has a configurable IP address.

G2 is the interface that should be used for local access to the Equipment since it has a fixed IP address.

The PC to be connected to G2 must be configured with Fixed IP **192.168.200.200/24**. The OLT equipment IP is defined as **192.168.200.101** and **192.168.200.102** whenever active and redundant switch fabric cards are correspondingly enabled.

Notes

- Failure to configure PC IP(**192.168.200.200/24**) may lead to equipment malfunction.
- The OLT configuration done through WebTi will be flushed once the OLT is added to NMS server;
- The OLT configuration done in Webti will not be reflected in NMS and vice versa.

Figure 48. Managing OLT locally

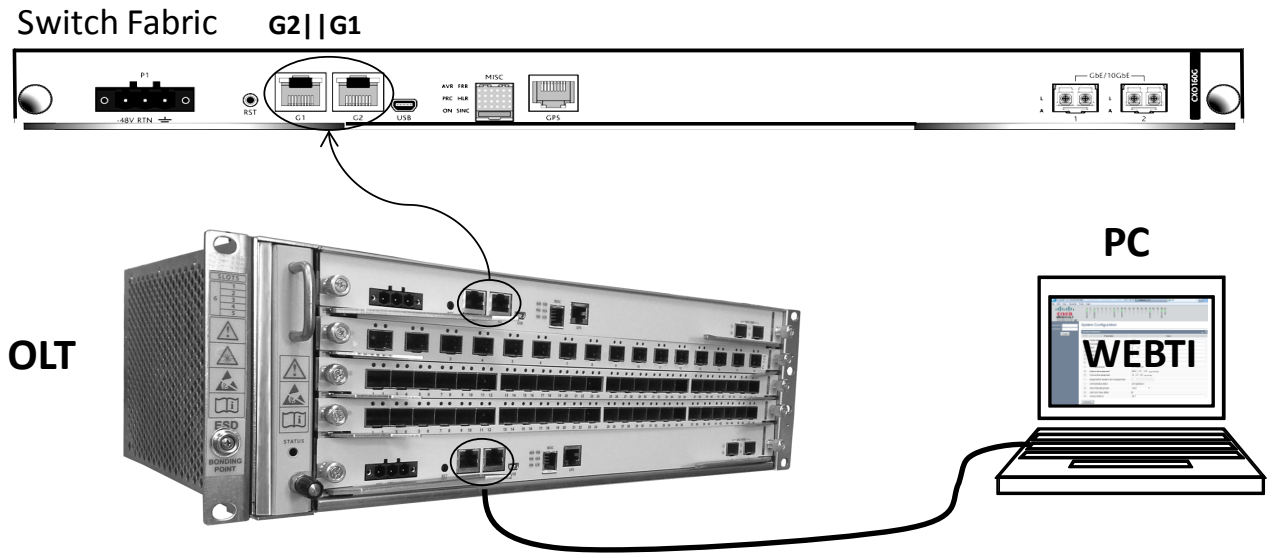
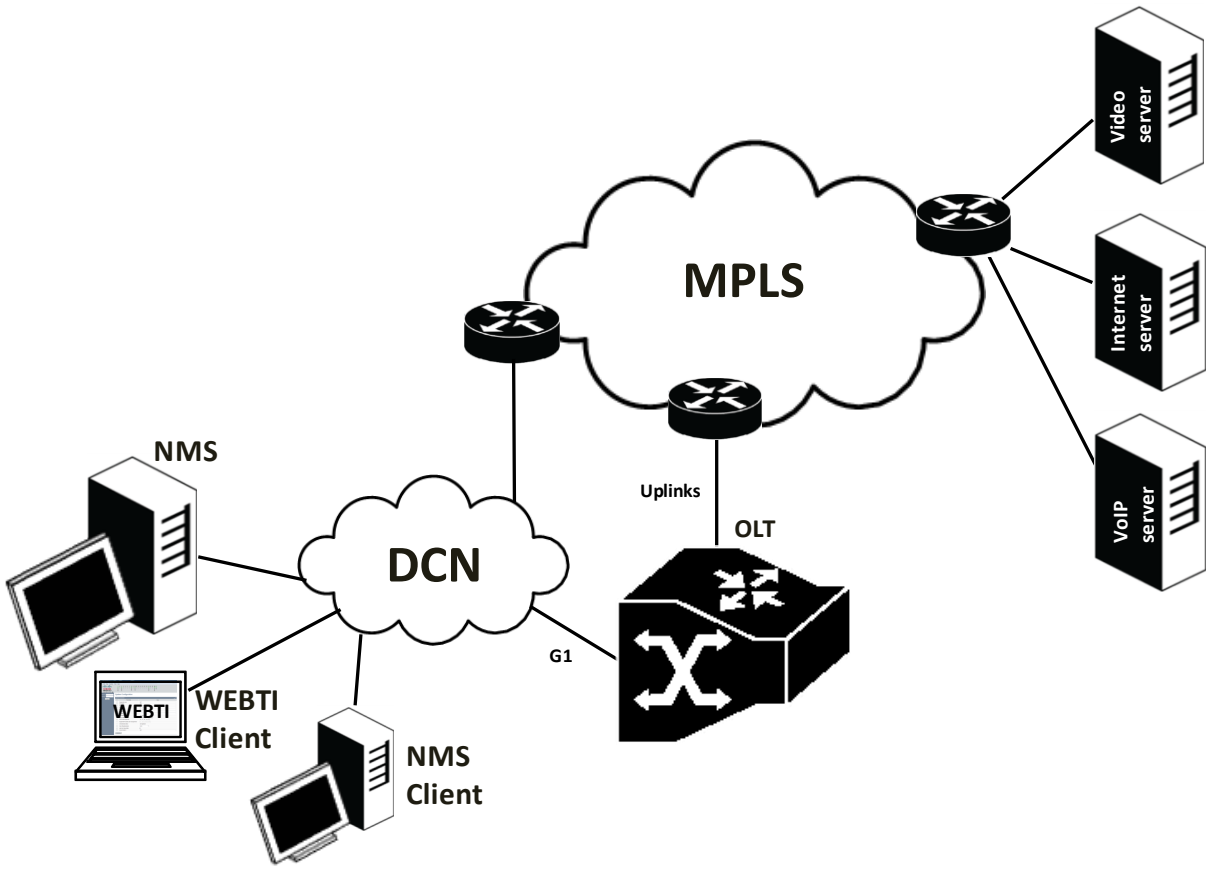


Figure 49. Managing OLT by the Management Network



To manage the OLT equipments by the Inband interface, there must be a management VLAN configured which interconnects MPLS network to the DCN.

SYSTEM REQUIREMENTS

To configure and check the state of the system with Web TI is necessary to use a Web browser, WebTi is compatible with Internet Explorer 6/7/8/9. To configure the system with CLI is necessary to use a CMD window.

CONFIGURING THE WEB BROWSER

This set of procedures described in this section must be followed in order to use WebTI application.

In the remaining subsections of chapter 5, Configuration and on chapter 6, Operation use of WEB TI application will be assumed and described.

References to the use of CLI for configuration and operation will be provided along the text to the appropriate subsection of chapter 7, where a detailed description of OLT equipment CLI usage is provided.

Despite the compatibility with IE8 and IE9, compatibility view mode must be made with this browsers, this option can be made near the place where the equipment's IP address is configured.

Generally in new browsers it may appear a button next to the URL called Compatibility View . This button should be activated because it allows browser compatibility with Web Sites designed for older browsers since menus, images, or misaligned text will be corrected.

Updating configuration dialogs or status will only occur in the opening or, if required, pressing the IE refresh button or

buttons in the various windows. If in doubt delete temporary files as described below.

CLEANING THE COOKIES AND TEMPORARY FILES

For the correct operation with WebTi it is necessary to clean up the cookies and the temporary files. In the Internet Explorer options, in the General tab the user must click in Delete.

In the Delete Browsing History Window the user must click in the option "Delete all…".

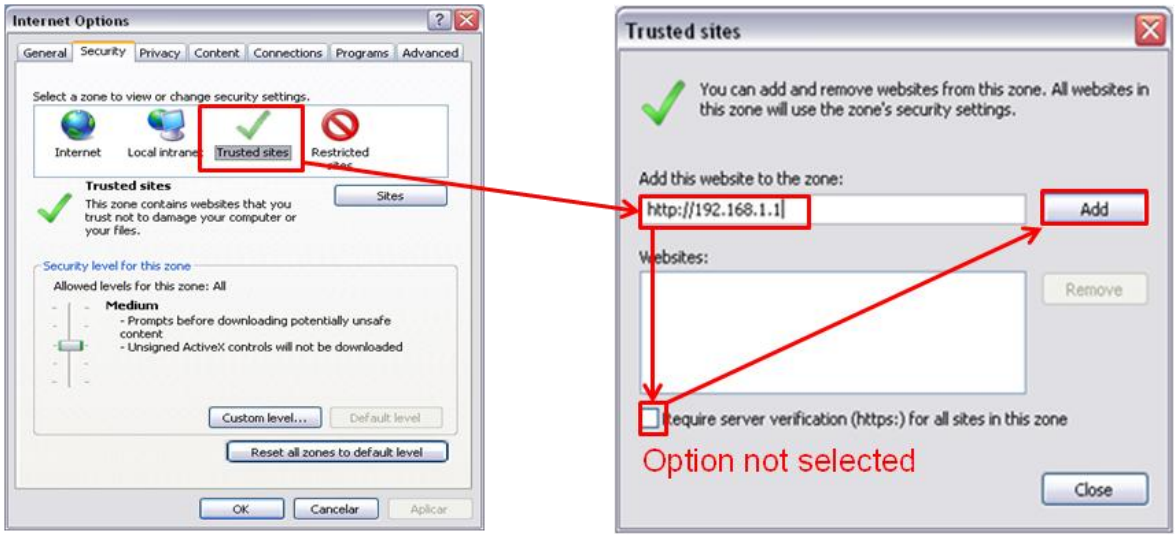
Figure 50. Internet Explorer Configuration

TRUSTED SITES

For the correct operation with WebTi is necessary to configure the Trusted Sites of the Web Browser. In the Internet Explorer options select the Security tab, then select the Trusted Sites option and click in the button Sites.

In the Trusted Sites Window introduce the equipment IP address and select Add, the "Require server verification (https:) for all sites" must be unchecked.

Figure 51. Trusted Sites Configuration

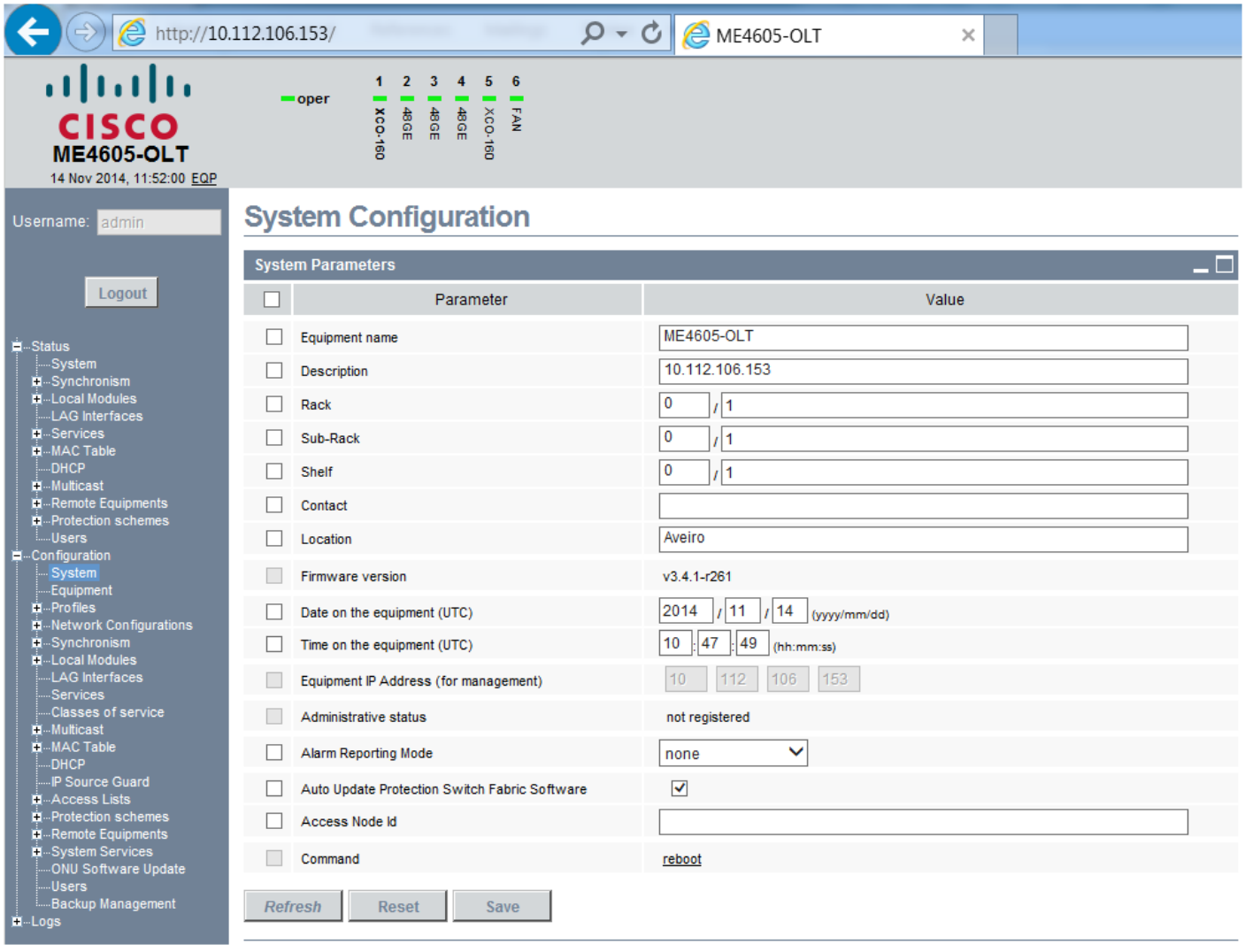


WEBTI

ACCESS TO THE EQUIPMENT

At the web browser window insert the equipment IP address to access. The equipment WEBTI interface main window will be displayed.

Figure 52. Web Ti equipment main window for access



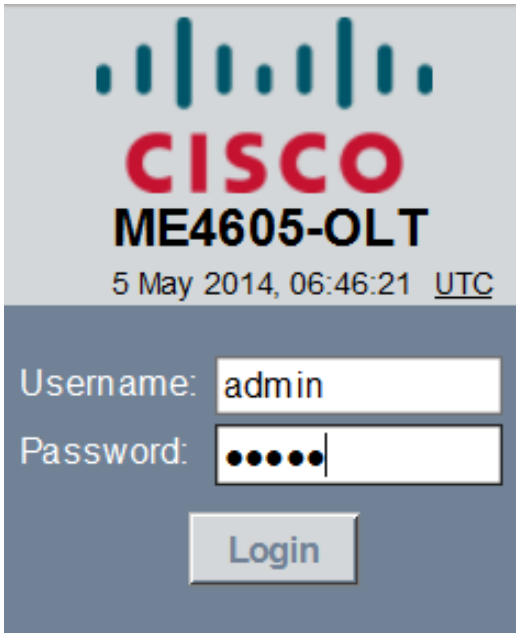
ACCESS CONTROL

To Access the menu it is necessary the user to be logged in, for that the user must type the login and password.

The system provides three default users, with different privileges for the operations that can be performed in the system. Can also to change each system users' password.

- Admin
    - Full access, configuration of the equipment and of the accesses to the system: users'' list and permissions
- Power
    - OLT configuration permission; cannot view or manage the system users' list
- Guest
    - Viewer permissions only: status and logs information access

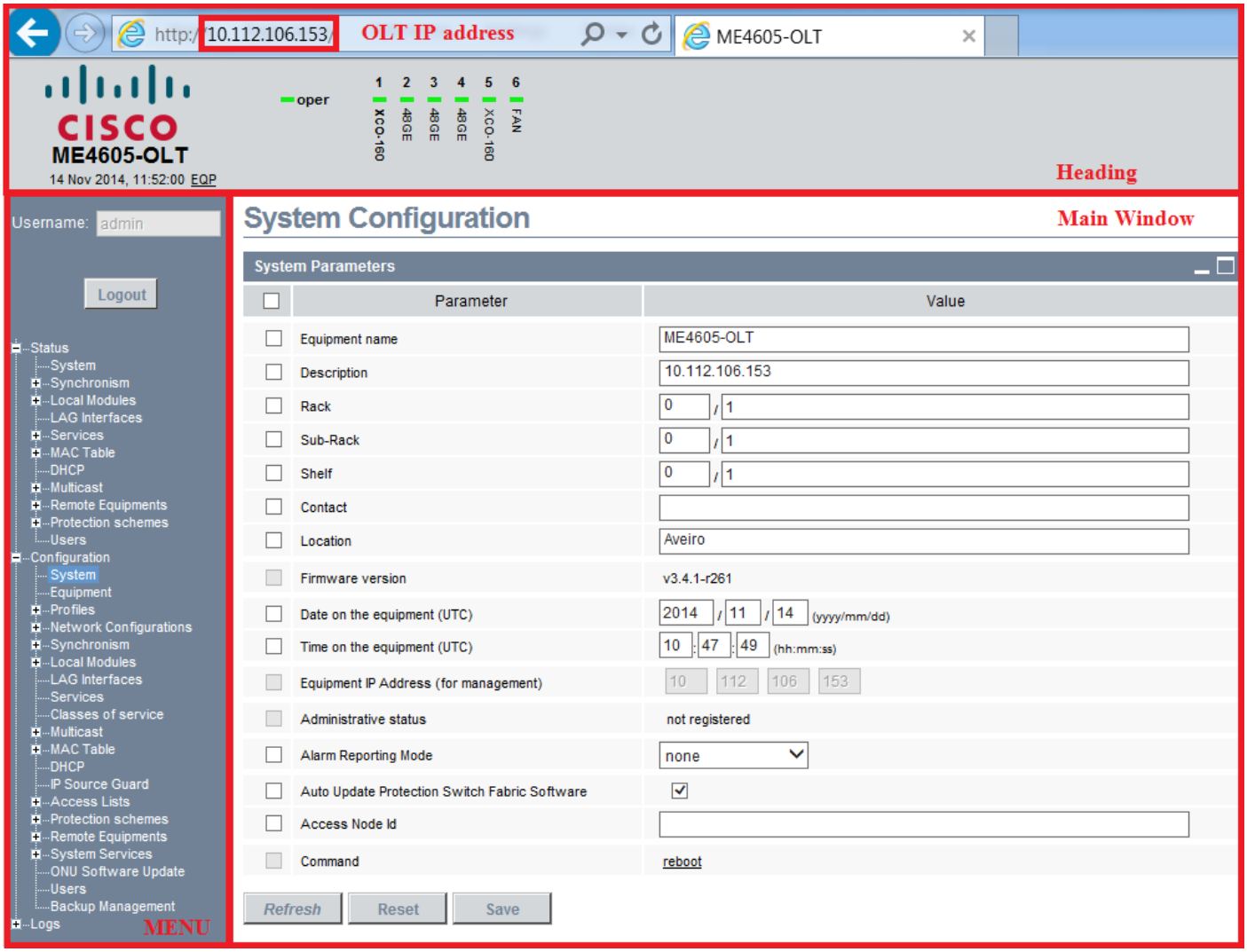
Figure 53. Access Control



WEBTI GENERAL DESCRIPTION

The WebTi is divided in three different areas: Menu, Heading and Main Page. These three areas are marked in Figure 54

Figure 54. WebTi Areas



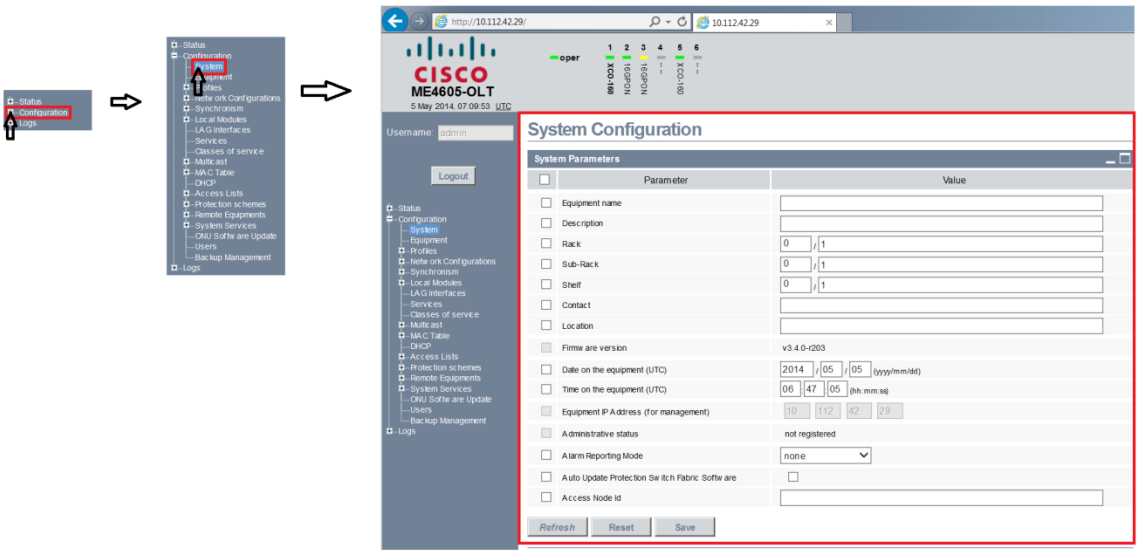
If using CLI, a CMD window should be used and CLI command run in this window. CLI has an hierarchical structure with nodes and subnodes. The prompt indicates where in the navigation tree the user is currently positioned. In each node/subnode a set of command is available depending on the particular node/subnode. CLI general usage indications are provided in sections CLI OVERVIEW and subsections.

MENU

In the menu all the options to configure and check the equipment status are available. By clicking on "+" the menu expands or "-" the menu collapses to the original position.

The main window displayed content corresponds to the selected item in the menu, Figure 55.

Figure 55. OLT Web Ti Menu navigation



In CLI application the tree command shows all the sub nodes with origin in the current node and commands available per node/sub node, see CLI TREE. The tree command executed in the root node, will display the complete CLI tree, Figure 234.

HEADING

The Heading has information related with the boards available in each slot of the OLT equipment.

That information is typically represented by graphic LEDs with different colors. It is possible to check the WebTi version by passing the mouse over the equipment's name, Figure 56.

The meaning of the LED's is the following:

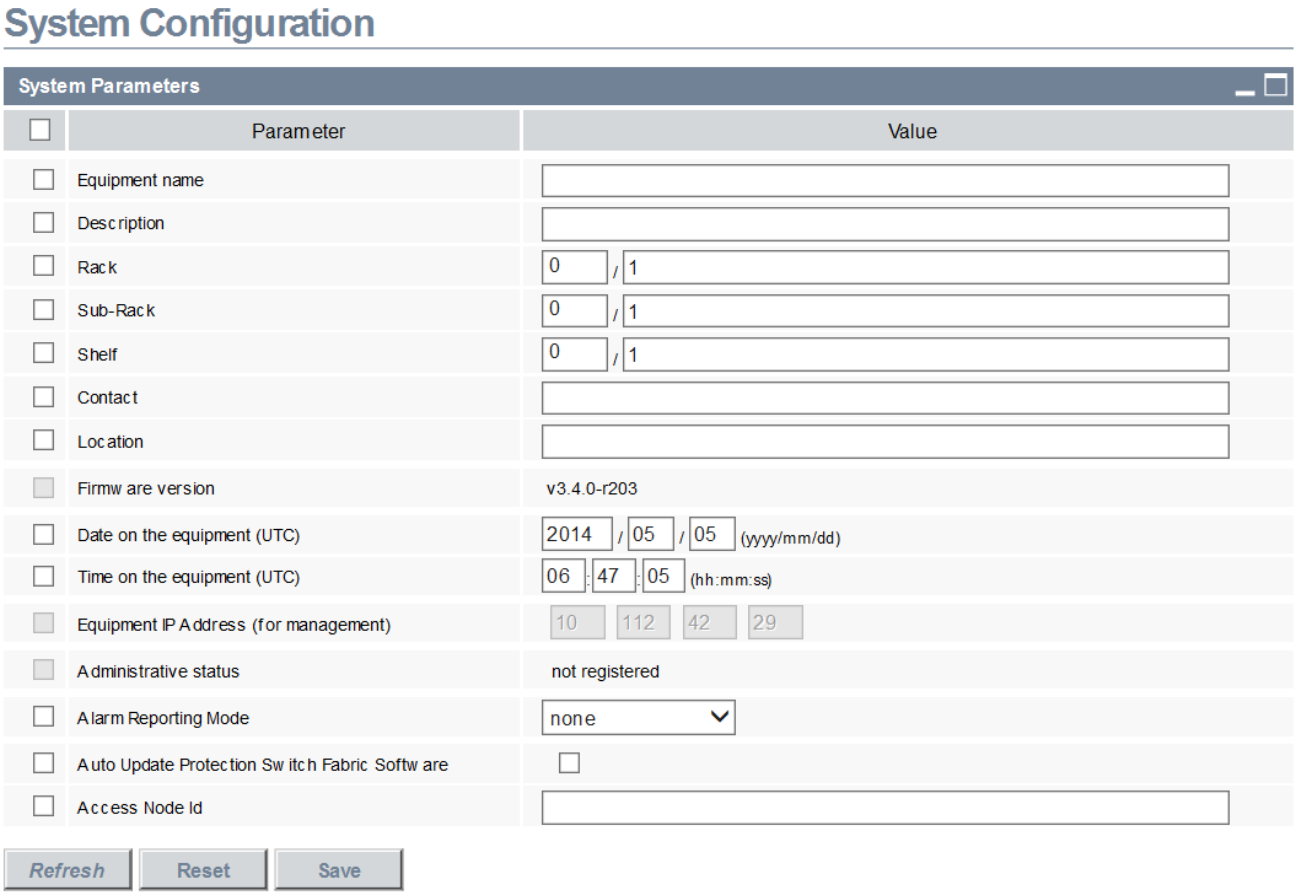
- Off – There is no board registered in the slot;
- Green – The board is operational;
- Yellow – The board is registered but absent from the system;
- Red – There is a conflict between the registered and the inserted board;
- Blinking Green – There is a new module/interface in the slot/system;
- Blinking Red – The board is in processing state.

Figure 56. Web TI heading

MAIN PAGE

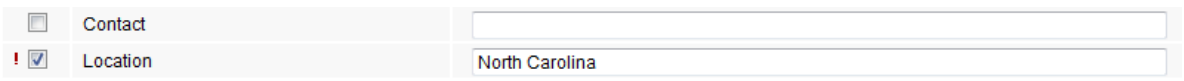
In the Main Page it will appear the page selected in the Menu section in order to configure the system, to check the system status or to view the Alarm/Events log registers.

Figure 57. OLT Main Page



The fields changed in the table are marked with an exclamation mark (!) in the corresponding line where the changes are made.

Figure 58. Tables Behavior



There are three or more options in each configuration page:

- Refresh: Refreshes the current page;
- Reset: Puts the values to the original value of the page;
- Save: Saves the configuration of the selected parameters.

SYSTEM CONFIGURATION

This menu provides general information about this system, and allows setting several parameters such as date, time and other custom fields.

Figure 59. OLT System parameters window

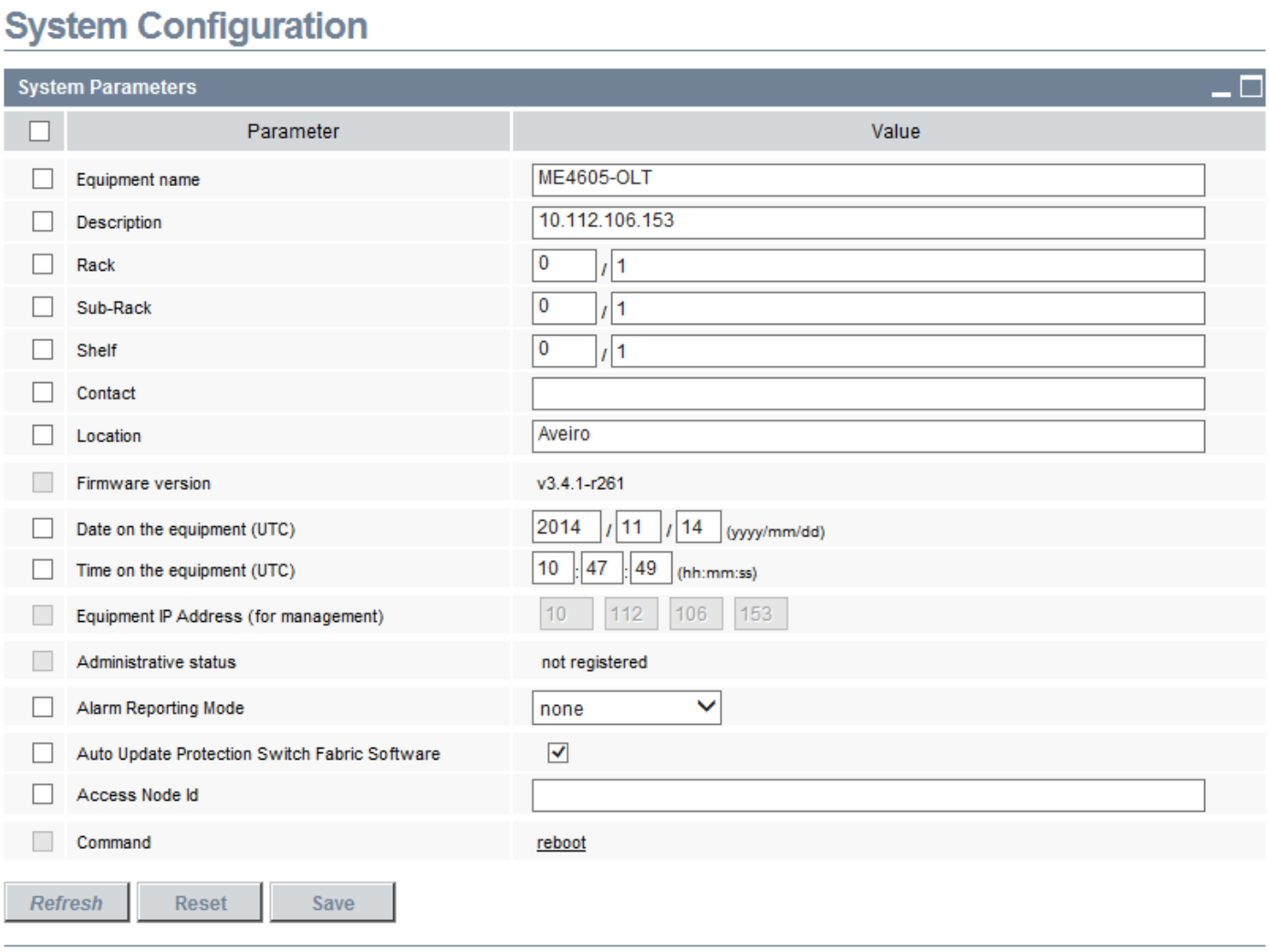


Table 20. System Configuration Parameters

Parameter	Description
Equipment name	Custom field used to tag the equipment (should be unique among all equipments). Example: OLT@North-Carolina
Description	Brief description of the equipment
Rack, Sub-Rack and Shelf	Numeric coordinates of the equipment cabinet position
Contact	Entity responsible for this equipment (department, person, etc)
Location	Custom field with the equipment location
Firmware version	Displays currently used firmware version
Date on the equip.	Displays/sets date on the equipment (UTC)
Time on the equip.	Displays/sets time on the equipment (UTC)
Equipment IP address(for management)	Displays currently configured IP address for local management
Administrative status	Equipment administrative status
Alarm Reporting Mode	HTTP manager sets WebTi as the configuration interface SNMP manager sets a SNMP agent such as NMS as the configuration interface
Auto Update Protection Switch Fabric Software	Enabled if selected
Access node Id	Displays access node identification
Reboot	Reboot OLT

For CLI usage, system configuration is described in section “system” sub-node.

EQUIPMENT CONFIGURATION

This menu provides information about the installed cards in the system. In addition, logical operations for adding and removing cards can also be performed. Placing the mouse over the card name, detailed information about the serial number, firmware and hardware versions are displayed, Figure 60.

CLI equipment Boards configuration is described in “boards” sub-node.

Figure 60. OLT Equipment configuration window

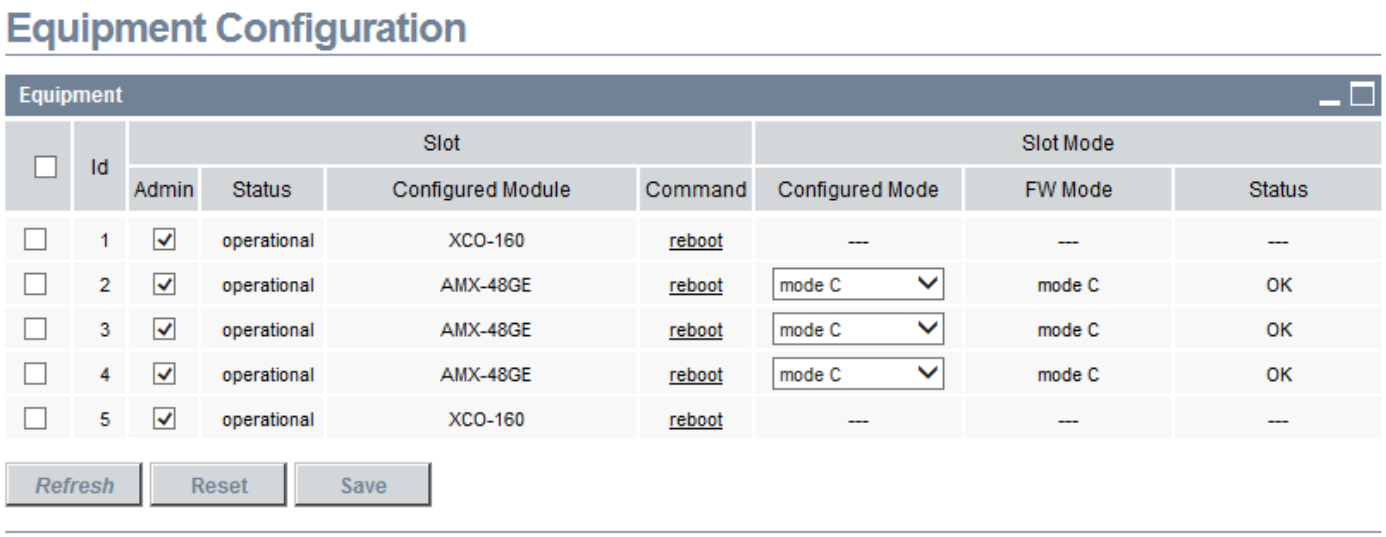


Table 21. Equipment Configuration Parameters

Parameter Group	Parameter	Description
	Id	Chassis Slot number where the card is inserted
Slot	**Admin**	Administrative state of the card
	Status	Each card can be in one of four states: **New board:** Card inserted the first time on that slot and it is ready for a logical insertion in the system; **Operational:** Card fully operational; **Configuration error:** Card with fatal errors on the initial flush of configuration; **Absent:** Card logically inserted in the system, but physically not present; **Proc.:** Card is starting up and making the initial configurations;
	Configured Module	Identifies the card inserted in the slot
	Reboot	Reboot card
Slot Mode	**Configured Mode**	Each slot can be configured in one of the four slot mode comfigurations: **Disabled:** No mode is configured for the slot **Mode B:** 4x10G interfaces and a total BW of 40Gb/s; this mode supports AMX-16GPON line cards **Mode C:** 1x40G interfaces and a total BW of 40Gb/s; this mode supports AMX-48GE line cards
	FW Mode	The Slot configured mode must be validated by the firmware layer depending on the switch fabric capacity; if validated assumes in this filed the value o f the configured mode (ModeA/ModeB/ModeC)
	Status	If configured slot mode is validated by the firmware layer this filed assumes OK value.

Notes

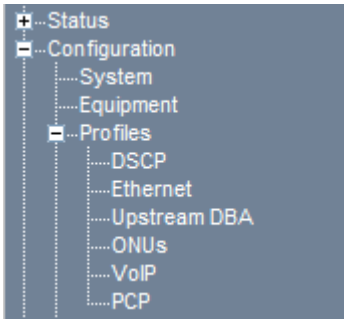
- Cards cannot be logically removed if they have any kind of configuration associated with it;
- Slots 1 and 5 are dedicated to Switch Fabric cards (XCO-160);
- No admin operations are allowed on slots 1, 5, since cards on those slots are automatically inserted in the system.

PROFILES CONFIGURATION

The Profiles configuration sub-menu has three items, Figure 61

- DSCP
- Ethernet
- Upstream DBA
- ONUs
- VoIP
- PCP

Figure 61. OLT Profiles configuration sub-menu



CLI profiles node, sub-nodes and available commands, including configuration are described in the “profiles” node section and subsections.

DSCP

DSCP profiles are used to characterize different CoS classification Ethernet profiles..

Figure 62. CoS classification Ethernte Profiles table

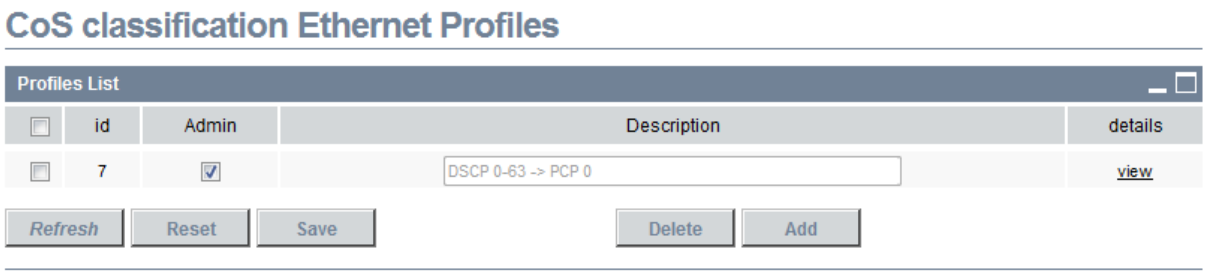


Table 22. CoS classification Ethernte Profiles Parameters table

Parameter	Description
Id	DSCP profile identification by number
Admin	Profile administrative state
Description	Description of the profile (text string)
Details	The selection of the view link on the Details column opens a DSCP profile configuration Dialog box with the DSCP profile details

Figure 63: DSCP add/details confguration dialog box

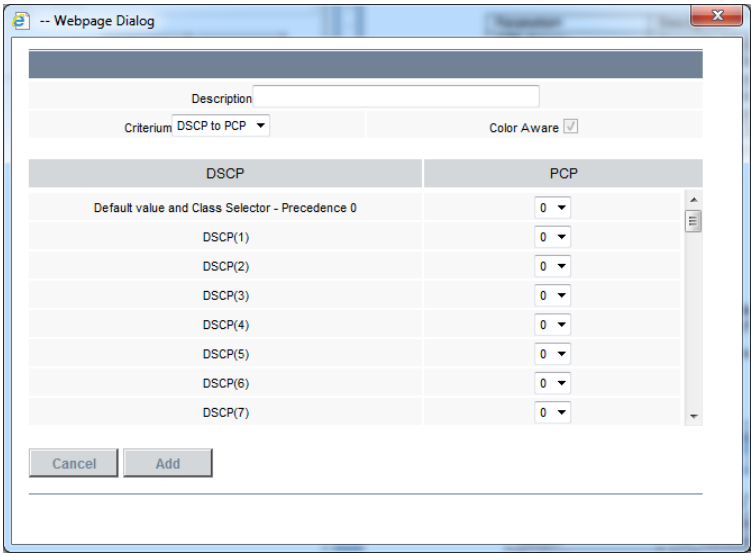


Table 23. CoS classification Ethernte Profiles Parameters table

Parameter	Description
Description	Description of the profile (text string)
Criterium	Type of used criterium for the class of service configuration (current available

	criterium is DSCP->PCP)
Colour Aware	Flag (enable|disable)
DSCP/PCP	DSCP to PCP mapping table

ETHERNET

Ethernet profiles can be created according to MEF naming convention. There are two default profiles created and they cannot be neither changed nor removed.

CLI Ethernet profiles configuration is described in section

"ethernet" sub-node ,subsection "config" command

Figure 64. Ethernet profiles

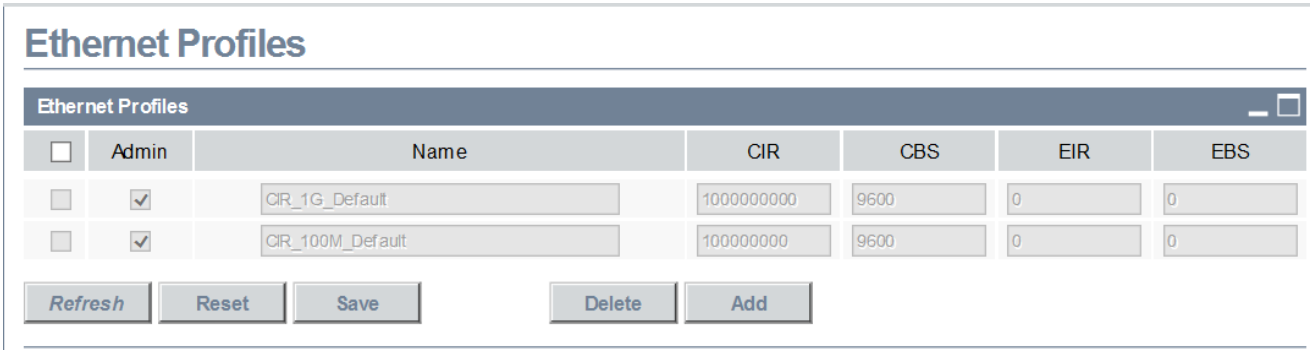


Table 24. Ethernet Profiles Parameters table

Parameter	Description
CIR (bit/s)	Committed Information Rate: bandwidth that "should" be guaranteed on average
CBS (bytes)	Committed Burst Size: maximum number of bytes in a burst of packets that "should" be guaranteed
EIR (bit/s)	Excess Information Rate: bandwidth in excess that can be supplied in case there is no traffic congestion
EBS (bytes)	Excess Burst Size: maximum number of bytes in a burst of packets that can be supplied in case there is no traffic congestion

Notes

- No spaces are allowed on the profiles names;
- Profiles in use cannot be neither changed nor removed;

GPON UPSTREAM DBA

The upstream profiles follow the Dynamic Bandwidth Allocation (DBA) feature described previously.

CLI Upstream configuration is described in section "upstream" sub-node, Command "config" command.

Figure 65. GPON upstream DBA traffic profiles

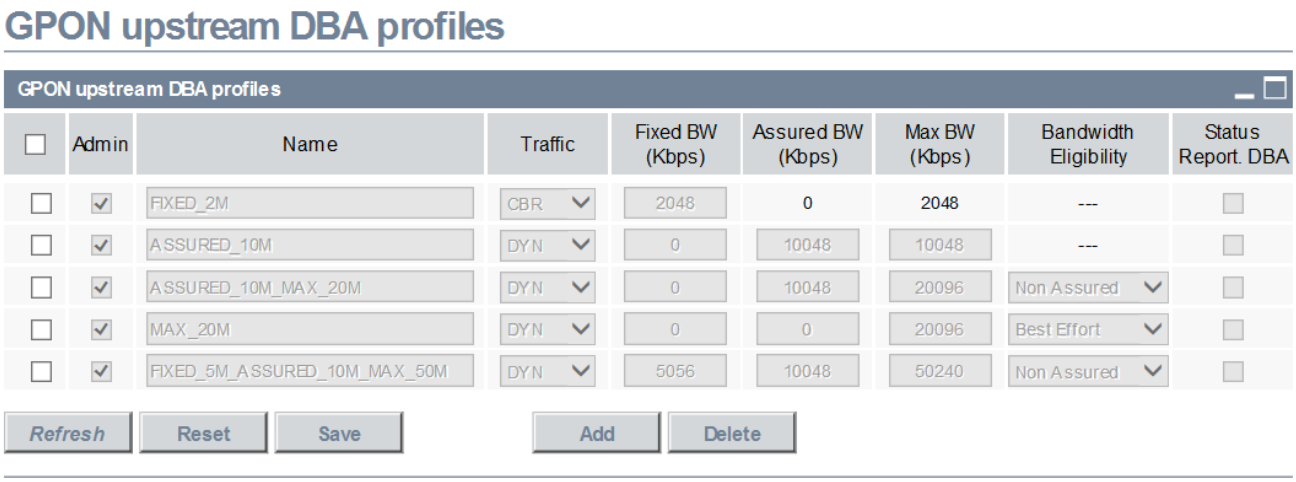
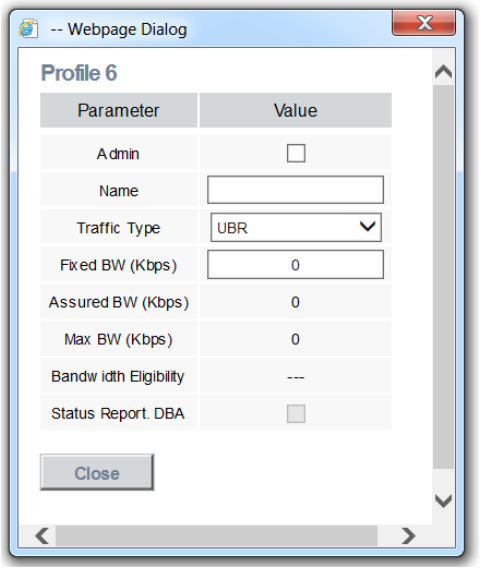


Table 25. GPON Upstream traffic profiles parameters table

Parameter	Description
Admin	Administrative state
Name	Profile name
Traffic	*CBR*: Constant Bit Rate *UBR*: Unspecified Bit Rate *DYN*: Dynamic
Fixed BW (Kbps)	Fixed bandwidth used in CBR and UBR types with a granularity of 8kbps and a maximum value of 400000kbps and 1200000kbps for CBR and UBR respectively
Assured BW (Kbps)	Maximum bandwidth for DYN type with a granularity of 8kbps and a maximum value of 1200000kbps
Max BW (Kbps)	Maximum bandwidth that results from the sum: *Fixed BW* + *Assured BW* + *bandwidth not assured*, with a granularity of 8kbps and a maximum value of 1200000kbps
Bandwidth Eligibility	Defines how the non assured bandwidth is handled. NOTE: *Best-Effort* T-CONTs are only attended if all *Fixed* and *Non-Assured* T-CONTs have their requirements satisfied
Status Report DBA	Flag. If selected a Status reporting MAC GPON DBA algorithm is used

There are five profiles created by default that represent the five types of T-CONTs. New profiles can be added through the Add button.

Figure 66. Add new upstream profile



ONUs

ONU profiles are used to characterize different ONUs according to their interfaces. By default, two profiles are created for SFU and 4GE-2FXS models.

In CLI ONUs profiles node and related commands including Configuration are described in Sub-Node “onu” sub-node.

By pressing the Add button there will be added a line to the ONT Profiles table

Figure 67. ONU profiles

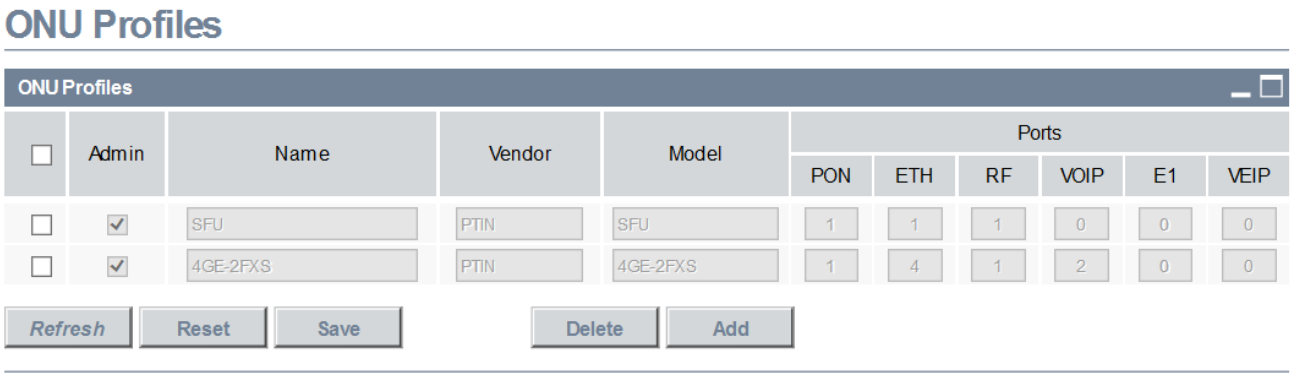


Table 26. ONU profiles parameters table

Parameter	Description
Admin	Administrative state
Name	Profile name

Vendor	Vendor name
Model	Model name
Ports	**Pon:** Number of GPON Ports(0|1) **Eth**: Number of Ethernet Ports **RF**: Number of RF Ports(0|1) **VoIP**: Number of FXS ports **E1**: Number of E1 ports **VEIP**: Number of Virtual Ethernet Interface Ports (0|1)

VoIP

VoIP profiles window is composed with two tables that are used to characterize different VoIP servers and FTP servers that store the XML files with the client information.

CLI VoIP profile related commands including configuration are described in section Sub-node “voip” sub-node

Figure 68. VoIP Profile configuration

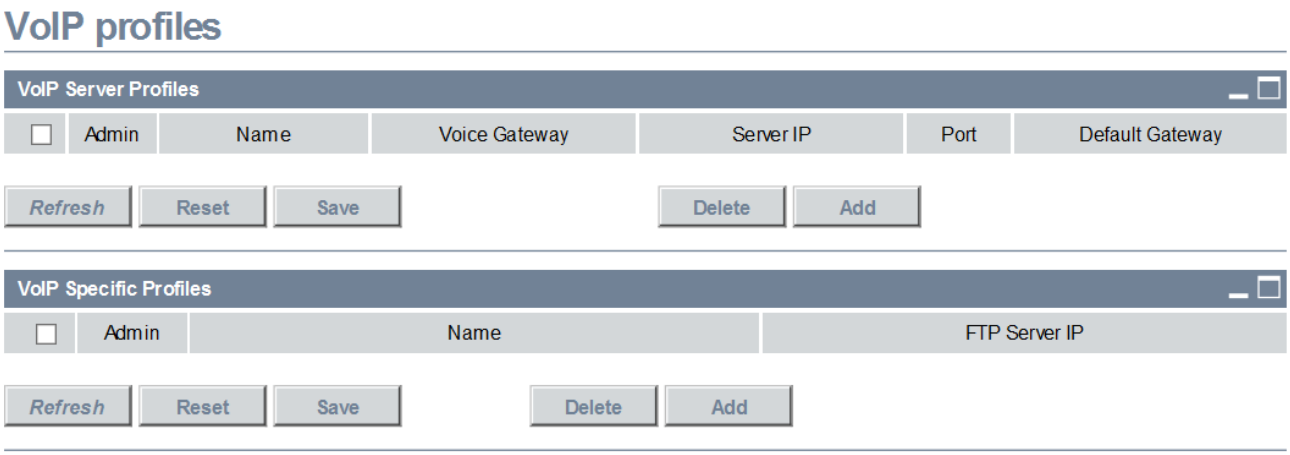


Table 27. VoIP Server profile configuration parameters table

Parameter	Description
Admin	Administrative state
Name	VoIP server profile name
Voice Gateway	Type of Voice Gateway used, it can be one of the following: • SIP-Nortel/Softswitch • SIP-Broadsoft • Megaco-v5.x • Megaco-Softswitch • Megaco-GR-303/TR-08
Server IP	VoIP server IP address
Port	Port used by the SIP protocol
Default Gateway	Default Gateway used for the clients to reach the SIP server

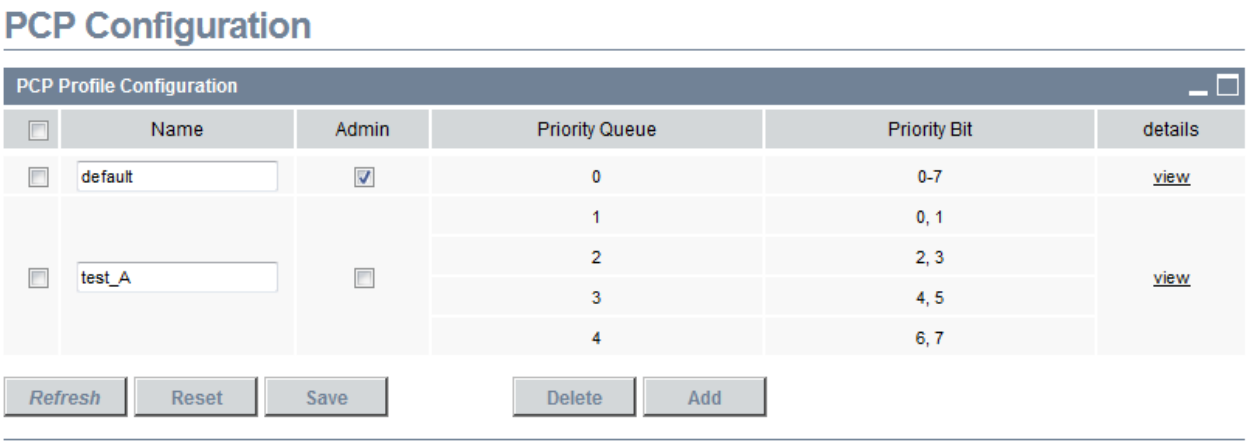
Table 28. VoIP specific profile configuration parameters table

Parameter	Description
Admin	Administrative state
Name	FTP server profile name
FTP Server IP	FTP server IP address

PCP

PCP profiles window is used to P-bit priority queues for the Upstream. Sevices defined on the ONUs can have a PCP profile associated defining the use of pbits for marking the upstream traffic.

Figure 69. PCP configuration



To add a new PCP profile use the Add button and a new line will be added to the PCP profile table. To configure the PCP profile priority queues select the respective view link at the details column. A priority queue configuration dialog box will open allowing the configuration of queues' priority bits, Figure 78. Save will update the PCP configuration table. In order to finalise the configuration and made the profile available for use, the profile must be named, the Admin flag must be selected.and the button Save used.

Figure 70 - Priority queue configuration dialog box

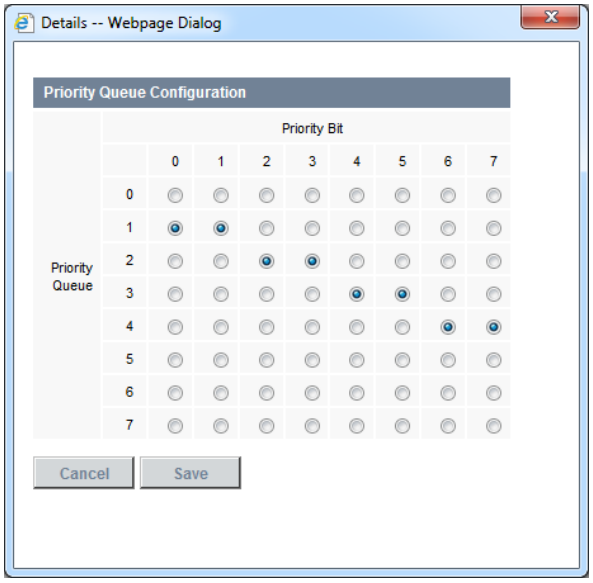


Table 29. PCP profile configuration parameters table

Parameter	Description
Name	PCP profile name
Admin	Administrative state
Priority Queue	Identification of profile priority queues by number
Priority bit	Identification of configured priority bits per queue
Details	The view link at this column. will open a priority queue configuration dialog box, Figure 78, showing the currently configured priority bits per queue for this PCP profile and allowing to change the configuration.

NETWORK CONFIGURATIONS

IP LAYER

This menu aggregates all configurations related with local and remote management interfaces.

For CLI usage, IP related commands including Configuration are described in section “ip” node, and following subsections.

Figure 71. OLT Network configurations – Global configurations

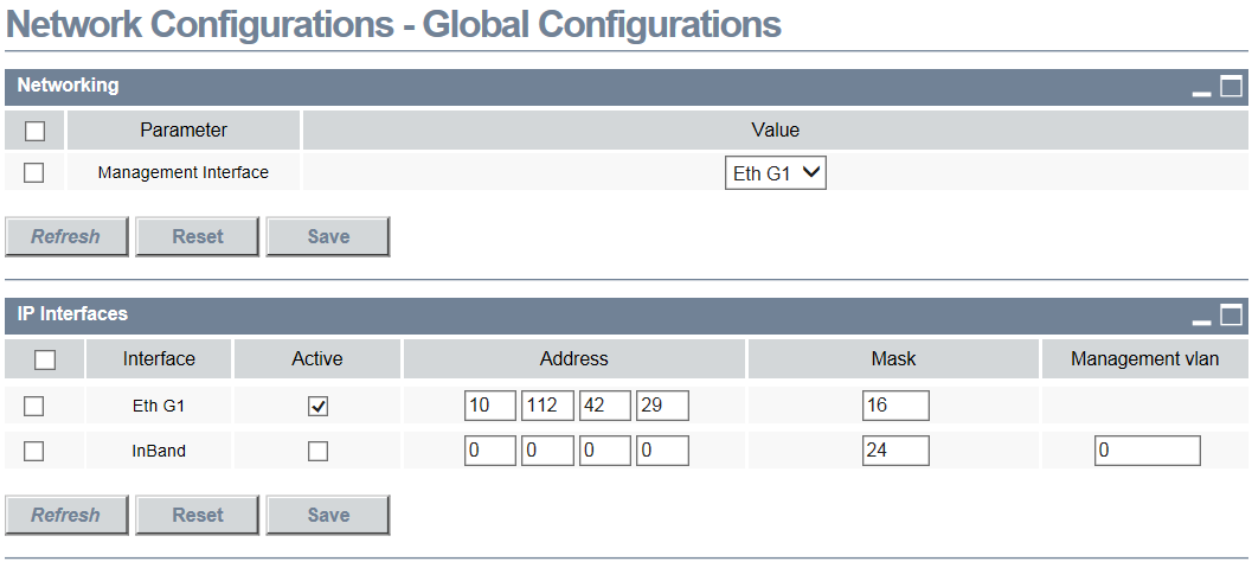


Table 30. Management interface configuration parameters table

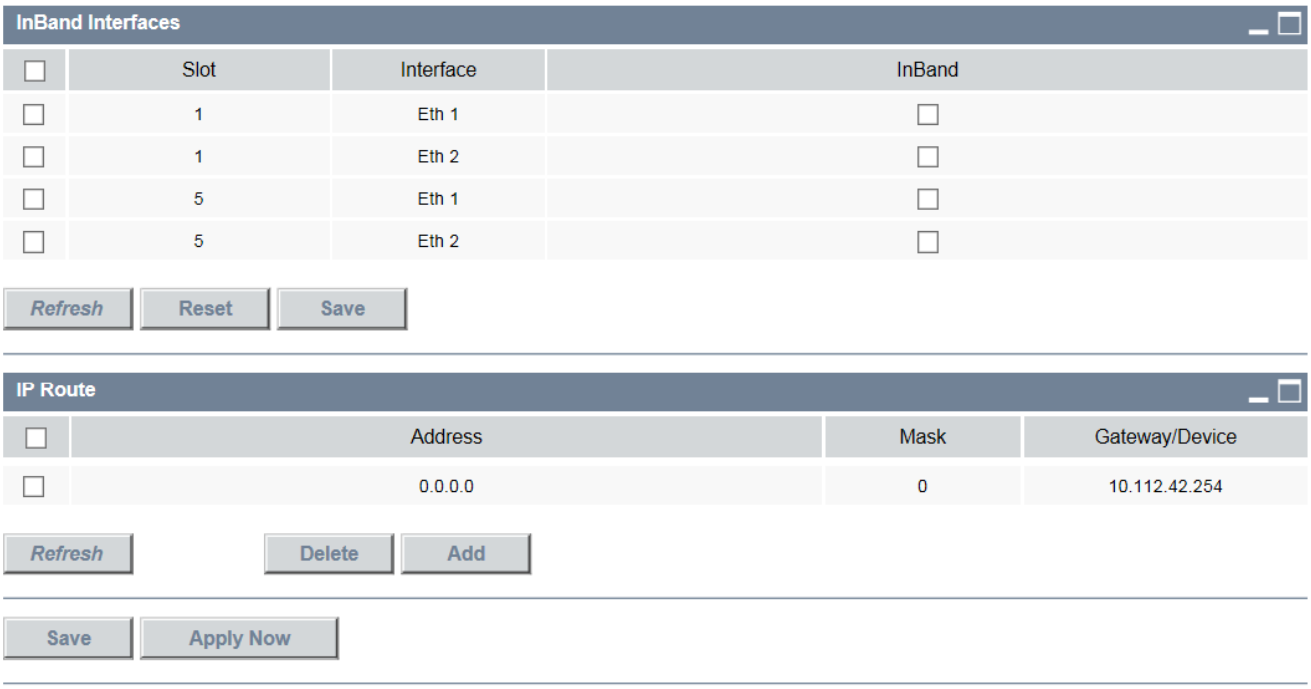
Parameter	Description
Management Interface	**eth:** management through local interface (RJ45 connector) **inBand:** management through the uplink interfaces

For each interface, an IP address can be configured and the respective network mask. For InBand, a VLAN must be used since the management traffic is mixed with other flows.

Table 31. Interface Configuration parameters table

Parameter	Description
Interface	Interface name
Active	Administrative state of the interface
Address	IP address of the interface
Mask	Network mask of the Interface
Management VLAN	VLAN identifier used in the inBand interface

Figure 72. Inband interfaces and IP Route configuration tables



It is also possible to select among all uplink interfaces which ones are used for the in band management. By selecting multiple interfaces, it means they will be connected in an E-LAN topology for that management VLAN.

Table 32. Uplink interface for InBand management configuration parameters table

Parameter	Description
Slot	Slot number of the uplink interface
Interface	Interface
Inband	If the interface is used or not to manage the system

Finally, a gateway may be configured on the system and it must belong to one of the networks configured previously through the IP + Netmask.

Table 33. IP Route - Gateway Configuration parameters table

Parameter	Description
Address	Destination IP Network
Mask	Destination IP Mask
Gateway/Device	Gateway to the configured network

SYNCHRONISM

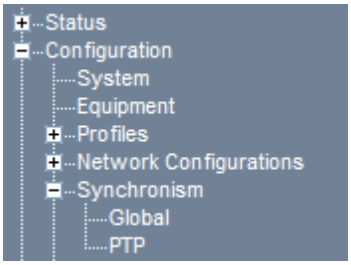
The synchronization block is physically located in the array units. It complies with G.781 and G.810 recommendations and is a category G.813 type I device.

- Internal oscillator ±1.5 ppm;
- Holdover deviation ±0.37 ppm per day;
- Possible simultaneous sources: 16 Slots; 2 external junctions;
- External sources: STM-N Ports, GbE and 10GbE NNI Ports, OTU Ports, 2Mbps Ports, 34Mbps Ports, 2MHz / 2Mbps input/output junctions;
- Priority and Quality (SSM).

The Synchronism configuration sub-menu has two items, Figure 60:

- Global
- PTP

Figure 73. Synchronism configuration sub-menu



In CLI, Synchronism node and sub-nodes as well as related commands including Configuration are described in section “synchronism” node and sub-sections.

GLOBAL

In the CLI section of this manual, synchronism global configuration is described in section “global” sub-node, command “config” command.

The system can synchronize the output frequency with one of two distinct references.

The tables of the following figures allow setting global synchronization parameters, as well as the system synchronization source (e.g. Eth interface), or in free run mode.

Figure 74. Synchronism Configuration Window- Synchronism table

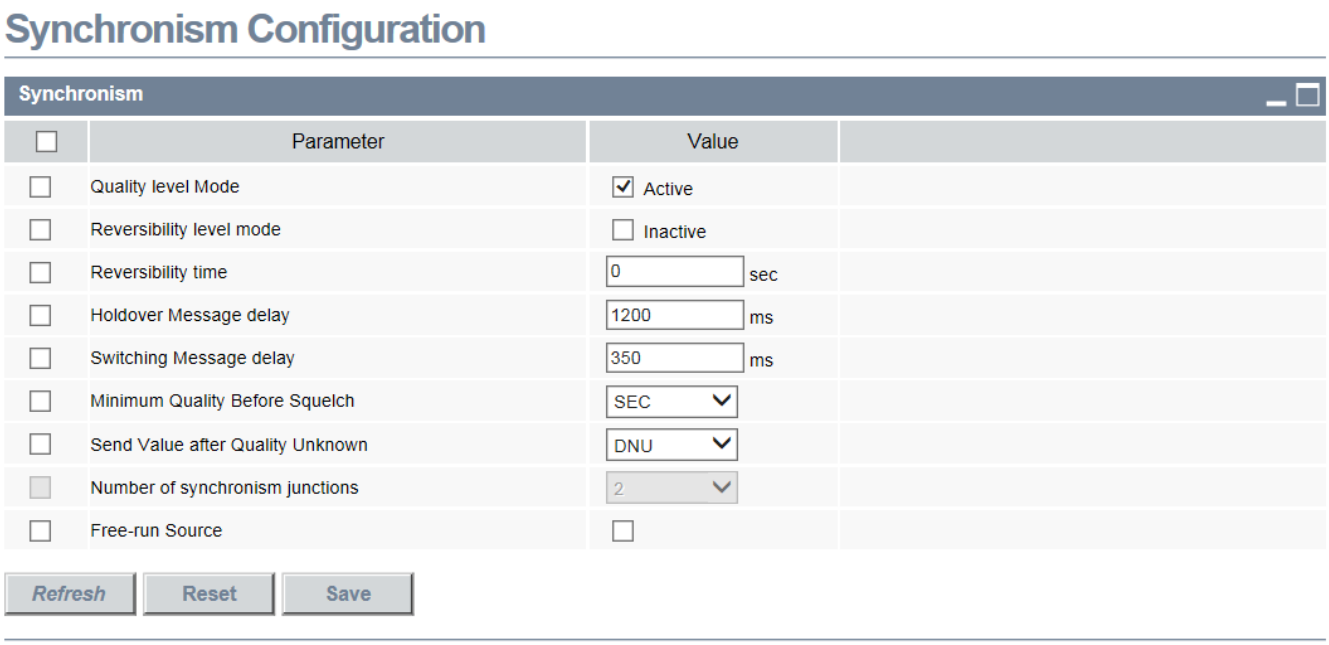


Table 34.Synchronism Configuration parameters table

Parameter	Description
Quality Level Mode	**Enabled**: the user can set the equipment synchronization to take into account the SSM synchronization sources (Synchronization Status Message) **Disabled**: the device ignores the SSM synchronization source.
Reversibility level mode	**Enabled:** the status machine of the equipment only considers for synchronization source, a source that does not show timing flaws and where the Reversibility Time has expired. If the quality/priority of this source (depending on the current configuration of the Quality Level Mode) is higher than the current source, the equipment will use this quality/priority source. Otherwise the source is not changed. **Disabled:** a source that has been previously considered invalid will only be used for synchronization, if the current source fails and if there is no other source with a higher quality/priority
Reversibility Time	Time, measured in seconds, after which, the fault condition disappears. After this time, the invalid source will be reconsidered for synchronization. This time is considered after the Wait-To-Restore time has elapsed
Holdover Message Delay	Time, in milliseconds, considered in the case where the equipment is in Holdover mode. This state is due to a fault condition in the selected synchronization source and when there is no other available source. QL (Quality Level) will be in QL_SEC when the delay is between 300ms and 2000ms (corresponding to the range of values for this parameter);
Switching Message Delay	Delay, in milliseconds, applicable in the case where changing to another synchronization source is carried out with a different Quality Level value. This delay sets the elapsed time between the trigger of the new synchronization source and a change in the output Quality Level. The range of values for the Switching Message Delay is between 180ms and 500ms
Minimum Quality Before	Minimum quality value; The equipment will squelch the synchronization source if

Squelch	there is no other source with a quality level equal to or better than the selected source;
Send Value after Quality Unknown	Value to be sent if Quality Unknown; The equipment will make the SSM output with the respective Quality Level configured if there is no synchronization source with a Quality Level other than Quality Unknown. The quality level SSM is selected from a combo box, Figure 75. The meaning of each selectable message is described in table Table 35.
Free-run Source	Free-run Source; With this option selected, the system always synchronizes with its internal clock (array unit PLL).

Figure 75. Synchronism Status Message Combo Box

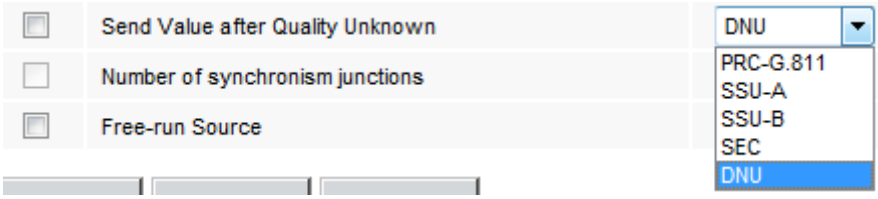
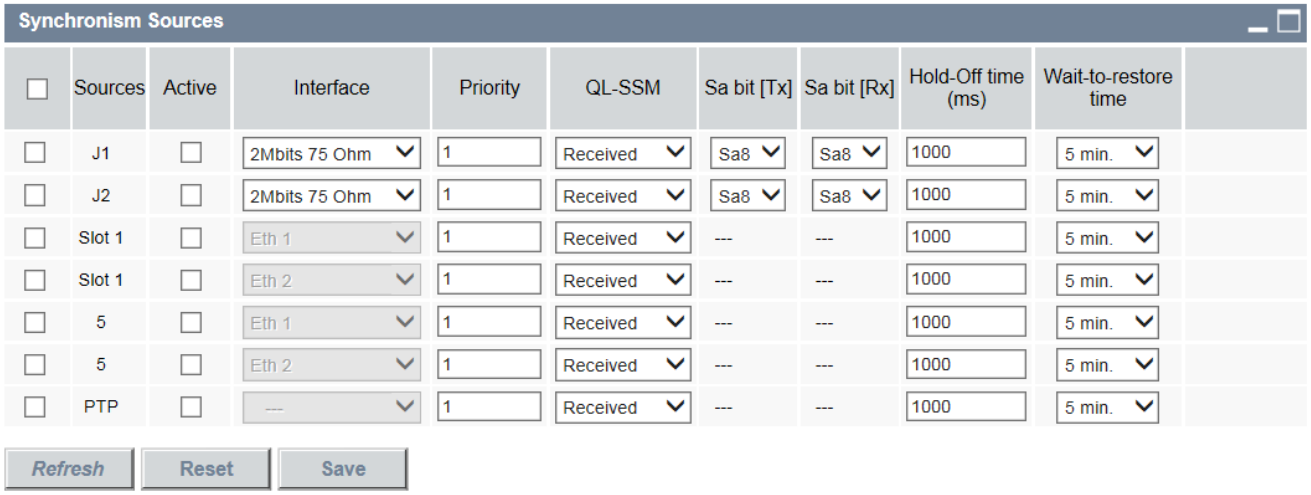


Table 35.Synchronization Status Message from the synchronization sources

SSM	Description
PRC-G.811	The synchronization source is a PRC clock, according to G.811 recommendation
SSU-A	The synchronization source is an SSU clock (Synchronization Supply Unit), type I or IV, according to G.812 recommendation.
SSU-B	The synchronization source is an SSU clock (Synchronization Supply Unit), type VI, according to G.812 recommendation
SEC	The synchronization source is a SEC clock, according to G.813, Option I recommendation.
DNU	The source should not be used for synchronization.

Figure 76. Synchronism Configuration Window- Synchronism Sources table



The following parameters can be configured in the source of synchronism table.

Table 36. Synchronism Sources parameters table

Parameter	Description
Sources	Lists all possible interfaces (slots and junctions) for synchronization
Active	Allows a given synchronization source to be enabled or disabled.
Interface	This column allows selection of an n Ethernet interface, within a certain module, which can be used as a possible synchronization source. In the case of the junctions, it is possible to configure if this operates at 2MHz or 2Mbits
Priority	Allows setting the source priority. The lower the priority value, the greater the preference of this source over the others. Note that, for sources having equal priority, the concept of reversibility has no meaning.
QL-SSM	Quality Level; The user can select the intended SSM value for the source. This value overrides the value received by the equipment. When the SSM value is overridden, the following precautions should be taken: In case of interface LOS, this source is not used. If the received value is DNU, the equipment will continue to use this synchronization source.
Sa bit [Tx]	Allows setting the value of the transmission Sa bit in the case of 2Mbps (only for the synchronization junctions);
Sa bit [Rx]	Allows setting the value of the reception Sa bit in the case of 2Mbps (only for the synchronization junctions)
Hold-Off time (ms)	The Hold-Off time ensures that the activation, even if short, of the signal failure has no influence on the synchronization source selection process. This value can vary between 300ms and 1800ms
Wait-To-Restore time	The Wait-To-Restore time ensures that a prior fault in the synchronization source will only be considered valid for this selection process if it is maintained without failure for a specified period of time. This parameter can have values ranging from 0 to 12 minutes with 1 minute resolution. The default value is 5 minutes.

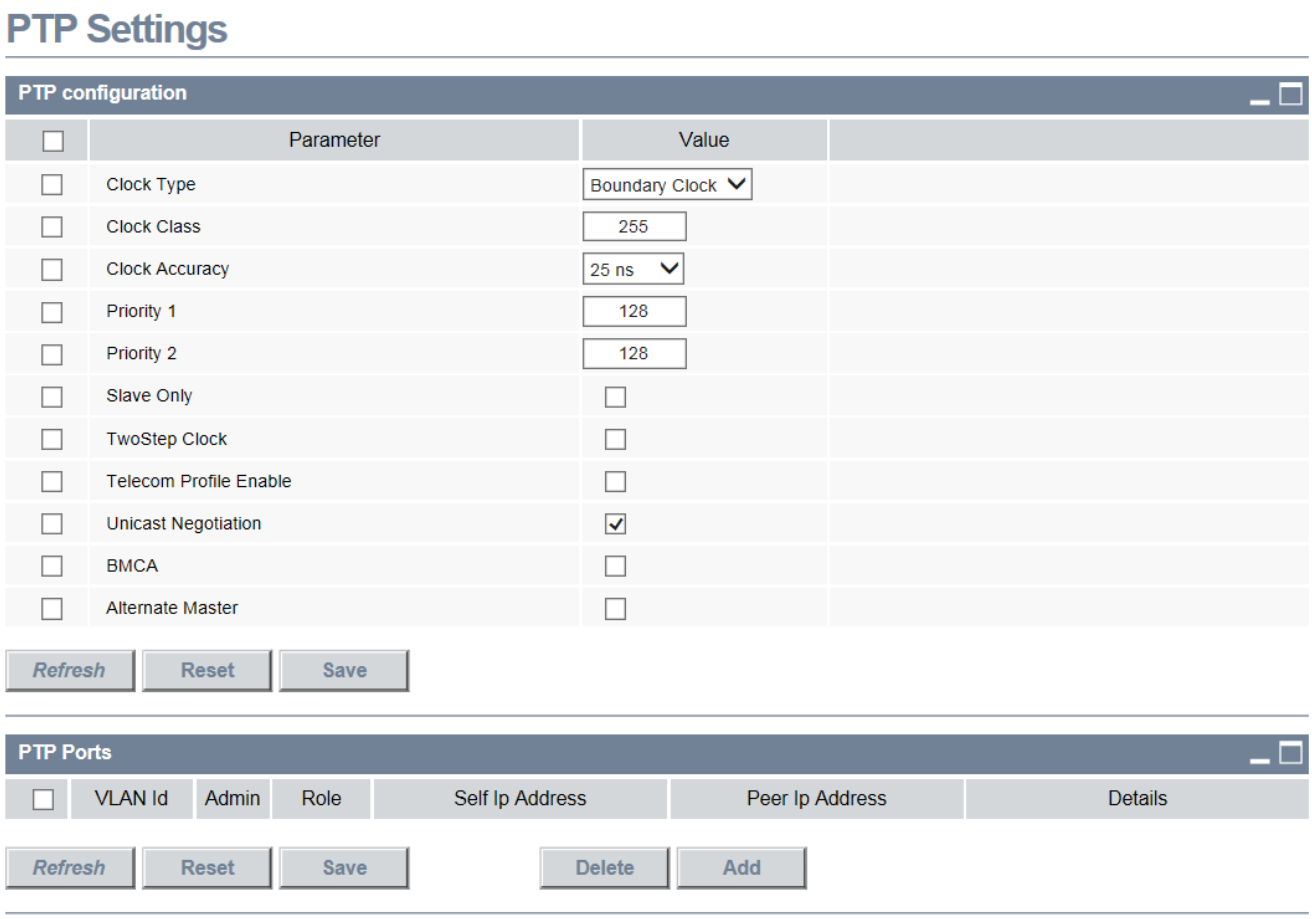
PTP

In the CLI section of this manual, PTP configuration is described in section Sub-node “ptp” sub-node and subsections

The PTP Settings window is composed of two tables, Figure 77:

- PTP Configuration;
- PTP Ports

Figure 77. PTP Settings Window



The following parameters can be configured in the PTP configuration table:

Table 37 . PTP configuration table parameters

Parameter	Description
Clock Type	**Ordinary Clock or Boundary Clock.** Ordinary Clock is used when the synchronism is configured as master or as slave. Boundary clock is used when it is necessary for the system to behave as a slave and as a master simultaneously.
Clock Class	Specify the default clock Quality class(0..255)
Clock Accuracy	Specify the clock Quality accuracy type

Priority 1	Override criteria for best master clock selection (1..253)
Priority 2	Specify a particular switch priority when criteria matches (1..253)
Slave Only	Enables slave only configuration of the PTP machine (enable|disable)
Two-Step Clock	Enables Two-step clock configuration of the PTP machine (enable|disable)
Telecom Profile Enable	If Enabled TeLecOm profile acocording to G.8265.1 is used to select the clock source
Unicast Negotiation	Unicast transmission at negotiated intervals
BMCA	Best Master Clock Algorithm Flag: if enabled BMCA algorithm is used to select the clock source
Alternate Master	Indicates that the message is transmitted by a port which is not in master mode

Table 38. PTP Ports table parameters

Parameter	Description
Vlan Id	Identifier of the VLAN used in the transport of PTP packets
Admin	PTP port administrative status
Role	If the PTP port must act as Master (only propagating synchronism) or Slave (only receiving synchronism)
Self IP Address	Origin PTP port IP, i.e. the actual PTP port that is being configured
Peer IP Address	Destination PTP port IP, i.e., the PTP port with which the port that is being configured will communicate.
Details	Selecting edit for a PTP Port a dialog box pops up, Figure 78, identical to the create PTP port dialog box, but showing the details for the specified PTP port configuration and allowing to change it.

The 1588 synchronization is propagated using an exclusive synchronization LSP. For this, it is necessary to associate the LSP to a PTP port in the "PTP Port" table. To do this the user must select the "Add" option. This will pop up a Create PTP Port Dialog box to configure the PTP port to create, Figure 78.

Figure 78. Create PTP Port dialog box

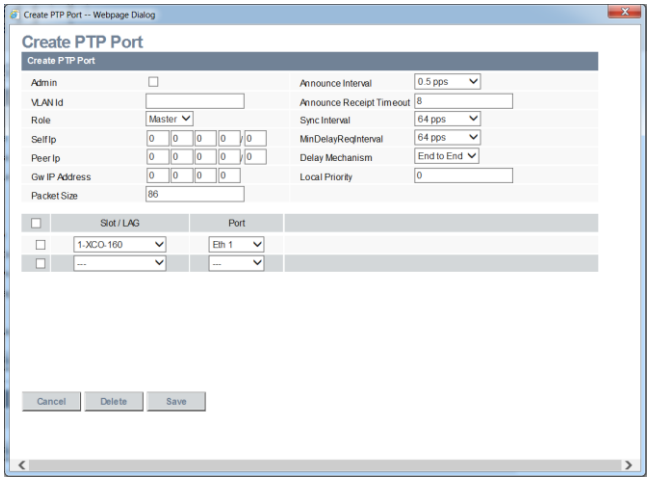


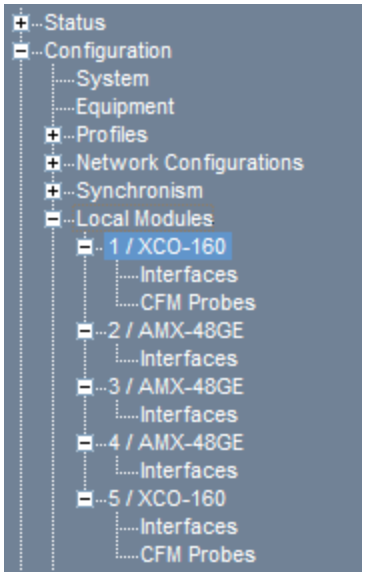
Table 39. Create PTP Port configuration parameters

Parameter	Description
Admin	PTP port administrative status
VLAN Id	Identifier of the VLAN used in the transport of PTP packets
Role	If the PTP port must act as Master (only propagating synchronism) or Slave (only receiving synchronism)
Self IP	Origin PTP port IP, i.e. the actual PTP port that is being configured
Peer IP	Destination PTP port IP, i.e., the PTP port with which the port that is being configured will communicate.
Gw IP Address	IP address of the Gateway to the destination network
Packet Size	Synchronism packets size
Announce Interval	Time interval between Announce messages
Announce Receipt Timeout	Number of Announce Interval periods that have to occur without receiving an Announce message before the occurrence of the Announce Receipt Timeout expiration event
Sync Interval	Average time interval between successive synchronization messages, i.e. when transmitted as multicast messages
MinDelayReqInterval	Minimum average time interval allowed between messages sent by a slave to a specific master port
Delay Mechanism	Option type for measuring the propagation delay used by the port
Local Priority	
Slot/Lag/Port	Corresponding to an LSP previously created in the **Services** menu of the card where the 1588 synchronization will take place

LOCAL MODULES

This section will cover the configuration for the various local modules in the equipment. The slot where the module is inserted is indicated by the slot number; as shown in the figure below; in this example 3/AMX-48GE indicates there is a AMX-48GE card inserted in Slot 3 in this equipment. Equipment configuration in terms of uplink and tributary line cards can thus be visualized by expanding the local modules sub-menu.

Figure 79. Local Modules configuration sub-menu



AMX-16GPON

In this window it is possible to configure the GPON Interfaces

In CLI, GPON interfaces related commands including configuration are described in section ““gpon” sub-node and subsections.

Figure 80. PON interfaces configuration – AMX-16GPON

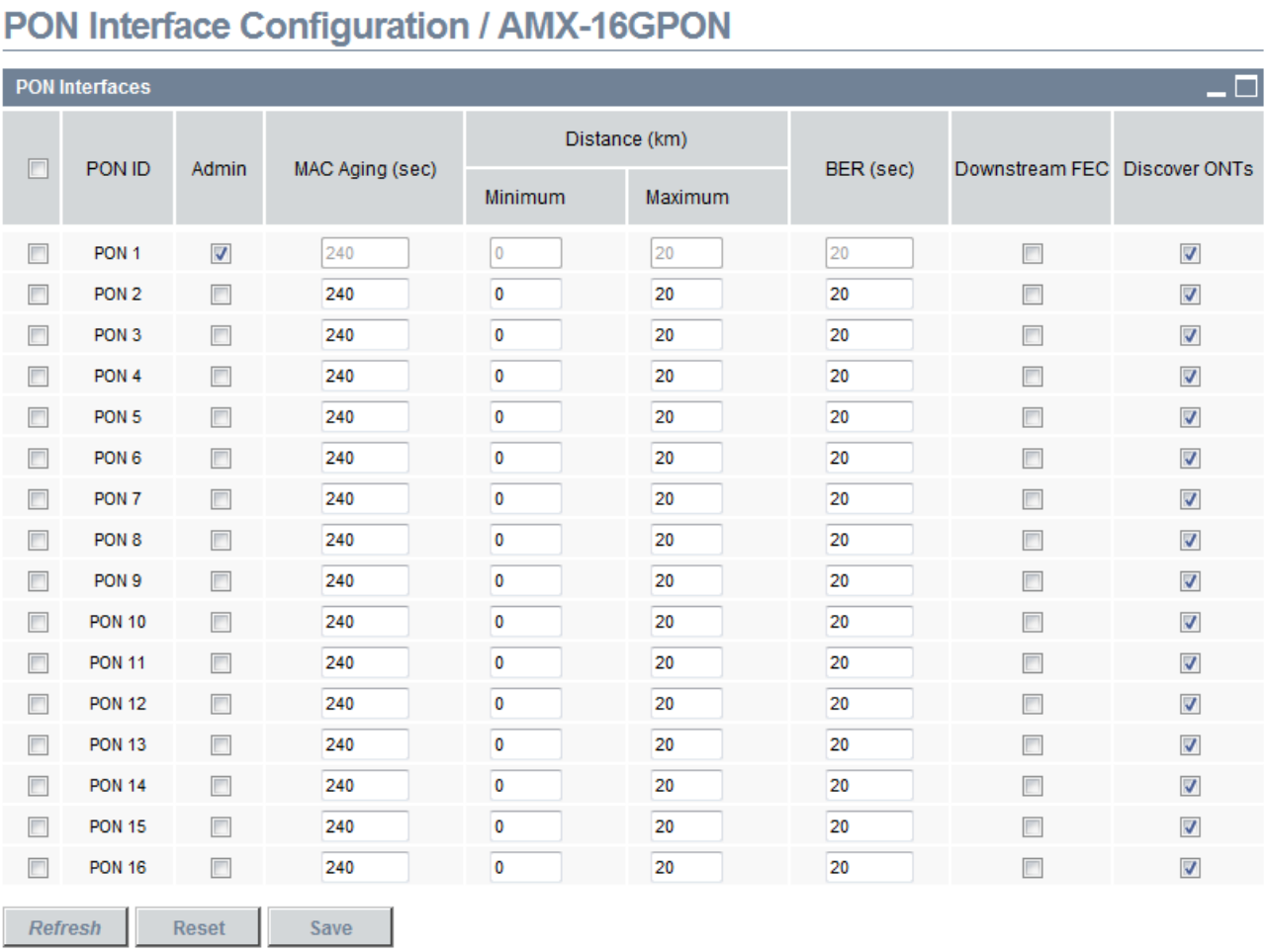


Table 40. GPON interfaces configuration parameters table

Parameter	Description
Port id	Port identifier
Admin	Port Administrative State
MAC Aging (sec)	Time it takes for a MAC address to be removed from the GPON MAC table, in the case it hasn't been received any packet with that source address in that GPON port. This value must be in the range between 120 and 3600 seconds. (Note: The MAC addresses in the GPON interface are only learnt in Unicast Unstacked Services)
Distance Minimum/Maximum	Sets the distance for which the interface can detect ONTs. The difference between the minimum and the maximum can't exceed 20km, and the maximum distance can't be higher than 60km.
BER(sec)	PON port Bit Error Rate in the downstream in sec
Downstream FEC	Flag; Downstream FEC enabled at this PON port if selected
Discover ONTs	Flag; Discover ONTs at this PON port enabled if selected

AMX-48GE -INTERFACES

The AMX-48GE Ethernet Interfaces Configuration widow is composed of two tables:

- Ethernet interfaces
- Client services.

In the Ethernet interfaces table it is possible to configure the module Ethernet interfaces.

In CLI, local modules Ethernet interfaces related commands including configuration are described in section ethernet" sub-node and sub-sections.

Figure 81. Ethernet interfaces configuration- AMX-48GE

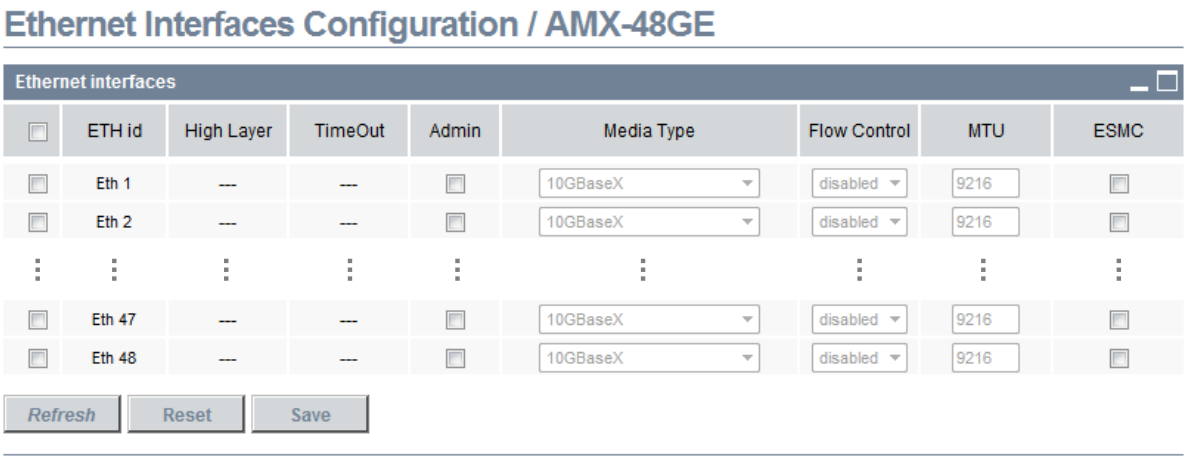


Table 41. Ethernet interface configuration parameters

Parameter	Description
ETH id	Port identifier
High Layer	In case the port belongs to a LAG, identifies to each LAG the port belongs to
Timeout	Indicates the timeout used by the LACPDU's packets (long=30s and short=1s)
Admin	Port Administrative State
Media Type	Link Speed and Duplex
Flow Control	Activates the transmission and processing of Pause Frames (always disabled)
MTU	Defines de maximum size of a packet that can be transferred in on frame over a network
ESMC	Ethernet Synchronization Messaging Channel: Enable/Disable

In the Client services table it is possible to configure the services associated to each interface

Figure 82 AMX-48GE Ethernet interfaces configuration window –Client Services table

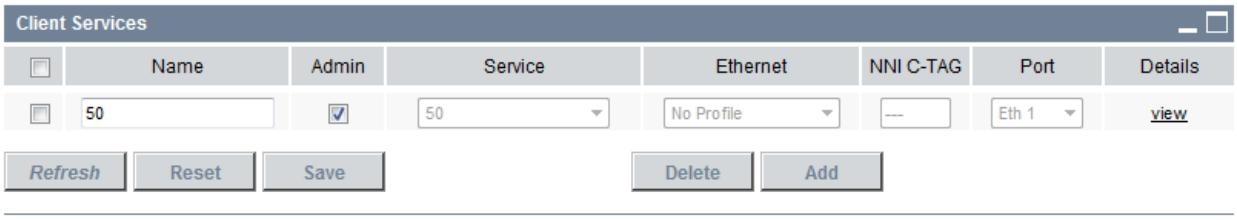


Table 42. Client Service table parameters

Parameter	Description
Name	Client Service Name
Admin	Client Service Administrative State
Service	Service Identifier
Ethernet	Choose an existing Ethernet profile by ID
NNI C-TAG	Inner VLAN ID (client) on the network-facing (Ethernet) interface. (1..4094)
Port	Interface Identifier
Details	Selecting view for a Client service in the list, a dialog box pops up, showing the details for the specified Client Service configuration and allowing to change it.

To add a new Client Service select the button "Add". The next window is shown, where it is possible to set the parameters for the Client Service configuration described in the table below. The number and type of options shown in the configuration dialog box depend on the configuratuion of the OLT services available to be selected at the Services combo box that vwere previously derfined at the configuration menu, sub-item Services. IGMP and DHCP options are shown only if the services slected were configured with the attributes.

Figure 83. Add Client Service dialog box

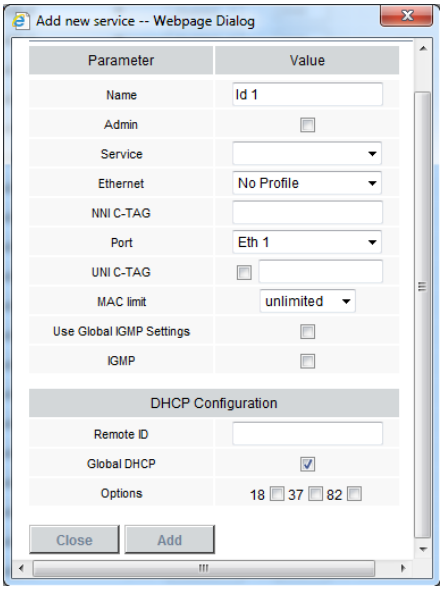


Table 43. Add Client service configuration parameters

Parameter	Description
Name	Client Service Name
Admin	Client Service Administrative State
Service	OLT Service Identifier
Ethernet	Ethernet profile ID
NNI C-TAG	Inner VLAN ID (client) on the network-facing (Ethernet) interface.
Port	Interface Identifier
UNI-C-TAG	VLAN ID delivered/received from the (Ethernet) subscriber-facing interface at the ONU.
MAC limit	Unlimited/limited to (numerical value)
Use Global IGMP Settings	Flag (enabled/disabled) If selected Global IGMP settings defined at the service creation (Configuration menu, Sevices item) will be used.
IGMP	Flag (enabled/disabled)
DHCP Configuration	Client Service DHCP configuration **Remote ID**: Remote ID field added to DHCP packets in DHCPop.82 enabled services. **Global DHCP:** Use DHCP options defined in the OLT global service. **Options**: DHCP options' flags 17/37/82

LAG INTERFACES

The LAG interfaces provide the system with Aggregation, Protection and Load Balancing of the uplink interfaces. It's possible to add/remove/configure.

In CLI local modules LAG interfaces related commands including configuration are described in "lag" sub-node and subsections

Figure 84. LAG interfaces configuration

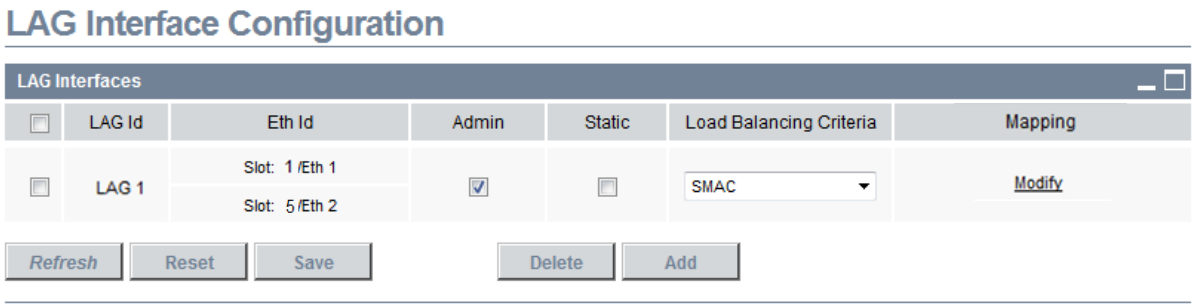


Table 44. LAG interfaces configuration parameters table

Parameter	Description
LAG Id	Lag interface identifier
Eth Id	Ethernet Interfaces associated with the LAG
Admin	Port Administrative State
Static	Indicates if the LAG is Static (doesn't transmit nor process LACPDU packets) or dynamic (transmits and processes LACPDU packets)
Load Balancing	Traffic Load Balancing of the LAG interface, there are three options:

Criteria	**SMAC:** Source MAC **DMAC:** Destination MAC **SMAC&DMAC:** Source and Destination MAC
Mapping	Allows changing the LAG interface ports association by selecting Modify link. This link opens a Mapping dialog box in order to do LAG configuration, Figure 84

By pressing the "Add" button, it will be added a new line with the first LAG id available.

In order to associate the ports to the LAG the Modify link under Mapping Column must be selected, and then it will appear the Mapping dialog box in order to do LAG configuration, Figure 85

Figure 85. LAG Mapping Dialog Box

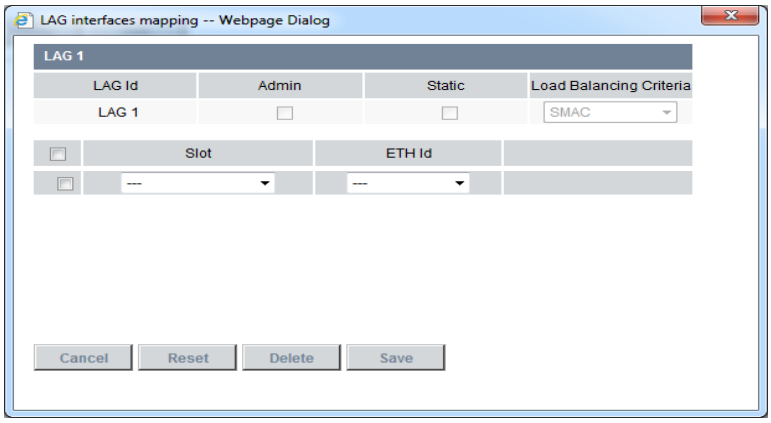


Table 45. Mapping LAG interfaces configuration parameters

Parameter	Description
Lag Id	Lag interface identifier
Eth Id	Ethernet Interfaces associated with the LAG
Admin	Port Administrative State
Static	Indicates if the LAG is Static (doesn't transmit nor process LACPDU packets) or dynamic (transmits and processes LACPDU packets)
Balance	Traffic Load Balancing of the LAG interface, there are three options: **SMAC:** Source MAC **DMAC:** Destination MAC **SMAC&DMAC:** Source and Destination MAC
Slot	Indicates the Slot/LC to which the ETH interface used in the LAG belongs to
ETH Id	Indicates th etherent interface used in the LAG

Services

The services window is used to configure general OLT services giving an end-to-end perspective by configuring the service VLAN in the uplink interface and the VLAN delivered in the ONU port. This window has two tables: Rate limiters configuration table and Services table, Figure 86.

In CLI, OLT services related commands including configuration are described in section “service” node and subsections.

Figure 86. OLT services configuration window

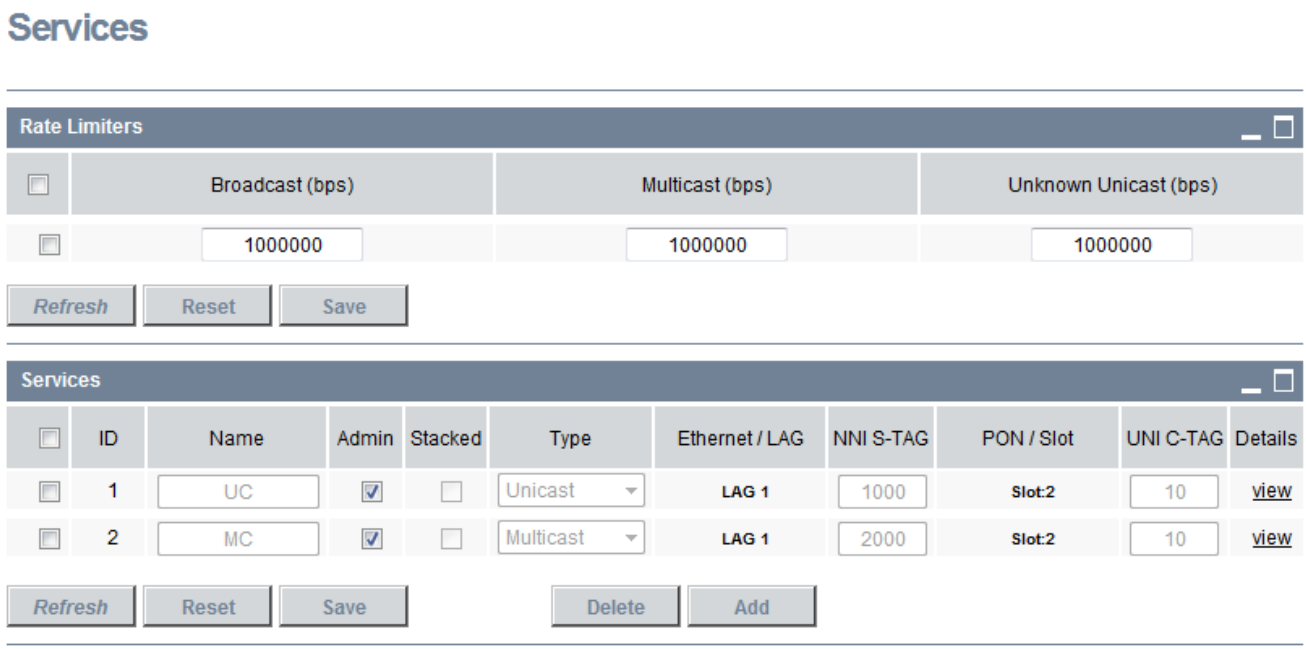


Table 46. Rate Limiters table Configuration parameters

Parameter	Description
Broadcast (bps)	Rate Limiter configured value for Broadcast services
Multicast (bps)	Rate Limiter configured value for Multicast services
Unknown Unicast (bps)	Rate Limiter configured value for Unknown Unicast services

Table 47. Services Configuration parameters

Parameter	Description
Name	Name that identifies the Service
Admin	Service Administrative State
Stacked	Provides the frame format in the uplink interface. If it’s Stacked the frame contains two vlan tags, if it’s Unstacked the frame contains only one vlan tag. Both vlans have Ethertype=0x8100.
Type	Identifies the type of service: **Unicast**: Bidirectional service, where each frame has only one final destination. These services are used in Residential applications, where some kinds of packets can be trapped and processed (ex. DHCP, IGMP). In case of Unstacked Services, MAC Learning is preformed. **Multicast**: Unidirectional Service, where one frame can be delivered to several destinations. These destinations are controlled by IGMP Snooping/Proxy.

	UniVoIP: Bidirectional Service, where each frame has only one final destination. Similar to Unicast Services, with the difference that when it's configured to the ONU, VoIP configurations are downloaded to the ONT. **Bitstream**: Bidirectional Service, where each frame has only one final destination. These services are used in Business applications, where all packets pass transparently by the system and MAC learning is disabled. **MAC Bridge**
Ethernet/LAG	Identifies the slot(s) of the uplink physical (ETH) or the logical (LAG) port
NNI S-TAG	Identifies the outer tag of the service used in the uplink port
PON/Slot	Identifies the slot of the GPON LC with port(s) associated to the Service
UNI C-TAG	Identifies the VLAN delivered/received to/from the ONU. After this VLAN can be translated in the ONU.
Details	By pressing view it will appear a window with the service configuration details where depending on the service it's possible to change some of the parameters, and the ports associated with the service.

Figure 87. Service Configuration details

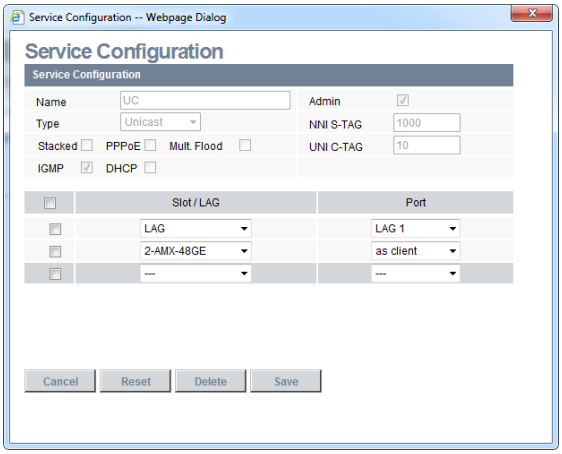


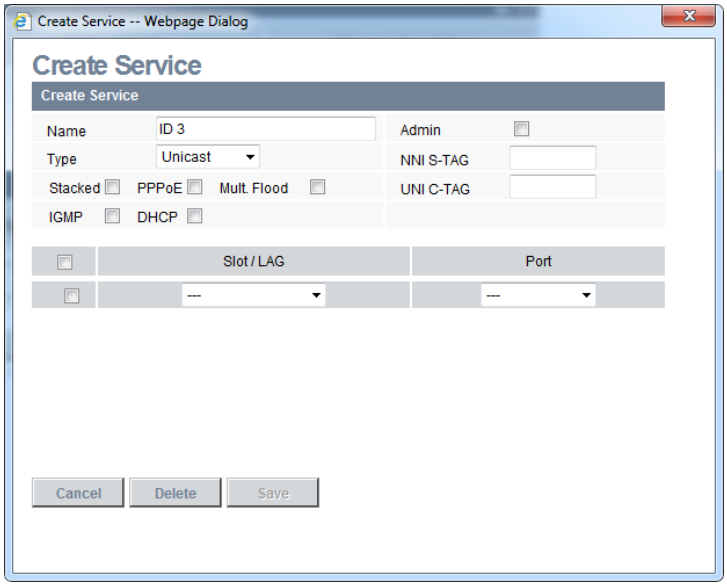
Table 48. Services Configuration details: parameters

Parameter	Description
Name	Name that identifies the Service
Type	Identifies the type of service: **Unicast**: Bidirectional service, where each frame has only one final destination. These services are used in Residential applications, where some kinds of packets can be trapped and processed (ex. DHCP, IGMP). In case of Unstacked Services, MAC Learning is performed. **Multicast**: Unidirectional Service, where one frame can be delivered to several destinations. These destinations are controlled by IGMP Snooping/Proxy. **UniVoIP**: Bidirectional Service, where each frame has only one final destination. Similar to Unicast Services, with the difference that when it's configured to the ONU, VoIP configurations are downloaded to the ONT. **Bitstream**: Bidirectional Service, where each frame has only one final destination. These services are used in Business applications, where all packets pass transparently by the system and MAC learning is disabled.

	MAC Bridge
Stacked	Provides the frame format in the uplink interface. If it's Stacked the frame contains two vlan tags, if it's Unstacked the frame contains only one vlan tag. Both vlans have Ethertype=0x8100.
PPPoE	Enable or disable PPPoE for a given service. (enable|disable)
Mult. Flood	Multicast flooding. (enable|disable)
IGMP	Enable or disable IGMP for a given service. (enable|disable)
DHCP	Identifies if the service must work has a DHCP Relay Agent.
Admin	Service Administrative State
NNI S-TAG	Identifies the outer tag of the service on the network-facing (Ethernet) interface in the uplink port (1..4094)
UNI C-TAG	Identifies the VLAN delivered/received to/from the (Ethernet) subscriber-facing interface at the ONU. (1..4094) After this VLAN can be translated in the ONU.
Slot/LAG	Slot of the LC to which the used port belongs to
Port	Port, belonging to the line card in a given slot position, used for the service configuration

New services can be added through the "Add" button, Figure 88. For service configuration parameters description refer to Table 48.

Figure 88. Create Service Configuration Dialog Box



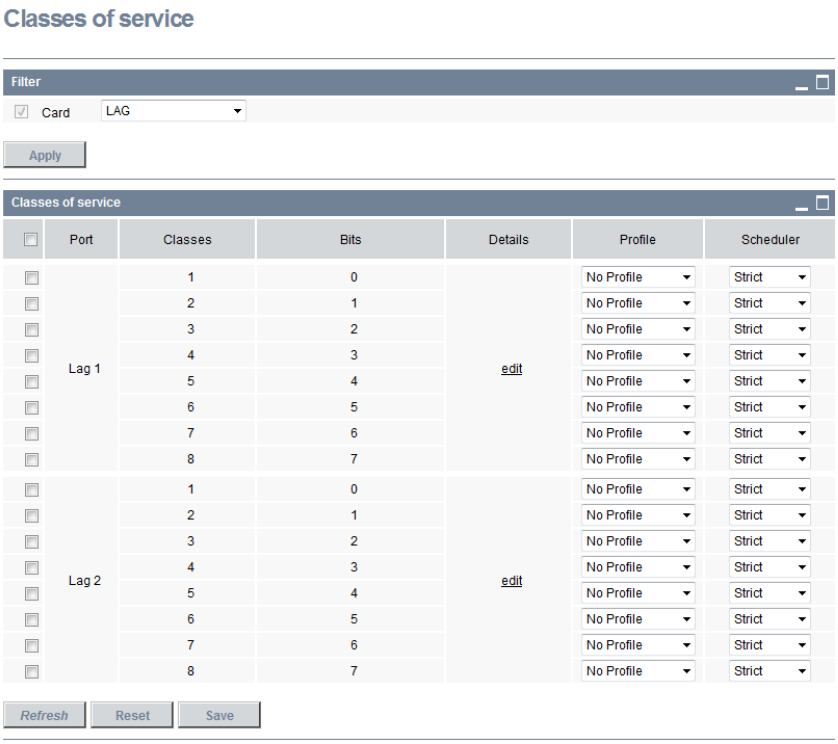
CLASSES OF SERVICE

For each OLT physical or logical ports are associated eight queues, for each of these queues it is possible to configure the p-bits, the scheduler type (SP or WFQ) and the bandwidth profile associated to each.

In CLI, classes of services related commands including configuration are described in section ethernet" sub-node, subsection "cos" sub-node , section "lag" sub-node

"cos" sub-node and section"gpon" sub-node subsection "cos" sub-node.

Figure 89. Classes of service

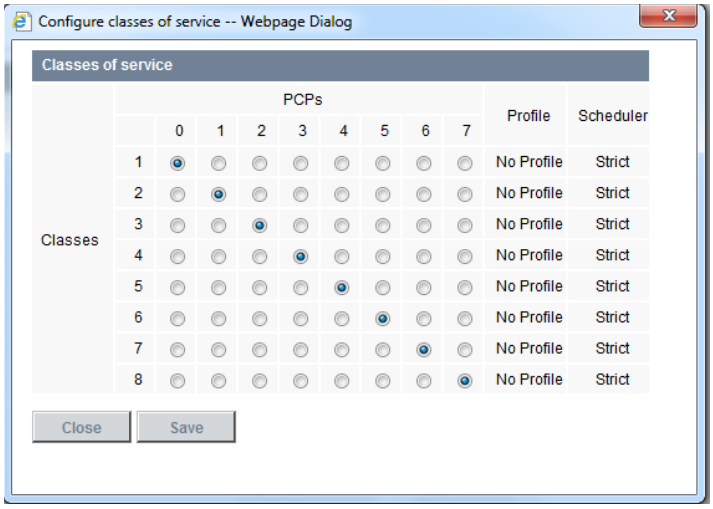


Due to the large number of ports that can be available in OLT platform, there is a filter where the user can select the port/card to configure.

Table 49. Classes of Service configuration parameters table

Parameter	Description
Port	Identifies the port
Classes	Identifies each of the 8 classes of the port
Bits	Identifies the p-bits associated to the Class of Service
Details	By pressing edit, the dialog box in Figure 90 will open, and it's possible to configure the p-bit to class mapping
Profile	Identifies the Bandwidth profile used by the Class. It's possible to have "No Profile".
Scheduler	Identifies the type of Scheduler used by the Class. It can be Strict Priority or Weighted Fair Queuing

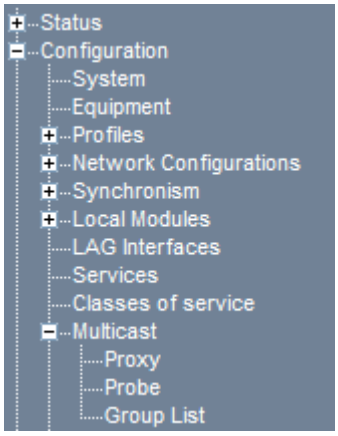
Figure 90. PCP/Class Mapping



MULTICAST

Multicast configuration sub-menu is composed of three configuration items, proxy, probe and group list items, Figure 91.

Figure 91. Multicast Configuration sub- menu



MULTICAST::PROXY

The multicast configuration sub-menu, Proxy item selection opens a configuration window composed of two tables, Figure 92:

- IGMP Proxy configuration table
- Querier configuration table

In CLI, multicast related commands including conmfiguration are described in section “multicast” node and subsections.

Figure 92. Multicast Window IGMP Proxy and Querier configuration tables

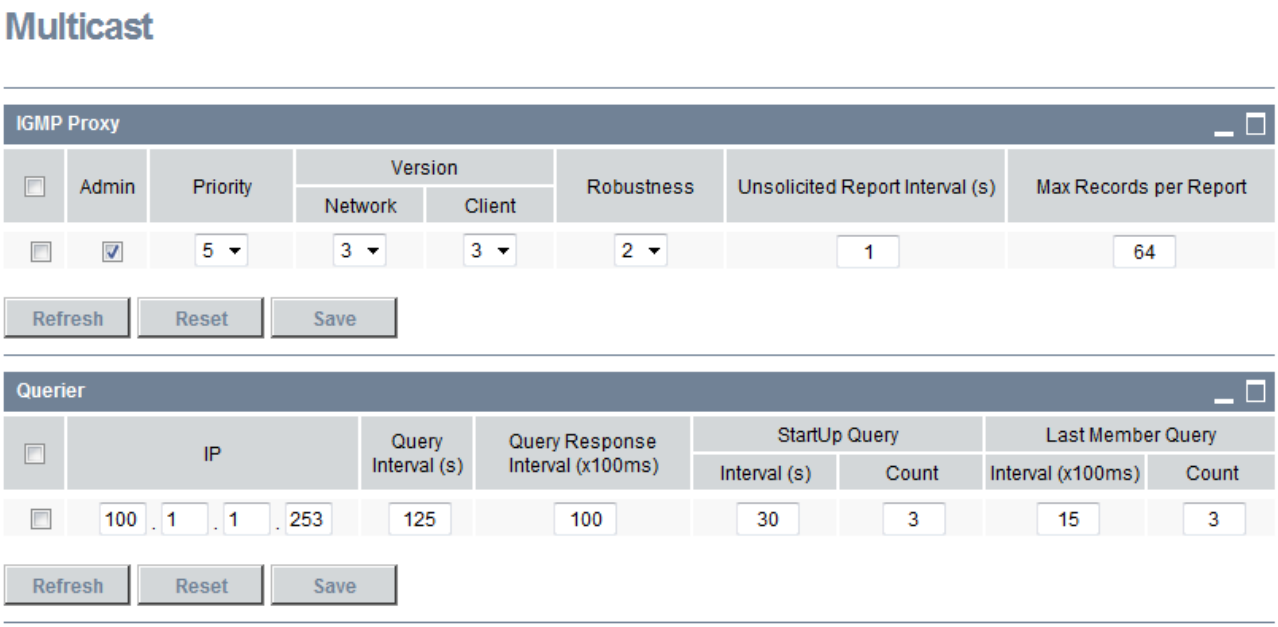


Table 50. IGMP proxy configuration parameters

Parameter	Description
Admin	IGMP Proxy Administrative State
Priority	pbit value in the IGMP packets (0<=n<=7)
Proxy	Proxy IP address used by the IGMP packets generated by the OLT
Version	**Network**: IGMP version used in the Network interfaces **Client:** IGMP version used in the client interfaces
Robustness	Specifies the number of retransmissions sent. Should be adjusted for the expected packet loss on the network.
Unsolicited Report Interval	Time interval between repetitions of a host's initial group membership report.
Max Records per Report	Maximum number of group-records that can be included in the same membership report.

Table 51. Querier configuration parameters

Parameter	Description
IP	IP Address
Query Interval	Time Interval (in seconds) between the transmissions of each General Querier to the clients. The value must be in the range 30 to 1800.
Query Response Interval	Interval between retransmissions of general queries sent to the clients.
Startup Query	**Interval:** Interval between retransmissions of general queries sent by the proxy on startup. **Count:** Number of general queries sent by the proxy on startup.sent. Should be

	adjusted for the expected packet loss on the network.
Last Member Query	**interval**: Max Response Time used to calculate the Max Resp Code inserted into Group-Specific queries sent in response to Leave Group messages **Count**: Number of Group-Specific Queries sent before the router assumes there are no local members.

MULTICAST::PROBE

The multicast configuration sub-menu, Probe item selection opens an Active Channels configuration window, Figure 93:

The Active Channels Probes Window provides a way to check which Multicast Channels have been asked by the IGMP protocol (Control Plane). To check if the Data packets (Data Plane) are arriving to the OLT, the user can activate the Active Channels Probes.

In CLI, Multicast Probes related commands including configuration are described in section "probes" sub-node and subsections.

Figure 93. Active channels Probes Configuration window

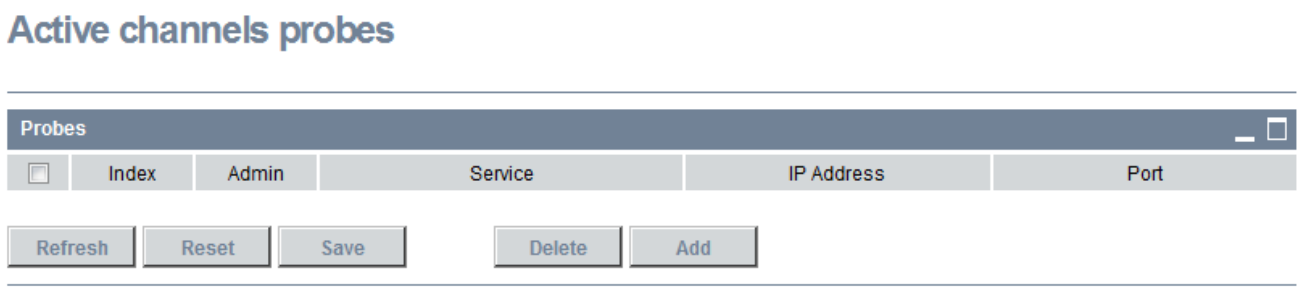
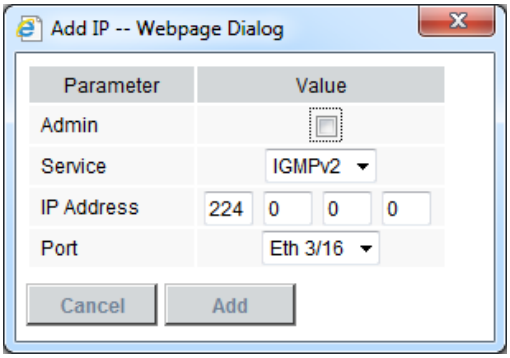


Table 52. Active Channels Probes Configuration parameters

Parameter	Description
Index	Index of the Probe
Admin	Probe Administrative State
Service	Service to which the probe applies to
IP Address	Muticast IP address of the Service the probe applies to
Port	Port where is the service to which the probe applies to

The "Add" button opens a configuration window to set the parameters for a new Active channels probe, Figure 95.

Figure 94. Add Active Channels Probe Dialog Box



MULTICAST::GROUP LIST

The multicast configuration sub-menu Groups item selection opens a Group List configuration window, Figure 95:

Active Channels window allows to configure/add/remove Multicast Groups.

In CLI, Multicast Group List related commands including configuration are described in section “group-list” sub-node and subsections.

Figure 95. Group List Configuration window

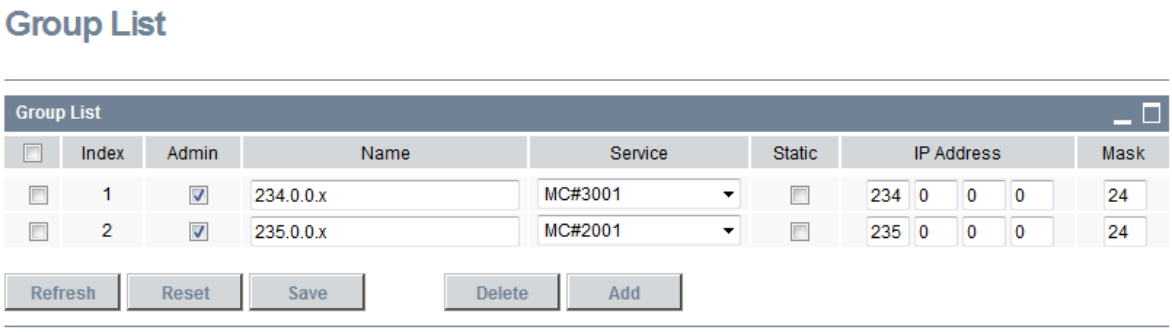


Table 53. Group List Configuration parameters

Parameter	Description
Index	Index of the Active Group
Admin	Active Group Administrative State
Name	Active Group Name
Service	Service to which the Active Group belongs to
Static	Static Active Group Flag (enable/disable)
IP Address	Active Group IP address
Mask	Active Group Mask

MAC TABLE ::SWITCH

In configuration sub-menu MAC, the Switch menu item opens Aging Time Configuration window, Figure 96. In this window it is possible to configure the Aging Time which defines the maximum time each MAC address can be at the MAC table when no packet with that MAC address arrives to the system.

In CLI MAC table switch related commands are described in section “mac-table” node and subsections.

Figure 96. Aging Time Configuration window

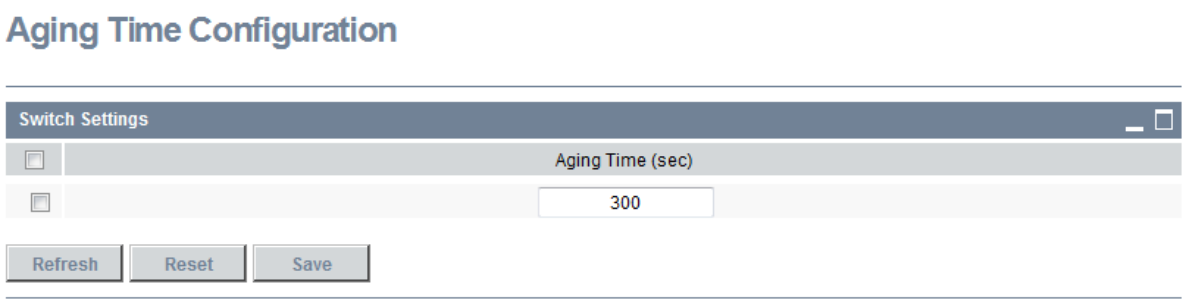


Table 54. Switch Settings configuration parameters table

Parameter	Description
Aging Time (sec)	Maximum time each MAC address can be at the MAC table when no packet with that MAC address arrives to the system (10…1000000)

DHCP

DHCP configuration has two configuration tables, one for the Global DHCP Configuration and another for DHCP configuration by service, allowing the setting of DHCP options by service, Figure 97.

In CLI DHCP related commands including configuration are described in section “dhcp” node and subsections.

Figure 97. DHCP Configuration Window

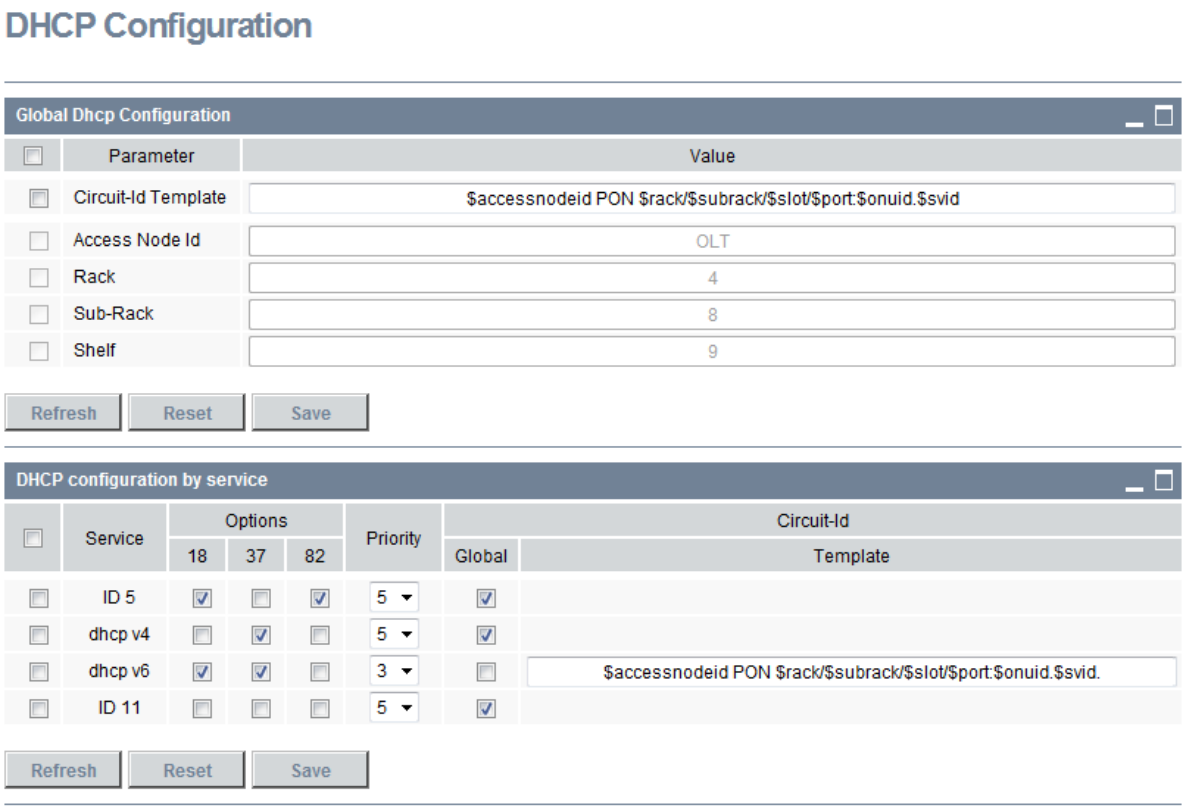


Table 55. Global DHCP configuration parameters

Parameter	Description
Circuit-Id Template	The Syntax for the circuit ID template string is the following: $accessnodeid PON $rack/$subrack/$slot/$port:$onuid.$svid Template circuit ID parameters, variables and usable values are listed in Table 57
Access Node Id	Display the access node identification
Rack/sub-Rack/Shelf	Numeric coordinates of the equipment cabinet position

Table 56. DHCP configuration by service parameters

Parameter	Description
Service	Choose an OLT service by ID.
Options	18/37/82 – Enables the DHCP options in the service
Priority	pbit value in the DHCP packets (0<=n<=7)
Circuit Id	**Global:** if Enabled the Circuit-Id configure in the Global DHCP configuration window is used. **Template:** Circuit-Id template to use for the service if Global Disabled.

Table 57. Template circuit ID syntax

Parameter	Variable	Value
Access Node	$accessnodeid	String(63)
Rack	$rack	0..99
Sub-Rack	$subrack	0..99
Shelf	$shelf	0..99
Ethernet Priority	$ethprty	0..7
Shelf	$shelf	0..99
Ethernet Priority	$ethprty	0..7
ONU ID	$onuid	0..999
Slot	$slot	0..99
Port	$port	0..99
Q-VLAN ID	$qvid	0..4095
S-VLAN ID	$svid	0..4095
C-VLAN ID	$cvid	0..4095

IP SOURCE GUARD

The configuration menu item IP Source Guard opens an IP source Guard Configuration window, Figure 98. In this window it is possible to configure the IP source Guard Filters on Layer 2 Ports.

Figure 98. IP source Guard Configuration window

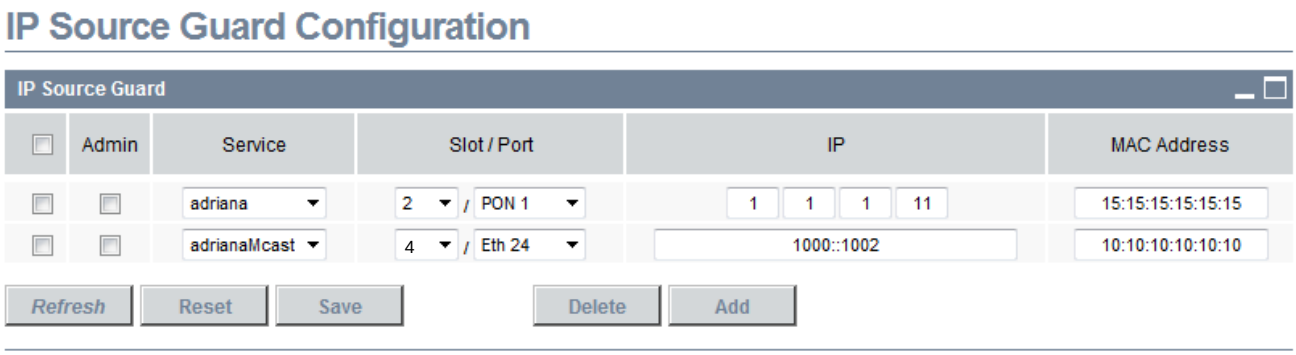


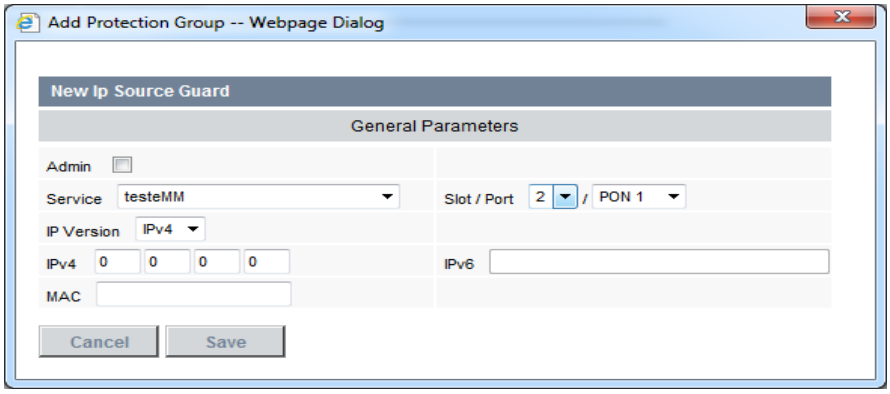
Table 58. IP Source Guard configuration parameters table

Parameter	Description
Admin	IPsource Guard Filter administrative state
Service	Service to which the iP Source guard Filter applies, selectable froma

	comobo box with all previously configured available services.
Slot/Port	Port to which the filter applies identified by the pair slot (where the LC is inserted)/physical port
IP	IPv4/IPv6 address
MAC Address	MAC address

The Add button opens a IP Source Guard configuration dialog box allowing the configuration of a new IP source guard Filter, Figure 99.

Figure 99. Add IP source Guard Configuration ~Dialog box



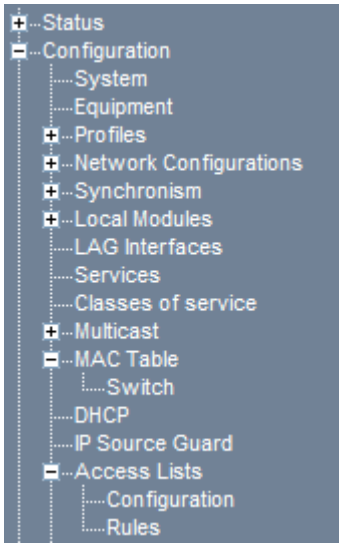
ACCESS LISTS

The Access Lists configuration sub-menu has two items, Figure 100:

- Configuration
- Rules

In CLI ACL related commands including configuration are described in section “acl” node and subsections.

Figure 100: Access Lists configuration sub-menu



ACCESS LISTS::CONFIGURATION

The selection of Access Lists Sub-menu item Configuration opens an Access Control List window, Figure 101. In this window it is possible to create access control lists, configure port associations and services associations per access list.

Figure 101. Access Control List configuration window

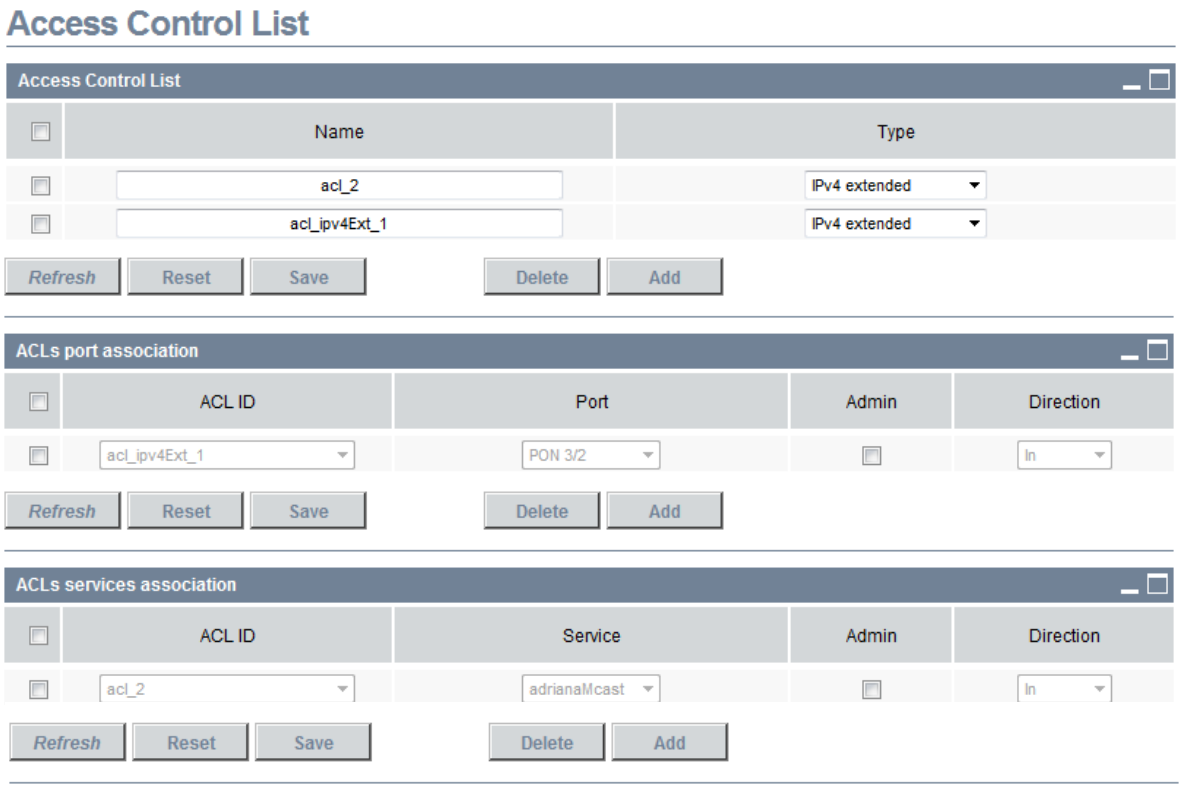


Table 59. Access Control List Table parameters

Parameter	Description
Name	Access list name
Type	Access list type: • **MAC,** • **IPv4 Standard** • **IPv4 Extended** • **IPv6 Extended**

To create a new access list the Add button should be used. A new line will be added to the access control list table. The name of the list (text string)should be typed in in the Name field and the access list type selected from the Type combo box. The button Save will save the configuration done.

Table 60. ACLs port association table parameters

Parameter	Description
ACL ID	Access List name
Port	Port associated to the access control list, identified by the pair (Port type and #/slot #)
Admin	Administrative status of the ACL sport association table entry
Direction	Traffic direction on the ACLs list associated port (current value –in)

To configure ACLs port association the button Add should be used. An ACls port association dialog box will open allowing the configuration of ports to the selected ACL list, Figure 102. The use of Dialog Box Add button will add the configured ACLs port association to the ACLs port association table. The Save button will save the change to the ACLs port association table.

Figure 102: ACLs port association configuration dialog box

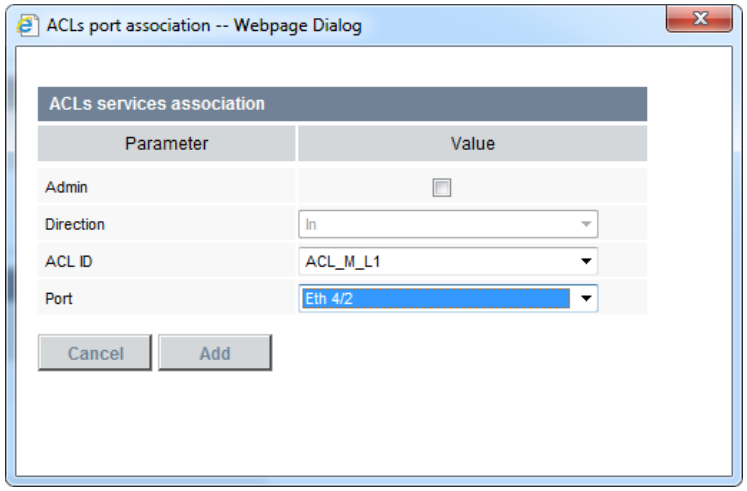
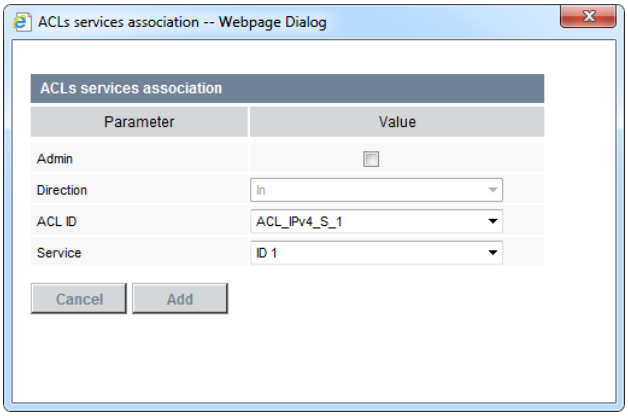


Table 61. ACLs service association table parameters

Parameter	Description
ACL ID	Access List name
Service	Service associated to the access control list, identified by Service Name
Admin	Administrative status of the ACL service association table entry
Direction	Traffic direction for the ACLs list associated service (current value –in)

To configure ACLs service association the button Add should be used. An ACls port association dialog box will open allowing the configuration of service to the selected ACL list, Figure 103. The use of Dialog Box Add button will add the configured ACLs services association to the ACLs services association table. The Save button will save the change to the ACLs services association table.

Figure 103: ACLs service association configuration dialog box



ACCESS LISTS::RULES

The selection of Access Lists Sub-menu item Rules opens an Access Control List rule Configuration window, Figure 107. In this window it is possible to create rules for the existing access control lists. There is a rules' table for each type of access control list: MAC, IPv4 Standard, IPv4 Extended and IPv6 Extended.

Figure 104. Access Control List Rule Configuration window

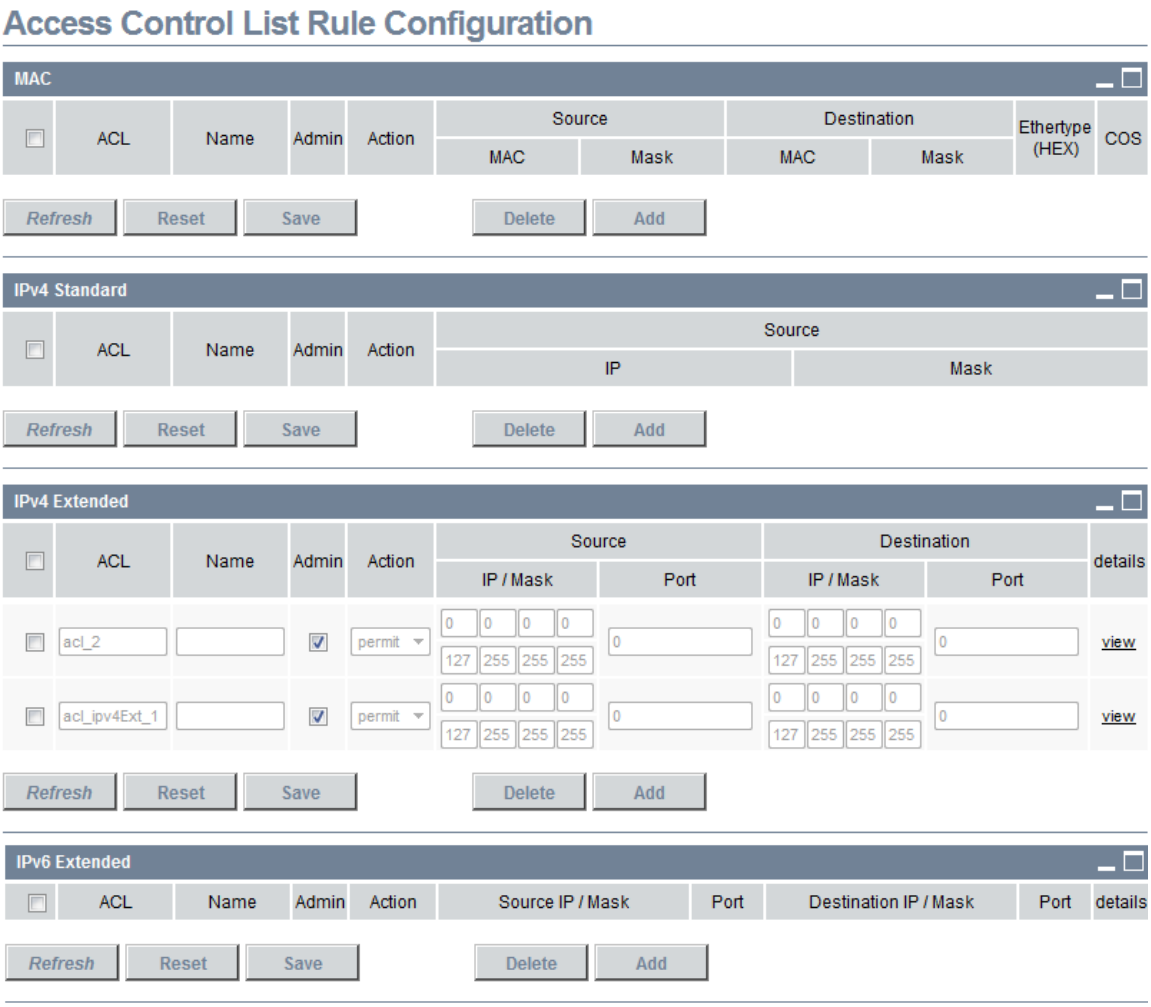


Table 62. Access Control List Rules – MAC Table parameters

Parameter	Description
ACL	Access control list name
Name	ACL Rule name
Admin	Administrative status of the ACL Rule table entry
Action	Action that the rule will implementon the specified traffic • Deny, • Permit.
Source	Source Address of the traffic subject to the configured ACL Rule: • MAC • Mask.
Destination	Destination Address for the traffic subject to the configured ACL Rule: • MAC, • Mask.
EtherType	Ethertype specifying the type of traffic subject to the configured ACL Rule

(Hex)	
COS	CoS of traffic subject to the configured ACL Rule

Table 63. Access Control List Rules – IPv4 Standard Table parameters

Parameter	Description
ACL	Access control list name
Name	ACL Rule name
Admin	Administrative status of the ACL Rule table entry
Action	Action that the rule will implementon the specified traffic • Deny, • Permit.
Source	Source Address of the traffic subject to the configured ACL Rule: • IP – IPv4 Source address • Mask- IPv4 Source Mask
Destination	Destination Address for the traffic subject to the configured ACL Rule: • IP – IPv4 Destination address • Mask - IPv4 Destination mask

Table 64. Access Control List Rules – IPv4 Extended Table parameters

Parameter	Description
ACL	Access control list name
Name	ACL Rule name
Admin	Administrative status of the ACL Rule table entry
Action	Action that the rule will implementon the specified traffic • Deny, • Permit.
Source	Source Address of the traffic subject to the configured ACL Rule: • IP/Mask– IPv4 Source address and mask • Port – Traffic source port
Destination	Destination Address for the traffic subject to the configured ACL Rule: • IP/Mask – IPv4 Destination address and mask • Port- Traffic destination port
Details	Selecting the link view a dialog box with the details for the respective ACL rule will open, Figure 105. This box allows the definition of the ethernet frame fields of the traffic subject to the rule, Table 66

Table 65. Access Control List Rules – IPv6 Extended Table parameters

Parameter	Description
ACL	Access control list name
Name	ACL Rule name
Admin	Administrative status of the ACL Rule table entry
Action	Action that the rule will implementon the specified traffic • Deny, • Permit.

Source	Source Address of the traffic subject to the configured ACL Rule: • IP/Mask– IPv6 Source address and mask • Port – Traffic source port
Destination	Destination Address for the traffic subject to the configured ACL Rule: • IP/Mask – IPv6 Destination address and mask • Port- Traffic destination port
Details	Selecting the link view a dialog box with the details for the respective ACL rule will open. This box allows the definition of the ethernet frame fields of the traffic subject to the rule.

Figure 105: ACL rule Details dialog box

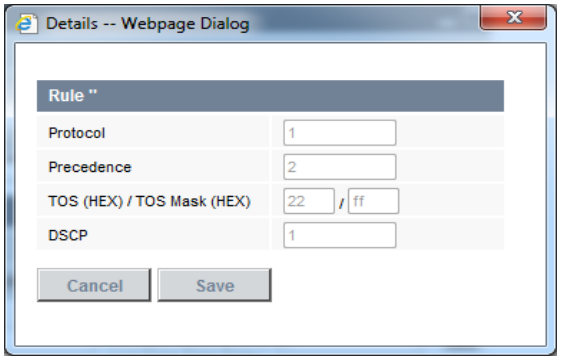


Table 66. ACL IPv4 Extended Details Table parameters

Parameter	Description
Rule “	ACL Rule Name
Protocol	Protocol of the traffic subject to the Rule
Precedence	Precedence of the traffic subject to the Rule
TOS(HEX)/TOS Mask (HEX)	TOS(HEX)/TOS Mask (HEX) of the traffic subject to the Rule
DSCP	DSCP of the traffic subject to the Rule

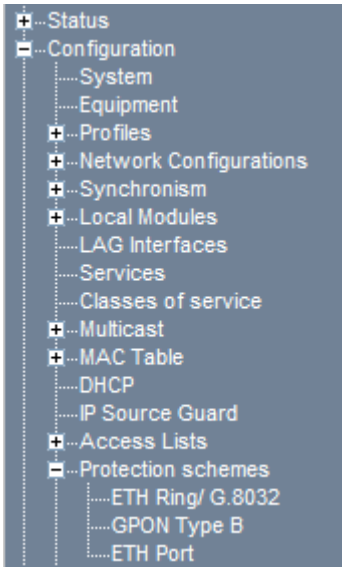
To create a new access list the Add button should be used. A new line will be added to the access control list table. The name of the list (text string)should be typed in in the Name field and the access list type selected from the Type combo box. The button Save will save the configuration done.

PROTECTION SCHEMES

The Protection Schemes configuration sub-menu has three items, Figure 106 :

- ETH Ring/G.8032
- GPON Type B
- ETH Port

Figure 106. Protection Schemes configuration sub-menu



PROTECTION SCHEMES:: ETHRING/G.8032

The selection of Protection Schemes Sub-menu item ETH Ring/G.8032 opens an Ethernet Ring Protection – G.8032 window, Figure 107.

Figure 107. Ethernet Ring Protection configuration window

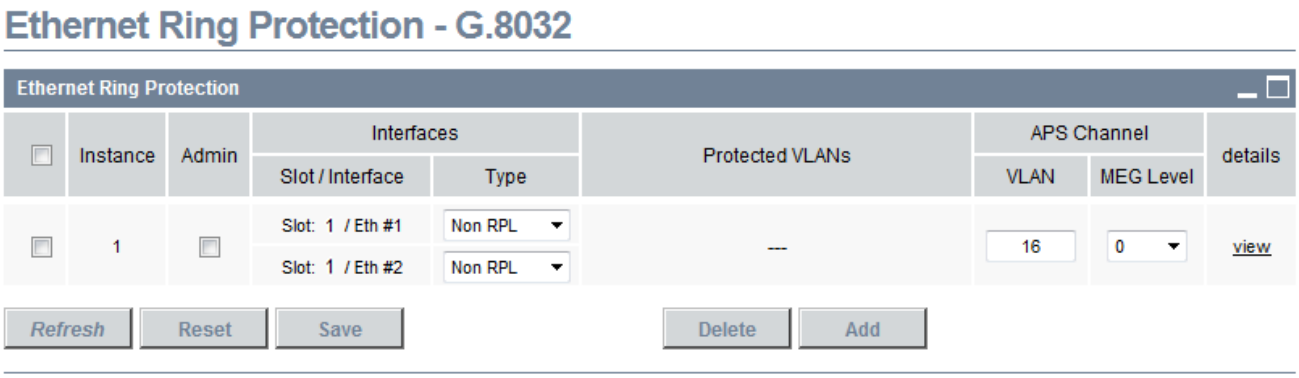


Table 67. Ethernet Ring Protection window parameters

Parameter	Description
Instance	ERP Instance Number
Admin	ERP administrative state
Interfaces	**Slot/Interface:** Interfaces of the ERP, identified by pair Slot/interface in the slot **Type:** ERP interface classification (RPL/Non RPL/RPL Neighbor)
Protected VLANs	Protected VLAN Identifier
APS Channel	**VLAN**:VLAN used by the Automatic Protection Switch Channel

	MEG Level: Maintenance Entity Group OAM level, from 0-7 (Operator (0, 1, 2)/Provider (3, 4)/Customer (5, 6, 7))
Details	By pressing view it will appear a window with the ERP Instance configuration details, Figure 108

Figure 108. ERP Instance Configutarion details Dialog Box

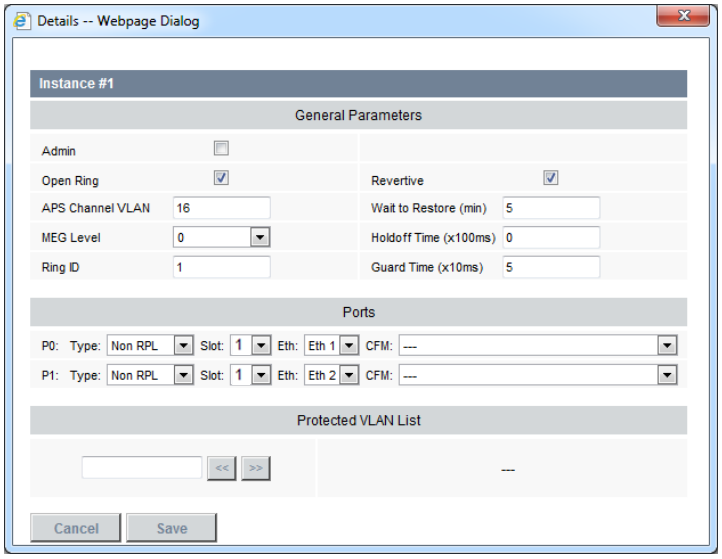


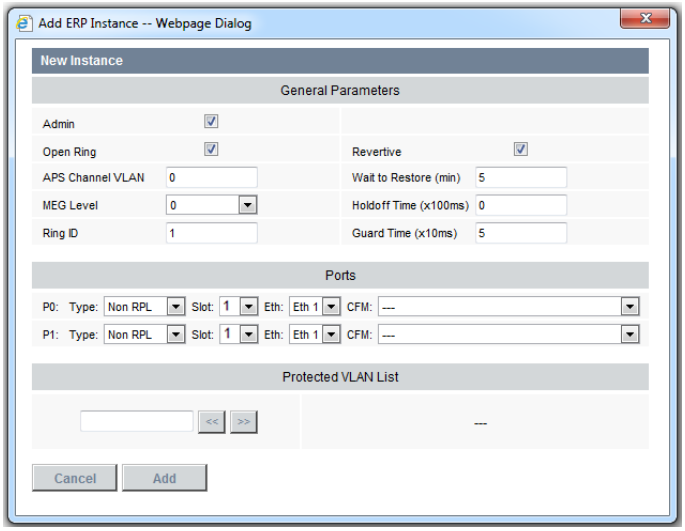
Table 68. ERP Instance Configutarion details Dialog Box parameters

Parameter Type	Parameter	Description
General parameters	**Admin**	ERP administrative state
	Open Ring	Open Ring Flag (enable/disable)
	APS Channel VLAN	VLAN used by the Automatic Protection Switch Channel
	MEG Level	Maintenance Entity Group OAM level, from 0-7 (Operator (0, 1, 2)/Provider (3, 4)/Customer (5, 6, 7))
	Ring Id	ERP instance Id
	Revertive	Revertive flag (enable/disable)
	Wait to Restore (min)	1 to 12 min, default value -5min
	Holdoff Time (x100ms)	1 to 10secs, default value- 0secs
	Guard Time (x10ms)	10ms to 2secs, default value 500ms
Ports	**P0/P1**	**Type:** ERP interface classification (RPL/Non RPL/RPL Neighbor) **Slot:** Slot to which the interfaces of the ERP belongs **Eth:** Interface identifier in the slot

		CFM: Connectivity Fault Management
Protected VLAN List	**Protected VLANs**	Protected VLAN Identifier

The “Add” button allows the configuration of a new ERP Instance, by opening a configuration Dialog Box, Figure 109. Refer to Table 68 for the description of the configuration parameters

Figure 109. Add ERP Instance Dialog box configuration parameters



PROTECTION SCHEMES:: GPON TYPE B

The selection of Protection Schemes Sub-menu item GPON Type B opens a GPON Type B window, Figure 116.

Figure 110. GPON Type B Protection configuration window

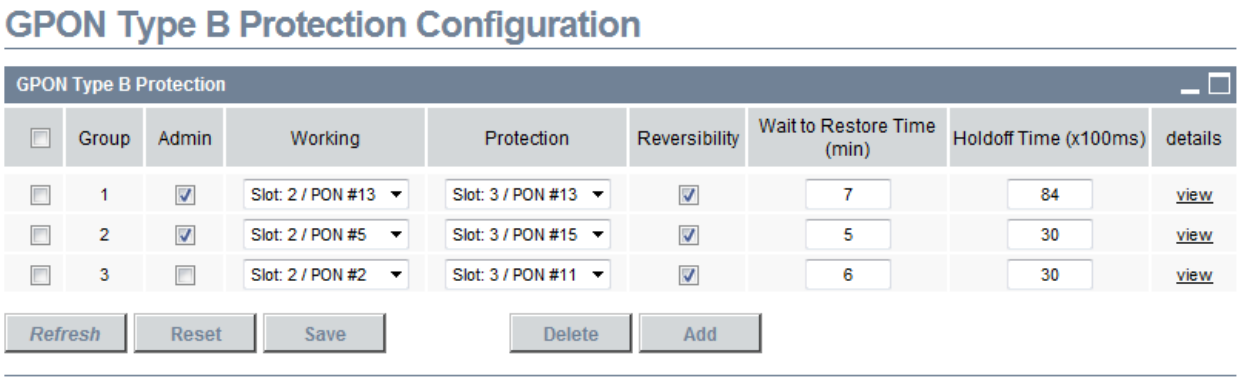


Table 69. GPON Type B Protection window parameters

Parameter	Description
Group	GPON Type B Protection group identifier
Admin	GPON Type B Protection group administrative state
Working	GPON Type B working interface, identified by pair Slot/interface in the slot
Protection	GPON Type B protection interface, identified by pair Slot/interface in the slot
Reversibility	Flag. If selected indicates that the system will switch back to the working interface after a predefined period of time on the protection state following a switch over
Wait to restore time (Min)	Time, in minutes, on the protection state after a switch over, before switching back to the working state, in the case Reversibility is configured..
Holdoff time (x100ms)	Time, in multiples of 100ms, after an alarm occurs, on the working state before switching over to the protection state.
Details	By pressing view it will appear a window with the GPON Type B Instance configuration details, Figure 111

Figure 111. GPON Type B protection Configuration details Dialog Box

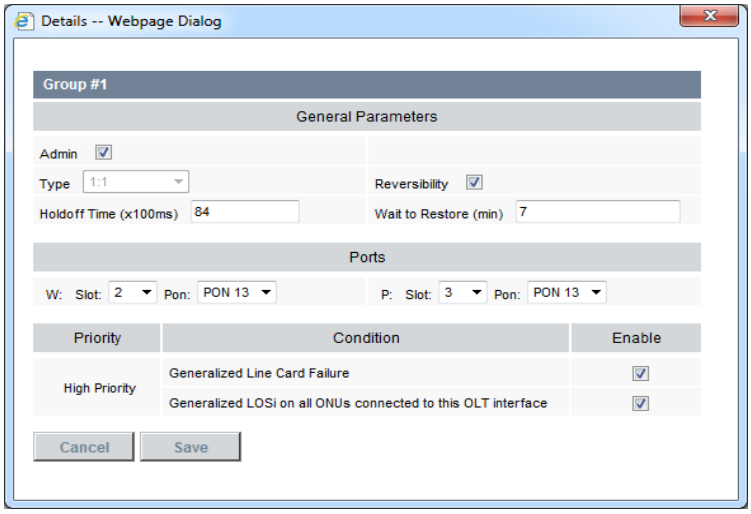


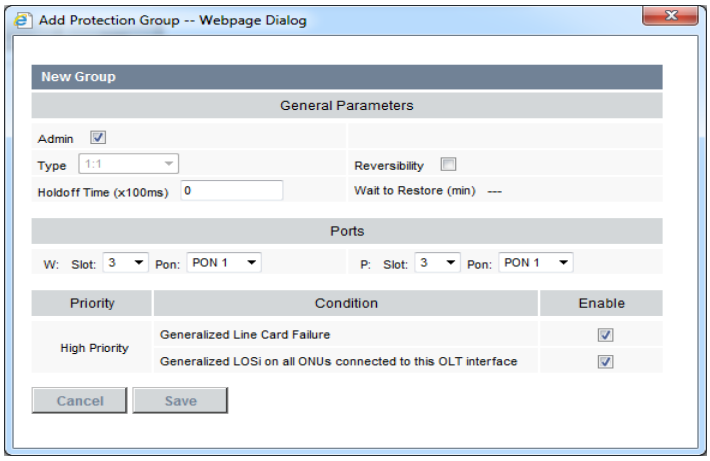
Table 70. GPON type B protection Group # details Dialog Box parameters

Parameter Type	Parameter	Description
General parameters	**Admin**	GPON Type B protection Group # administrative state
	Type	Type GPON Type B protection configured (current type- 1:1 protection)
	Reversibility	Flag. If selected indicates that the system will switch back to the working interface after a predefined period of time on the protection state following a switch over
	Holdoff time (x100ms)	Time, in multiples of 100ms, after an alarm occurs, on the working state before switching over to the protection state.

	Wait to restore time (Min)	Time, in minutes, on the protection state after a switch over, before switching back to the working state, in the case Reversibility is configured..
Ports	**W: Slot/Pon**	Group Working PON port identified by the pair Slot#/PON#
	P: Slot/Pon	Group Protection PON port identified by the pair Slot#/PON#
Priority: Switch over conditions' priority level classification	**Condition**	Type of conditions slectable for switch over cause; currently two high priority conditions can be configured to cause switch over to a protection state • **Generalized Line Card Failure** • **Generalized LOSi on all ONUs connected to this ONU interface**
	Enable	Flag; if selected enables the condition it refers to to be used as as switch over cause.

The "Add" button allows the configuration of a new GPON type B protection group, by opening a configuration Dialog Box, Figure 112. Refer to Table 70 for the description of the configuration parameters

Figure 112. Add GPON type B protection Group# Dialog box configuration parameters



PROTECTION SCHEMES:: ETH PORT

The selection of Protection Schemes Sub-menu item ETH Port opens an Ethernet Protection Configuration window, Figure 113.

Figure 113. Ethernet Protection configuration window

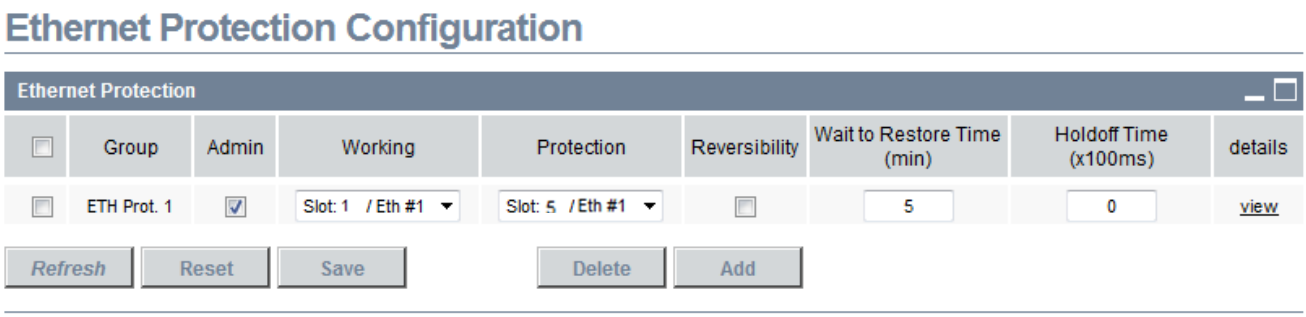


Table 71. Ethernet Protection window parameters

Parameter	Description
Group	Ethernet Protection group identifier
Admin	Ethernet Protection group administrative state
Working	Ethernet working interface, identified by pair Slot/interface in the slot
Protection	Ethernet protection interface, identified by pair Slot/interface in the slot
Reversibility	Flag. If selected indicates that the system will switch back to the working interface after a predefined period of time on the protection state following a switch over
Wait to restore time (Min)	Time, in minutes, on the protection state after a switch over, before switching back to the working state, in the case Reversibility is configured..
Holdoff time (x100ms)	Time, in multiples of 100ms, after an alarm occurs, on the working state before switching over to the protection state.
Details	By pressing view it will appear a window with the Ethernet Protection Group configuration details, Figure 111

Figure 114. Ethernet protection Group# Configuration details Dialog Box

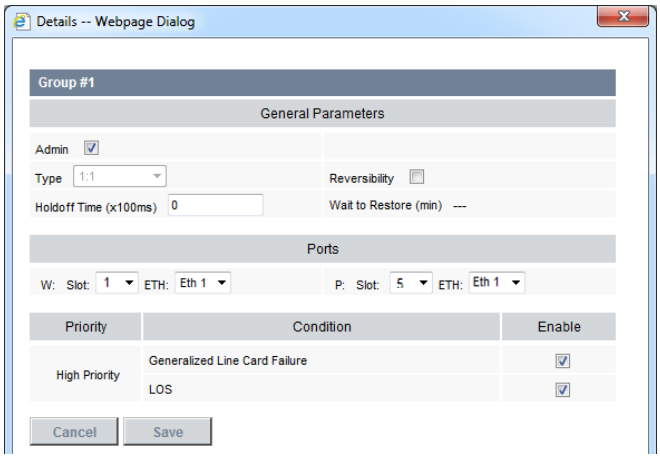
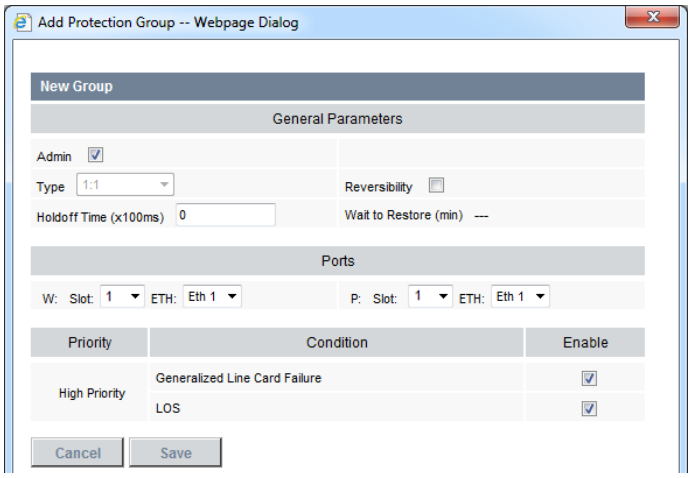


Table 72. Ethernet protection Group # details Dialog Box parameters

Parameter Type	Parameter	Description
General parameters	**Admin**	Ethernet protection Group # administrative state
	Type	Type Ethernet protection configured (current type- 1:1 protection)
	Reversibility	Flag. If selected indicates that the system will switch back to the working interface after a predefined period of time on the protection state following a switch over
	Holdoff time (x100ms)	Time, in multiples of 100ms, after an alarm occurs, on the working state before switching over to the protection state.
	Wait to restore time (Min)	Time, in minutes, on the protection state after a switch over, before switching back to the working state, in the case Reversibility is configured..
Ports	**W: Slot/Pon**	Group Working Ethernet Uplink port identified by the pair Slot#/Eth#
	P: Slot/Pon	Group Protection Ethernet port identified by the pair Slot#/Eth#
Priority: Switch over conditions' priority level classification	**Condition**	Type of conditions slectable for switch over cause; currently two high priority conditions can be configured to cause switch over to a protection state • **Generalized Line Card Failure** • **LOS**
	Enable	Flag; if selected enables the condition it refers to to be used as as switch over cause.

The "Add" button allows the configuration of a new Ethernet protection group, by opening a configuration Dialog Box, Figure 115. Refer to Table 72 for the description of the configuration parameters

Figure 115. Add Ethernet protection Group# Dialog box configuration parameters

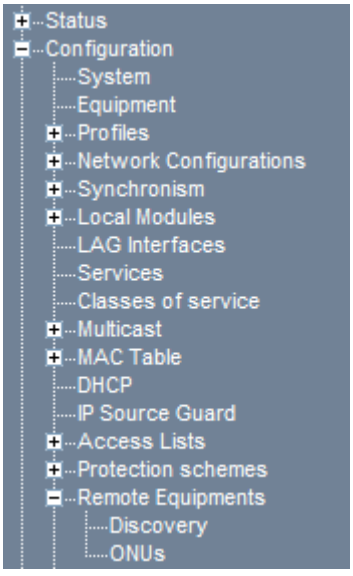


REMOTE EQUIPMENT

The Remote Equipment configuration sub-menu has two items, Figure 116:

- Discovery
- ONUs

Figure 116. Remote equipment configuraton sub-menu



REMOTE EQUIPMENT:: DISCOVERY

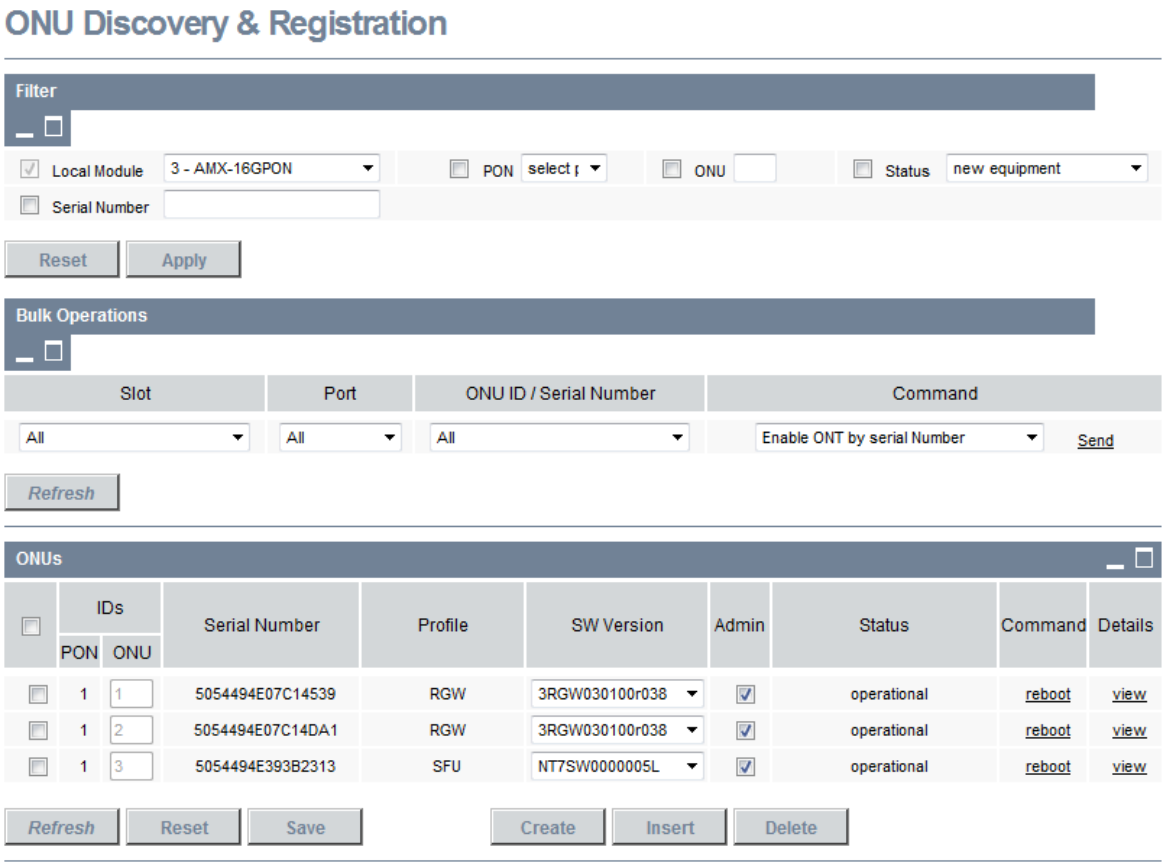
The OLT has an automatic detection process of new ONU/T's, where they appear/disappear automatically from the window if they aren't registered. In case they are registered, but there is no communication between the OLT and the ONU, the ONU goes to Absent state.

In CLI ONU discovery related commands in section

"discovery" sub-node and subsections.

In the OLT is possible to insert ONUs offline by a manual insertion specifying the line card, GPON interface, ONU ID and the serial number.

Figure 117. Remote equipment discovery



In order to easily find remote equipment, it is possible to apply one or a combination of filters:

Table 73. Filter parameter values to apply in remote equipment discovery

Filter	Description
Local Module	Line Card (2…19)
PON	GPON Interface (1…8)
ONU	ONU/T Identifier (1…64)
Status	ONU/T Status (New Equipment, Operational, Absent, Out of Service, Conflict, Processing, Registry Error, Configuration Error)
Serial Number	IP address of the Static Group

On the Bulk Operations tableIt is possible to execute a given operation (by selecting the corresponding command) on a group of ONUs, by selecting per slot, per port and per ONU ID/serial Number:

Table 74. Bulk Operations table parameter values

Parameter	Description
Slot	Selection per LC slot position on the (a given slot or all slots)
Port	Selection per GPON port - a given GPON port aor all GPON ports
ONU ID /SerilaNumber	Selection per ONU Identifier or serial number
Command	Command to execute on the bulk operation : **Enable ONT by serial number;** **Reboot;** **MIB Resync** Send will execute the selected command

The Remote Equipments List (ONUs) table is composed by the following parameter:

Table 75: ONUs list parameters

Parameter	Description
IDs	This parameter is composed by two columns PON and ONU; **PON**: identifies the GPON interface of the ONU/T **ONU:** identifies the ONU/T by ID
Serial Number	Identifies the Serial Number of the ONU/T (16 hexadecimal characters)
Profile	Identifies the ONU/T profile
SW Version	Selects the ONU/T software version mode. In case it's "Auto", the version that must be installed in the ONU/T, is the version defined as Auto in the Firmware Management table for the ONU/T Profile and HW version. In case it's a planned version, the version to install to the ONT will be the one defined. If it's Off, it won't be preformed any automatic update.
Admin	ONU/T Administrative State
Status	Indicates the ONU/T operational state. It can be in one of the following states: **New Equipment**: The ONU/T was discovered but isn't registered **Registry Error**: An error occurred while registering the ONU/T **Operational**: The ONU/T is in normal operating state **Processing**: ONU/T MIB SYNC is being performed, in this state the ONU/T doesn't accept any configuration **Configuration Error**: An error occurred while configuring the ONU/T **Absent**: The ONU/T is registered but inaccessible. It's possible to make configurations. **Conflict:** There is a conflict with another ONU/T **Out of Service**: The ONU/T is registered, but administratively out of service. It's possible to make configurations.
Command	Allows making a remote reboot to the ONU/T. It's only possible to make this command when the ONU/T is in "Operational" or "Configuration Error" state
Details	By pressing view, a window will open showing the ONU/T configuration details and it's possible to change the ONU/T Serial Number (Figure 118)

Figure 118.Changing ONU/T Serial Number

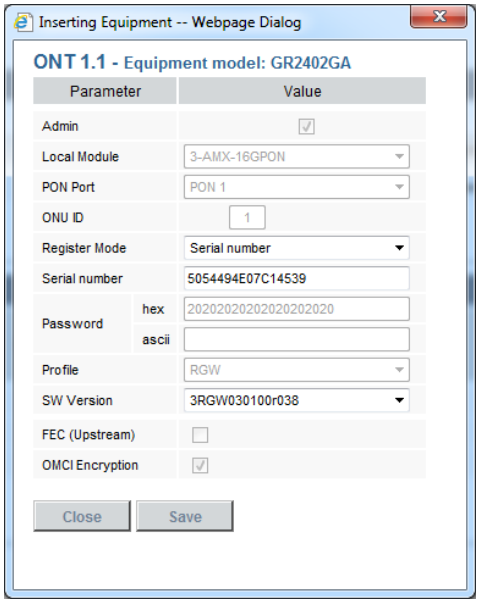


Table 76: Inserting Equipment window parameters

Parameter	Description
Admin	ONU/T Administrative State
Local Module	Indicates the local module, Slot/Card pair the ONU/T is connected to
PON Port	Indicates the PON Port the ONU/T is connected to
ONU Id	Indicates the ONU/T Identifier (currently 1 to 64)
Register Mode	ONU register mode: **Serial Number** **Password** **Serial Number and Password**
Serial Number	Identifies the Serial Number of the ONU/T (16 hexadecimal characters)
Password	ONU password; Can be and hexadecimal value or an AScii string
Profile	Identifies the ONU/T profile
SW Version	Selects the ONU/T software version mode. **Auto:** the version that must be installed in the ONU/T, is the version defined as Auto in the Firmware Management table for the ONU/T Profile and HW version. **Version:** In case it's a planned version, the version to install to the ONT will be the one defined. **Off:** If it's Off, it won't be performed any automatic update. **New Version:** the new version of theSW will be installed
FEC (Upstream)	Flag; if selected indicates FEC is used in the upstream direction
OMCI Encryption	Flag; if selected indicates OMCI Encryption is used.

There are two different ways to insert a new ONU/T:

- **Online**, Figure 119: In this case the ONU/T is connected to the GPON Interface and is in "New Equipment" state. To insert the ONU/T the user must select the ONU/T checkbox and press the "Insert" button. In case the ONU id is "0", the system will assign the first ONU ID available in the GPON Interface, in the example, the

value in the IDs Column ONU box will change from 0 to 1, assuming this is the first ONU to be inserted in this PON interface.

- **Offline**, Figure 120.By pressing the button Create, a window will open. In this window it's possible to configure the necessary parameters to insert a new ONU/T (Board, PON Port, ONU id, Serial number and profile), after configuration the button "Add "must be pressed to insert the ONU/T.

Figure 119. ONU/T online insertion

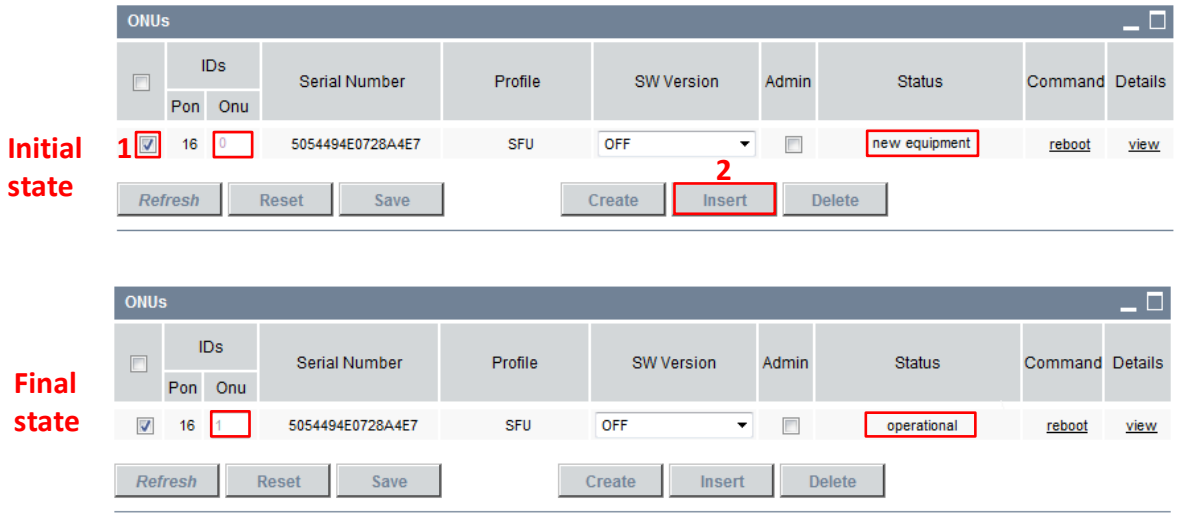
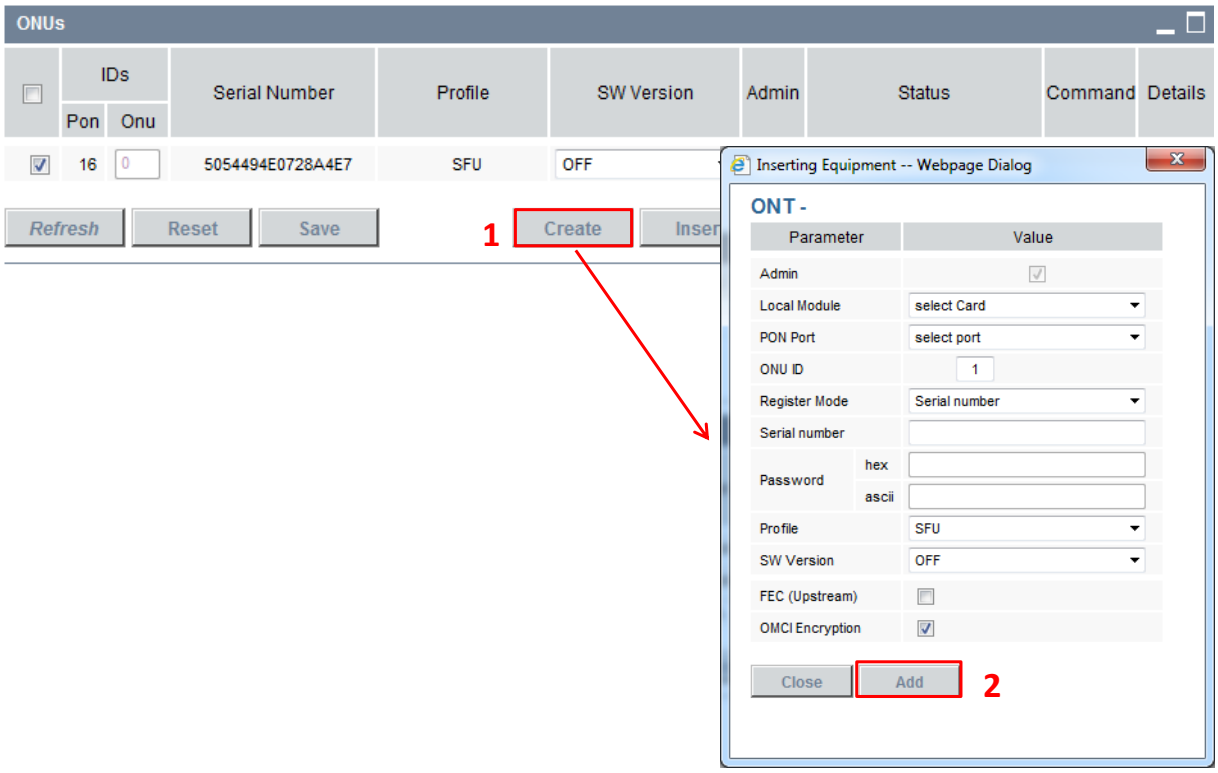


Figure 120. ONU/T Offline insertion



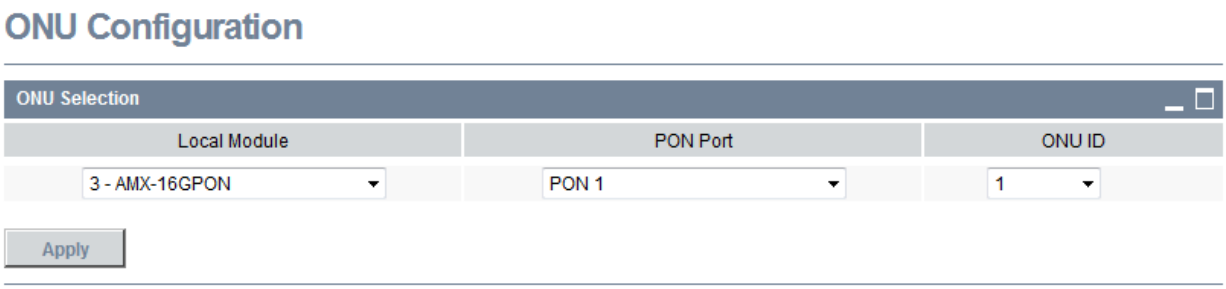
REMOTE EQUIPMENTS:: ONUs

In CLI ONUs related commands are described in section “onu” sub-node and subsections.

ONT configuration window is composed by the following tables:

- ONU Selection
- System Parameters
- PON Interfaces
- Ethernet Interfaces
- Analog RF Interfaces
- VoIP Interfaces
- E1 Interfaces
- VEIP Interfaces
- T-CONT
- Services

Figure 121. ONU Selection filter

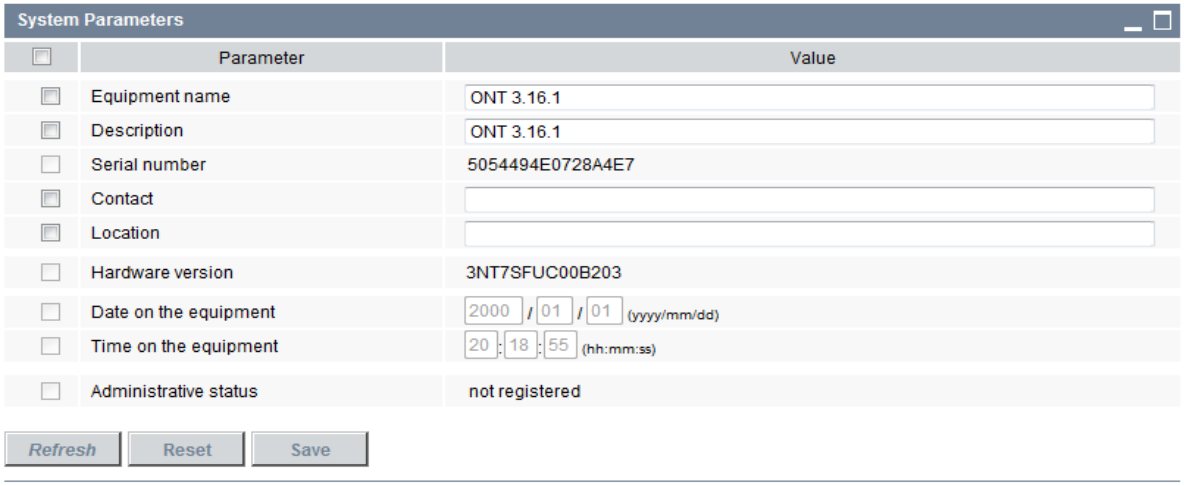


In the ONU selection table it's possible to define the criteria to filter the pretended ONUs in the search. This table is composed by the following Combo Box:

Table 77. ONU possible values to apply in remote equipment search

Parameter	Description
Local Module	Line Card (2…19). Only registered GPON line cards will be available to select.
PON Port	GPON Interface (1…8)
ONU Id	ONU/T Identifier (1…64)

Figure 122. System parameters configuration



The System Parameters configuration table is composed by the following parameters:

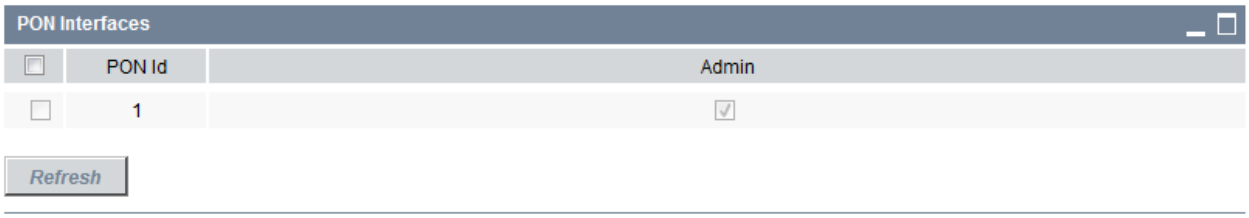
Table 78. System Parameters configuration table

Parameter	Description
Equipment name	Custom field used to tag the equipment (should be unique among all equipments). Example: ONT1.1
Description	Brief description of the equipment

Serial Number	ONU/T Serial Number (16 Hexadecimal characters)
Contact	Entity responsible for this equipment (department, person, etc)
Location	Custom field with the equipment location
Hardware Version	ONU/T Hardware Version (14 characters)
Date on the equip.	Displays date on the equipment (UTC)
Time/Hour on the equipment	Displays time on the equipment (UTC)
Administrative status	Displays administrative state

In PON Interfaces table is possible to verify the PON interface configuration.

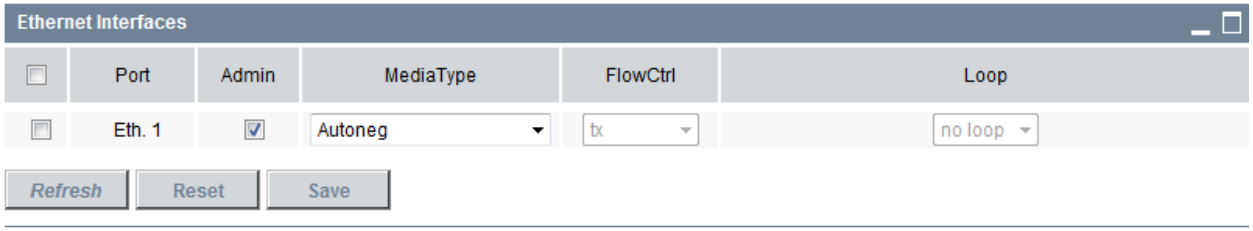
Figure 123. PON interfaces configuration



In CLI remote equipment Ethernet interface related commands are described in section

"ethernet" sub-node and subsections.

Figure 124. Ethernet interfaces configuration



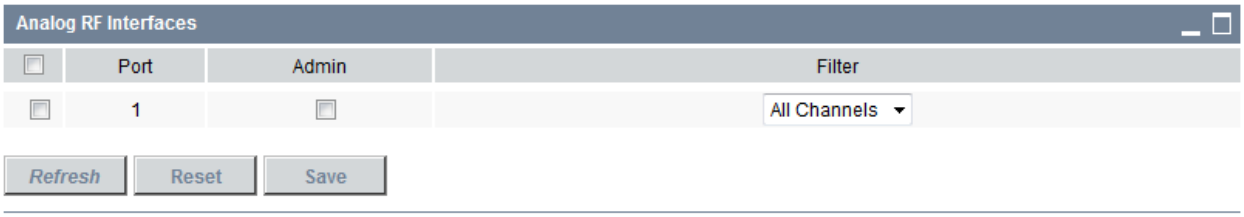
The Ethernet Interfaces configuration table is composed by the following parameters

Table 79. Ethernet Interfaces configuration table

Parameter	Description
Port	Port identifier
Admin	Port Administrative State
Media Type	Link Speed and Duplex (Autoneg,10BASE-T Full Duplex,100BASE-T Full Duplex,1000BASE-T Full Duplex)
Flow Control	Activates the transmission and processing of Pause Frames (always disabled)
Loop	Activates the Port loop (always no loop)

In CLI remote equipment Analog RF interface related commands are described in Sub-node section "analog-rf" sub-node and subsections.

Figure 125. Analog RF interfaces configuration



The Analog RF Interfaces configuration table is composed by the following parameters:

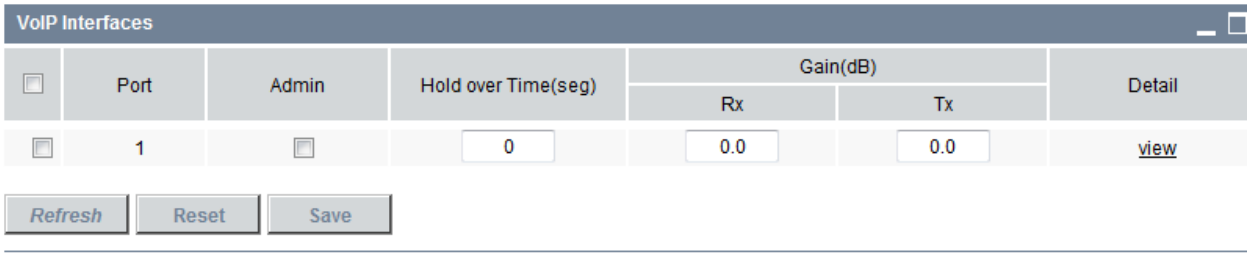
Table 80. Analog RF Interfaces configuration table

Parameter	Description
Port	Port identifier
Admin	Port Administrative State

Filter	Selects the filter (All, 15, 25, 35 Channels) to be applied to the RF Interface. In case the user tries to configure a filter that isn't supported in the Hardware, the ONT won't do anything.

In CLI remote equipment VoIP interfaces related commands are described in Sub- node "voip" sub-node and subsections.

Figure 126. VoIP interfaces configuration

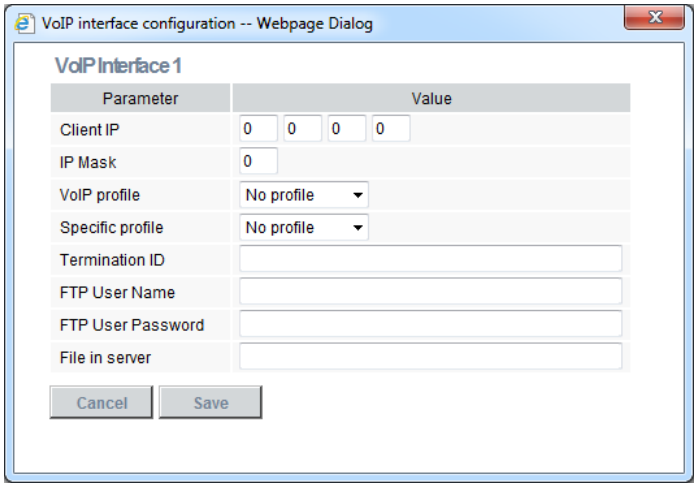


The VoIP Interfaces configuration table is composed by the following parameters:

Table 81. VoIP Interfaces configuration table

Parameter	Description
Port	Port identifier
Admin	Port Administrative State
Hold Over Time (sec)	This parameter determines the time during which POTS loop voltage is held up when the ONT is not ranged on the PON. When the ONT ranges successfully on the PON, it restores POTS loop voltage immediately and reset the timer.
Gain dB	**Rx**: Specifies the receiver gain (-12.0…+6 dBm) **Tx**: Specifies the transmitter gain (-12.0…+6 dBm)
Detail	By pressing view, a window will open and it's possible to configure additional information related with the FXS interface

Figure 127. VoIP interface configuration



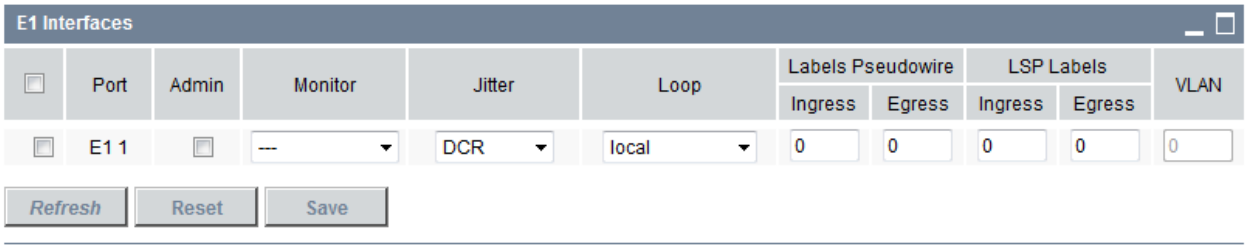
The detail VoIP Interfaces configuration window is composed by the following parameters:

Table 82. VoIP Interfaces configuration window parameters

Parameter	Description
Client IP	Client IP address used by the VoIP client. If the value is 0.0.0.0, the client IP address will be obtained by DHCP
IP Mask	IP Network Mask
VoIP profile	VoIP server profile (Voice Gateway, Server IP, Port, Default Gateway)
Specific Profile	VoIP Specific profile specifies the ftp server used to get the .xml file that contains the client configuration
Termination Id	Used for MEGACO(H.248) to identify the line termination
FTP User name	FTP user name to be used to login to the ftp server used to get the .xml file that contains the client configuration
FTP User Password	FTP user password to be used to login to the ftp server used to get the .xml file that contains the client configuration
File in server	File to be downloaded from the ftp server. This is a .xml file that contains the client configuration (ex. supported codec's, number, etc)

In CLI remote equipment Services related commands are described in section "services" sub-node and subsections.

Figure 128. E1 interfaces configuration



The E1 Interfaces configuration table is composed by the following parameters

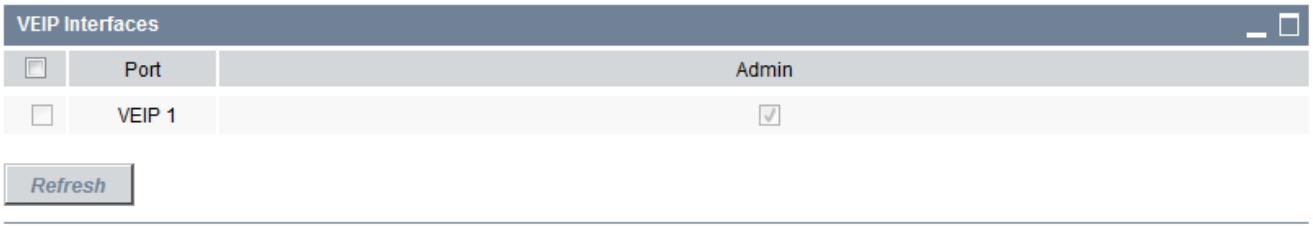
Table 83. E1t Interfaces configuration table

Parameter	Description
Port	Port Identifier
Admin	Port Administrative State
Monitor	E1 Frame (none|g.704|g.704-g.706)
Jitter	E1 timing configuration (dcr|re-timing|acr)
Loop	E1 loop configuration (no-loop|local|remote)
Labels Pseudowire	Pseudo wire configuration for a given ONU E1 interface. Ingress –ingress pw Egress – engress pw
LSP labels	LSP label configuration for a given ONU E1 interface.

	Ingress –ingress LSP label (16..1048575) Egress - engress LSP label (16..1048575)
VLAN	Used VLAN

VEIP, Virtual Ethernet Interface ports at the WAN ONT-RGW interface and correspond to the UNI-C-VLANs. One VEIP.xx must be created at the RGW for each XX UNI-C-VLAN, and used to configure the respective service at the ONT-RGW management interface.

Figure 129.VEIP interfaces configuration



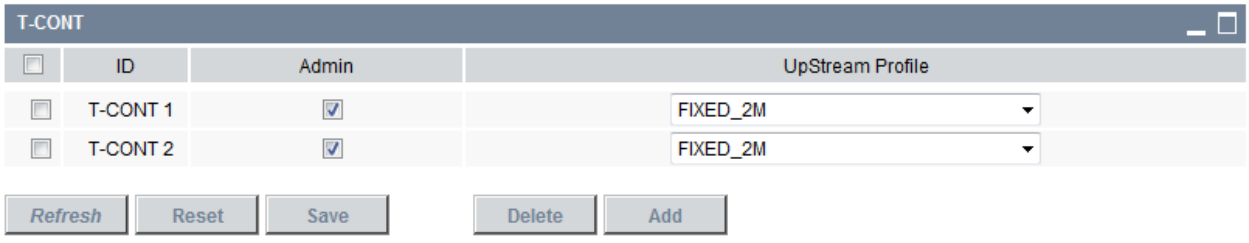
The VEIP Interfaces configuration table is composed by the following parameters

Table 84. VEIP Interfaces configuration table

Parameter	Description
Admin	Flag, Port Administrative State

T-CONT, Traffic Containers, are used for the management of upstream bandwidth allocation.

Figure 130.T-CONT configuration

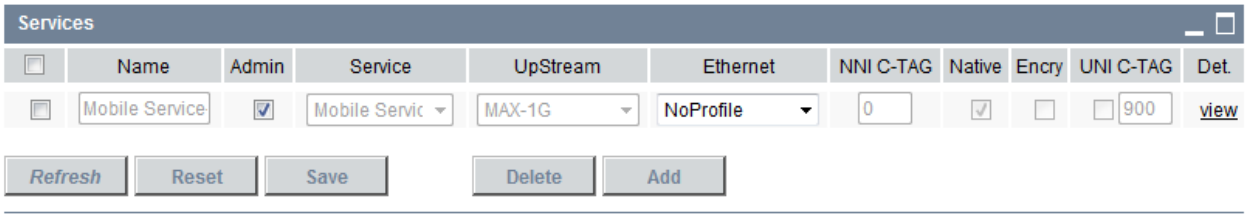


The VEIP Interfaces configuration table is composed by the following parameters

Table 85. T-CONT configuration table

Parameter	Description
ID	T-CONT Identifier
Admin	Flag, Port Administrative State
Upstream Profile	Upstream DBA profile; selected from the combo box with all previously definedavailable UPstream DBA profile

Figure 131. Services configuration



The Services configuration table is composed by the following parameters:

Table 86. Services configuration table

Parameter	Description
Name	ONU/T Service name
Admin	ONU/T Service Administrative State
Service	OLT Service identifier
Upstream	Identifies the Upstream profile associated to the service
Ethernet	Identifies the Downstream profile associated to the service
NNI C-TAG	Inner VLAN ID (client) on the network-facing (Ethernet) interface. (1..4094)
Native	In case this service is untagged in the client port, this option must be active. It's only possible to have a Native service by ONT port.
Encry	Enable or disable encryption flag.
UNI C.-TAG	VLAN ID delivered/received from the (Ethernet) subscriber-facing interface at the ONU. (1..4094) . In case the vlan in the client port is different from the one provisioned in OLT services, the checkbox must be selected, and the vlan value must be configured (1…4094)
Det.	Details. By pressing view, a window will open and it's possible to change some of the configured parameters as DHCP option and ports associated to the service (Figure 132)

Figure 132. View/Add Service Configuration Dialog box

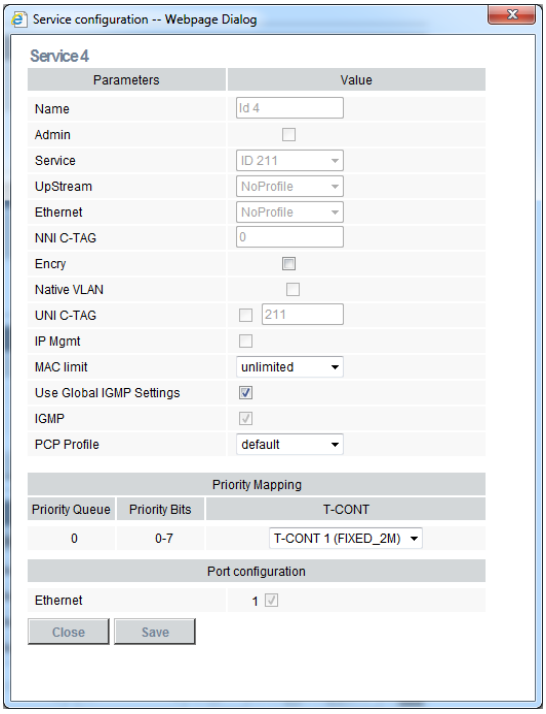


Table 87. Services configuration details

Parameter	Description
Name	ONU/T Service name
Admin	ONU/T Service Administrative State
Service	OLT Service identifier
Upstream	Identifies the Upstream profile associated to the service
Ethernet	Identifies the Downstream profile associated to the service
NNI C-TAG	Inner VLAN ID (client) on the network-facing (Ethernet) interface. (1..4094)
Native	In case this service is untagged in the client port, this option must be active. It's only possible to have a Native service by ONT port.
Encry	Enable or disable encryption.
Native VLAN	Flag (Enable|Disable)
UNI C-TAG	VLAN ID delivered/received from the (Ethernet) subscriber-facing interface at the ONU. (1..4094) . In case the vlan in the client port is different from the one provisioned in OLT services, the checkbox must be selected, and the vlan value must be configured (1…4094)
IP Mgmt	If enabled, use this service for IP management of the ONU (enable|disable)
MAC Limit	Slectable from combo box (unlimited| limit value – numerical)
Use Global IGMP Settings	Flag (Enable|Disable)
IGMP	Flag (Enable|Disable)
PCP Profile	PCP profile slectable from a combo box with previously defined available PCP profiles
Priority	Service Priority Mapping configuration:

Mapping	**Priority Queue-** Queue Identifiuer, Numerical **Priority Bits –** Priorityqueue Bit mapping T**-CONT –** Used T-CONT, slectable from a combo box of available, previously defined T-CONT
Port Configuration	Attach an ONU interface to an ONU service.

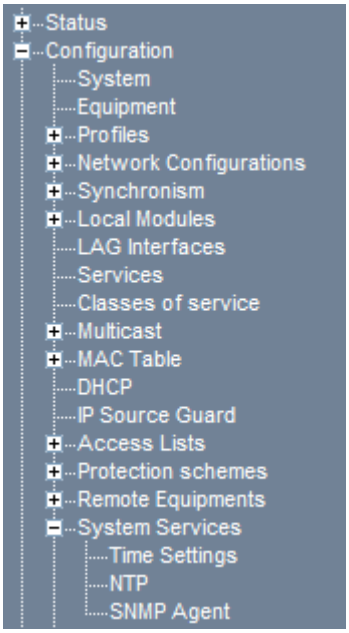
To add a service to the ONT, the user must press "Add" button and the window in Figure 132 will open. Refer to Table 87 for the service configuration parameter description.

SYSTEM SERVICES

The System Services configuration sub-menu has three items, Figure 133:

- Time settings
- NTP
- System Settings

Figure 133. System Services Configuration sub-menu



System Services node, sub nodes and related commands including configuration era described in CLI chapter, section "applications" node, subsection "time" sub-node.

SYSTEM SERVICES::TIME SETTINGS

Time Settings menu item opens a Clock and Timezone configuration window that is composed by two tables:

- Clock Configuration: where it's possible to configure the system clock. If NTP is enabled it cannot be configured.
- Timezones: where it's possible to define the timezones used by the equipment and used by the Central Management.

Clock and Time zone related commands are described in CLI chapter, section "time" sub-node and subsections.

Figure 134. Clock and Timezones configuration window

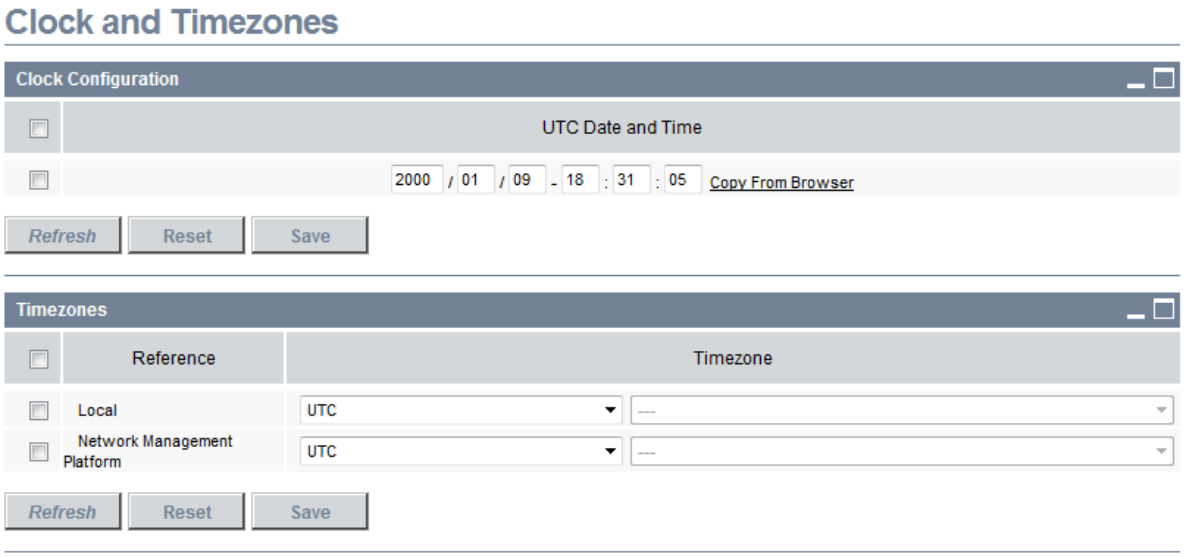


Table 88. Clock configuration parameter

Parameter	Description
UTC Date and Time	The clock using the following syntax: YYYY/MM/DD-hh:mm:ss **YYYY**: Year **MM**: Month **DD**: day **hh**: hours **mm**: minutes **ss**: seconds

Table 89.Timezones configuration parameters

Parameter	Description
Reference	Selects the reference used either by the equipment (Local) and the Network Management Platform
Timezone	It's composed combo boxes, allowing the selection of the country, and the region within the country.

SYSTEM SERVICES::NTP

In the NTP configuration window, it is possible to activate the NTP in OLT, and to configure the NTP servers.

NTP menu item opens a Network Time Protocol configuration window that is composed by two tables, Figure 135:

- Global NTP: that allows the activation of NTP in the OLT.
- NTP Servers: NTP servers' configuration table.

In CLI chapter, NTP related commands are described in section "ntp" sub-node and subsections.

Figure 135. Network Time Protocol Configuration Window

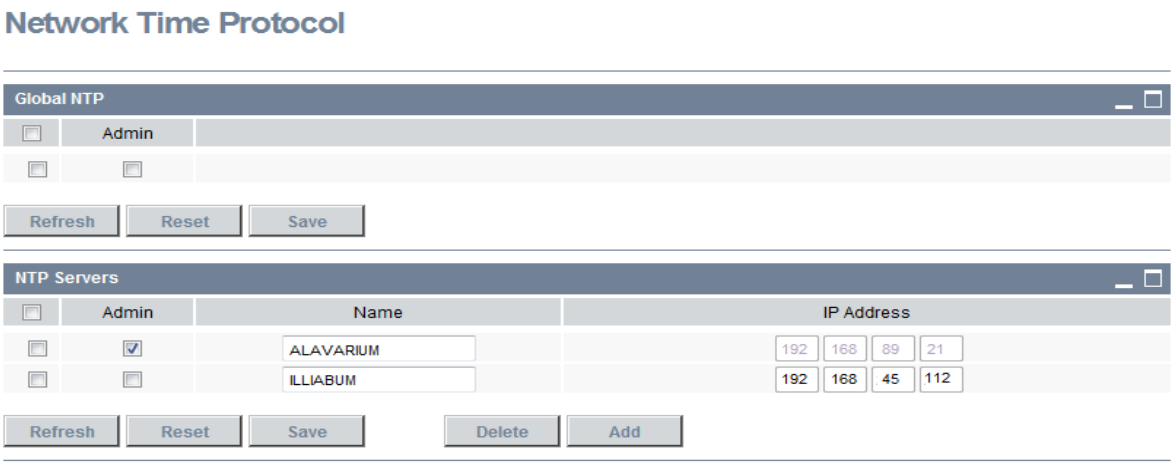


Table 90. Global NTP configuration parameter

Parameter	Description
Admin	NTP Administrative State

Table 91. NTP servers' configuration parameters

Parameter	Description
Admin	NTP server Administrative State
Name	NTP server name
IP Address	NTP server IP address

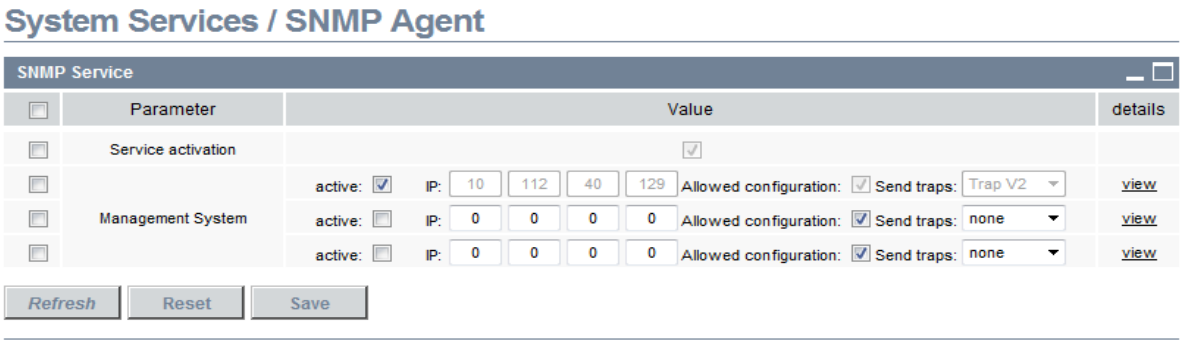
SYSTEM SERVICES::SNMP AGENT

In the System Services/SNMP Agent configuration window, it is possible to define the connection to the Network Management System.

System Services configuration window is composed by one table, the SNMP Service Table.

In CLI, Manager Configuration related commands are described in section "manager" sub-node and subsections.

Figure 136. System Settings/SNMP Agent window, SNMP Service Table



The Manager Configuration table is composed by the following parameters:

Table 92. System Settings/SNMP Service parameters

Parameter		Description
Service Activation		Service Activation Flag (Enable/disable). Must ne enable to activate the SNMP Service
Management System	**Active**	Active Flag. (Enable/disable). Must be Enable to activate the management system defined in this table line.
	IP	Network Management System IP Address
	Allowed Configuration	Allowed Configuration Flag (enable/disable). Must be enable to allow the definition of the Send Traps mode
	Send Traps	Send Traps defines the mode used for the OLT to communicate with Network Management System. (none|Trap/Ack|Trap V2| Inform)
	Details	By pressing view, a dialog box will open showing management system configuration details, Figure 137.

Figure 137. Management System configuration details dialox box

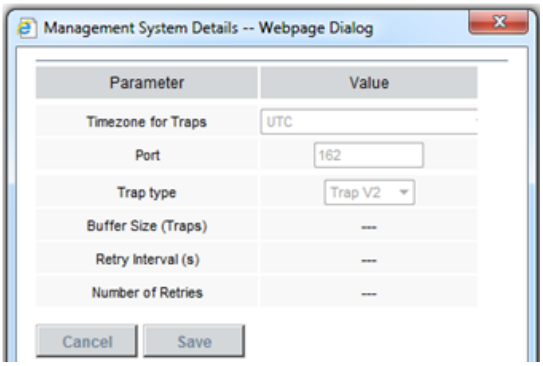


Table 93. Management System Current Configuration parameters

Parameter	Description
Timezone for Traps	Specified Timezone used for Traps
Port	Identifies the IP port number to use. (1..65535)
Trap Type	Mode used for the OLT to communicate with Network Management System. (none|Trap/Ack|Trap V2| Inform)
Buffer Size (Traps)	Specified trap buffer size in bytes
Retry Interval (s)	Specified wait period in seconds before re-sending the trap when no ACK is received
Number of Retries	Specified number of retries before skipping the current trap

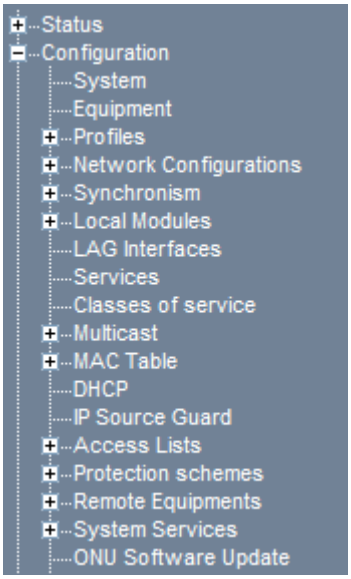
Table 94. List of traps send by the OLT

Code	Entity	Description
3	Board	Board has been removed
4	Board	Board is in conflict (a different type of card is expected)
5	Board	Signal the NMS that a configuration has been made in the equipment (e.g. via CLI or webTI for example).
7	Interface	SFP Fail
11	Equipment	Loss of connectivity with the ONU
12	Equipment	48V present
13	Equipment	Temperature alarm
16	Equipment	System boot
18	Interface	Loss of signal (LOS)
26	Interface	Signal Degrade
50	Equipment	Synchronism reconfiguration
79	Interface	Ethernet Link Down
235	Equipment	Mismatch of FW version between the two switch fabrics
296	Board	FAN fail
372	Equipment	Switch fabrics handover due to protection scheme
403	ONU	ONU Loss of signal (LOSi)
404	ONU	ONU Loss of frame (LOF)
405	ONU	ONU Loss of PLOAM
406	ONU	ONU Drift of Window
407	ONU	ONU Signal Fail
408	ONU	ONU Signal Degraded
409	ONU	ONU Loss of GEM channel delineation
410	ONU	ONU Remote Defect Indication (RDI)
411	ONU	ONT Start-up Failure

412	ONU	ONU Loss of Acknowledge
413	ONU	ONU Deactivate Fail
414	ONU	ONU Physical Equipment Error
415	ONU	ONU Receive Dying-Gasp
416	ONU	ONU Transmission Interference Alarm
417	ONU	ONU Video Output Below Threshold
418	ONU	ONU Video Output Above Threshold
419	ONU	ONU Received 1490nm optical power below threshold
420	ONU	ONU Received 1490nm optical power above threshold
421	ONU	ONU Transmit optical power below lower threshold
422	ONU	ONU Transmit optical power above upper threshold
423	Interface	LAG Active Member Down
425	Interface	Signal Fail
426	Interface	Laser End of Life pending
435	ONU	ONU upgrade FW error (no file found)
447	Board	Board entered the “busy” state.
451	Equipment	LOMF detected on synchronism junction number one
452	Equipment	LOMF detected on synchronism junction number two
542	Equipment	LOS detected on synchronism junction number one
543	Equipment	LOS detected on synchronism junction number two
556	Interface	The input power of the EDFA is' below the minimum threshold
557	Interface	The input power of the EDFA is above the maximum threshold
558	Interface	No signal was detected in the input EDFA
559	Interface	The output power of the EDFA is below the minimum threshold
560	Interface	The output power of the EDFA is above the maximum threshold
561	Interface	EDFA transmission fail
562	Interface	The EDFA temperature is below the minimum threshold
563	Interface	The EDFA temperature is above the maximum threshold
604	Equipment	Reset factory settings
605	Equipment	Restore DB backup file
1002	Board	New board was detected
1006	ONU	ONU FW upgrade (indicates success or fail)

ONU SOFTWARE UPDATE

Figure 138. ONU Software Update Configuration menu item



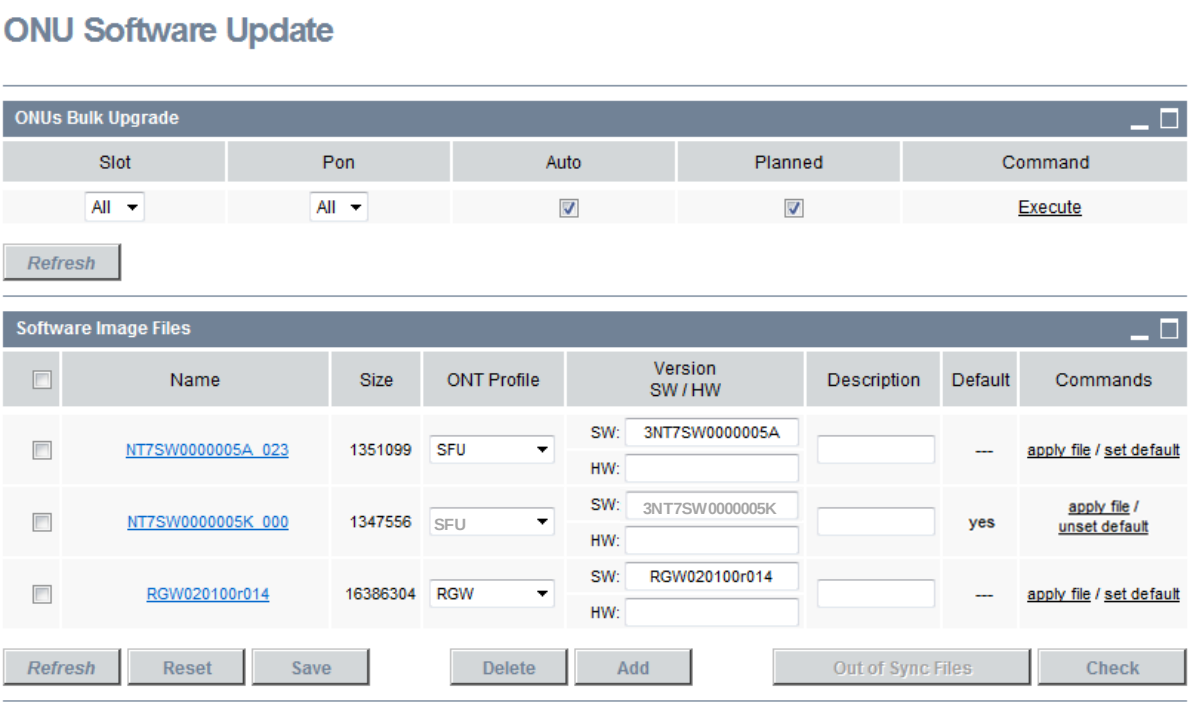
The selection of ONU Software Update Configuration menu item opens an ONU Software Update configuration window.composed by two tables:

- ONUs Bulk Upgrade: where it's possible to send automatic/planned upgrades to the ONU's
- Software Image Files:: where it is possible to manage the ONU Firmware files

In order to use ONT SW upgrade Auto mode, an active SW version must be previously set as default for the respective ONT profile. In the case there is no default SW version set for the ONT profile the following alarm message will be returned by the system : "SW and HW version mismatch"when executing Auto ONT SW upgrade

In CLI Firmware related commands are described in section "onu-upgrade" sub-node and subsections.

Figure 139. ONT firmware update



The ONUs Bulk Upgrade table is composed by the following parameters:

Table 95. ONUs Bulk Upgrade configuration parameters

Parameter	Description
Slot	Selects the Slot to make the upgrades
Pon	Selects the PON to make the upgrades
Auto	Selects the ONUs with Software Mode "Auto"
Planned	Selects the ONUs with Software Mode "Planned Version"
Command	By pressing Execute command the selected ONT's will make upgrade

The Software Image Files table is composed by the following parameters:

Table 96. Software Image Files configuration parameter

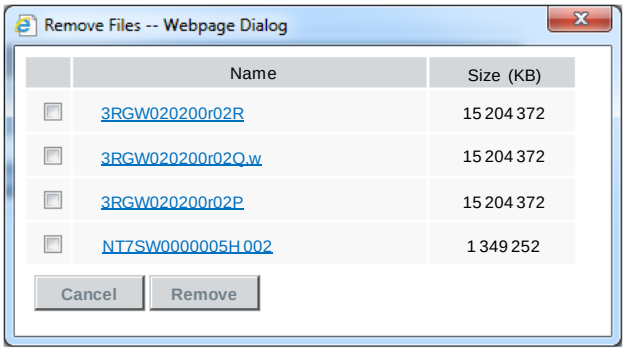
Parameter	Description
Name	Name of the SW version file
Size	Size of the SW version file
ONT Profile	ONT profile to which the version applies to
Version SW/HW	SW: Name of the Software version HW: Hardware to which the Software Version applies to. If it's blank it applies to all ONT's with the selected ONT profile
Description	Description of the Software version
Default	Signals that the version is the default version to some ONT profile/HW version

Commands	**Apply file**: Allows to select one or a group of ONT's to make upgrade **Set default**: Set's the default version to some ONT profile/HW version

The "Out of Sync Files" Button, Figure 139, lists all files not synchronized with the local management. These files are not presented in the Software Image Files Table. The out of Sync files list is shown in a pop up window. The user can remove the files from the system using the "Remove" button in the pop up window, Figure 140.

The "Check" Button, Figure 139, resynchronizes the local management with the equipment filesystem.

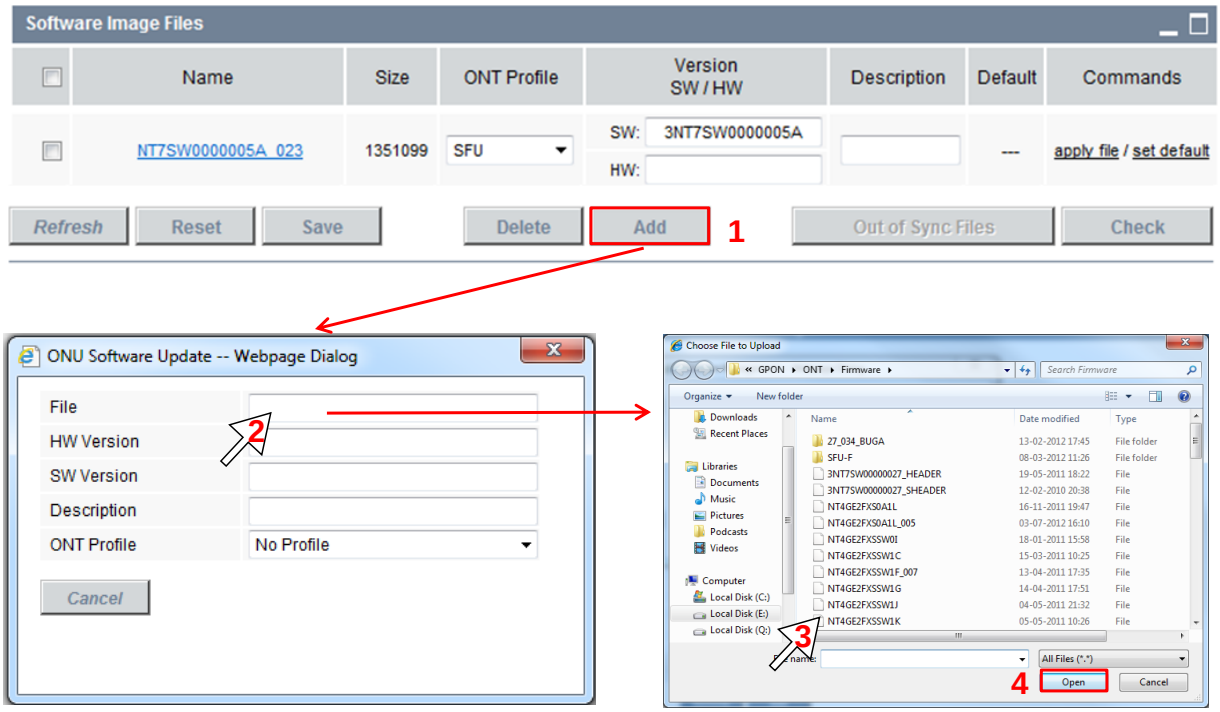
Figure 140: Out of Sync files list



To add a new ONU Software/Firmware version, Figure 141:

- Press the Add button,1, and the ONU Software Update dialog Box will appear:
- Pressing the "File" field, 2, the Choose file to Upload Dialog box will appear allowing the selection of a file, from a repository, for example the PC hard disk, to upload to the OLT
- Select the file to upload, 3
- Finish the upload, 4. The file will then be available at the Software Image Files Table.

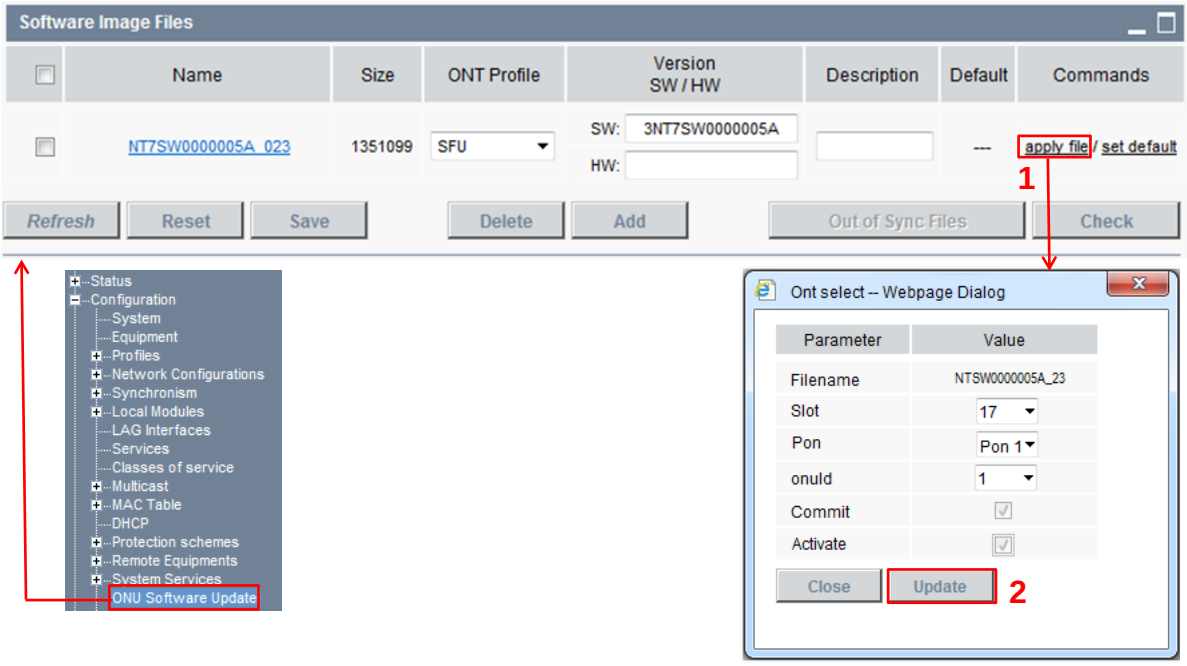
Figure 141. ONU Firmware version upload



To make the ONU Software Upgrade the user must:

- Press the apply file, 1, in the commands column in the Software Image Files table, Figure 142. There the user can choose which ONU we wants to make the upgrade, only ONU's with SW Mode "OFF" will appear to select
- Pressing Update Button, 2, will start Update for the configured selection

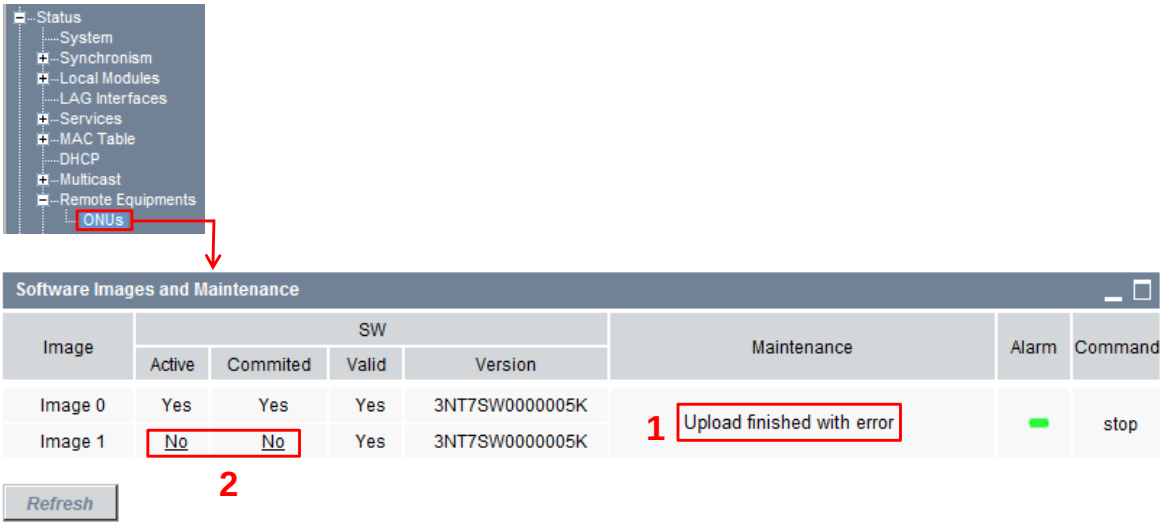
Figure 142. Selecting the ONU(s) to upgrade



In the Status menu, Remote Equipments, ONUs, it is possible to check the upgrade status in "Software Images and Maintenance" table on the column Maintenance, 1, Figure 143. The number between ( ) indicates the number of bytes transmitted. In the end of the upload you can have "Upload finished with error" in case an error occurred or "Upload finished successfully" in case the file was well transferred.

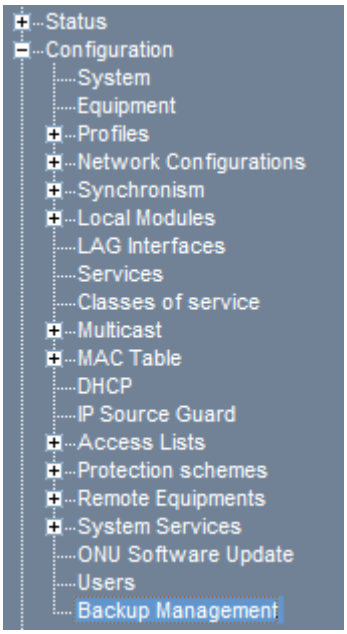
To finish the ONU firmware upgrade the user must execute Commit and Activate by pressing the button "No", 2

Figure 143. Check ONU Upgrade Status



BACKUP MANAGEMENT

Figure 144. Backup Management Configuration menu item



The Backup Management window consists of a Local Backups table where the equipment's database backup files are listed.

In the CLI section, Backup related commands are described in section "backup-manager" node and subsections.

Figure 145. Backup Manager

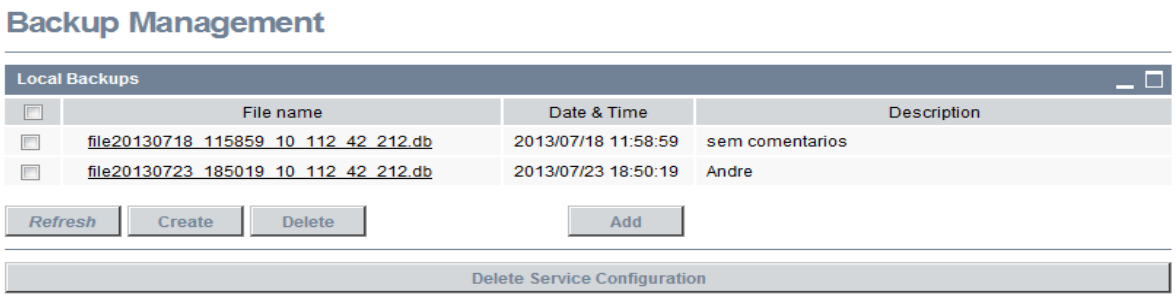


Table 97. Backup Manager Window parameters

Parameter	Description
File name	Backup File name
Date & Time	Backup date and time

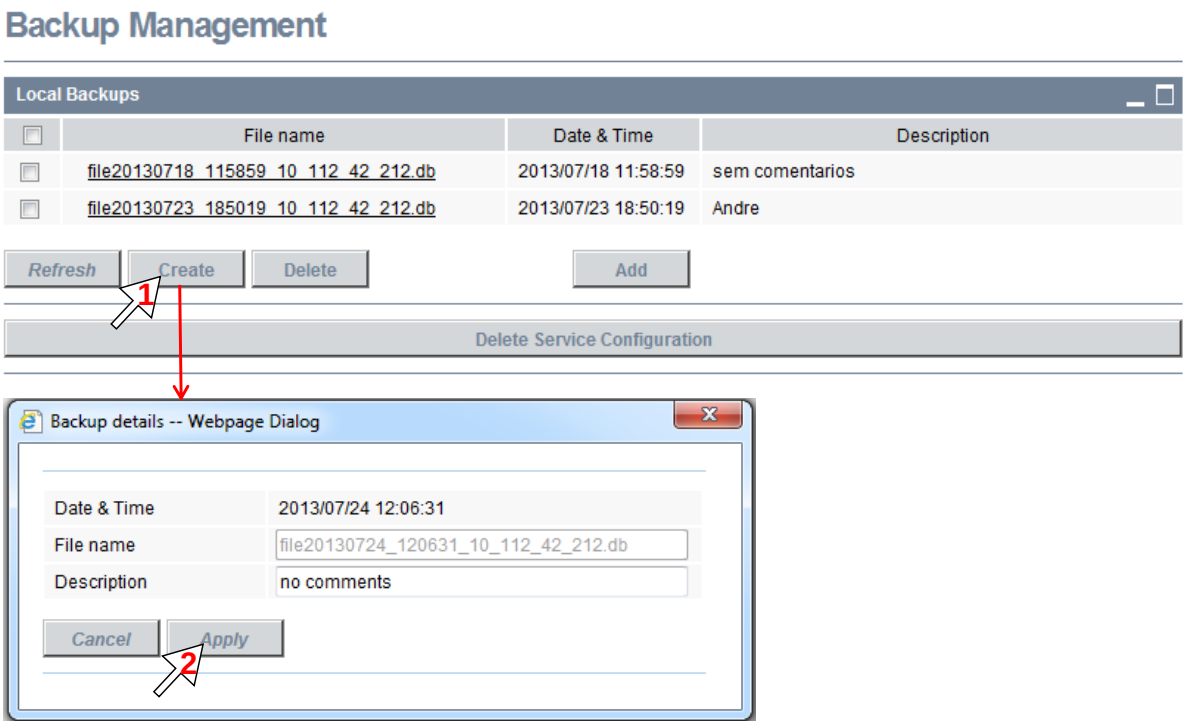
Description	Backup description

To create a System Database Backup, Figure 146:

The user must press the Create button, 1, and the Backup dialog box will appear.

- After filling the fields filename and description in the dialog box, pressing the Apply button, 2, will save the Database in the OLT file system.

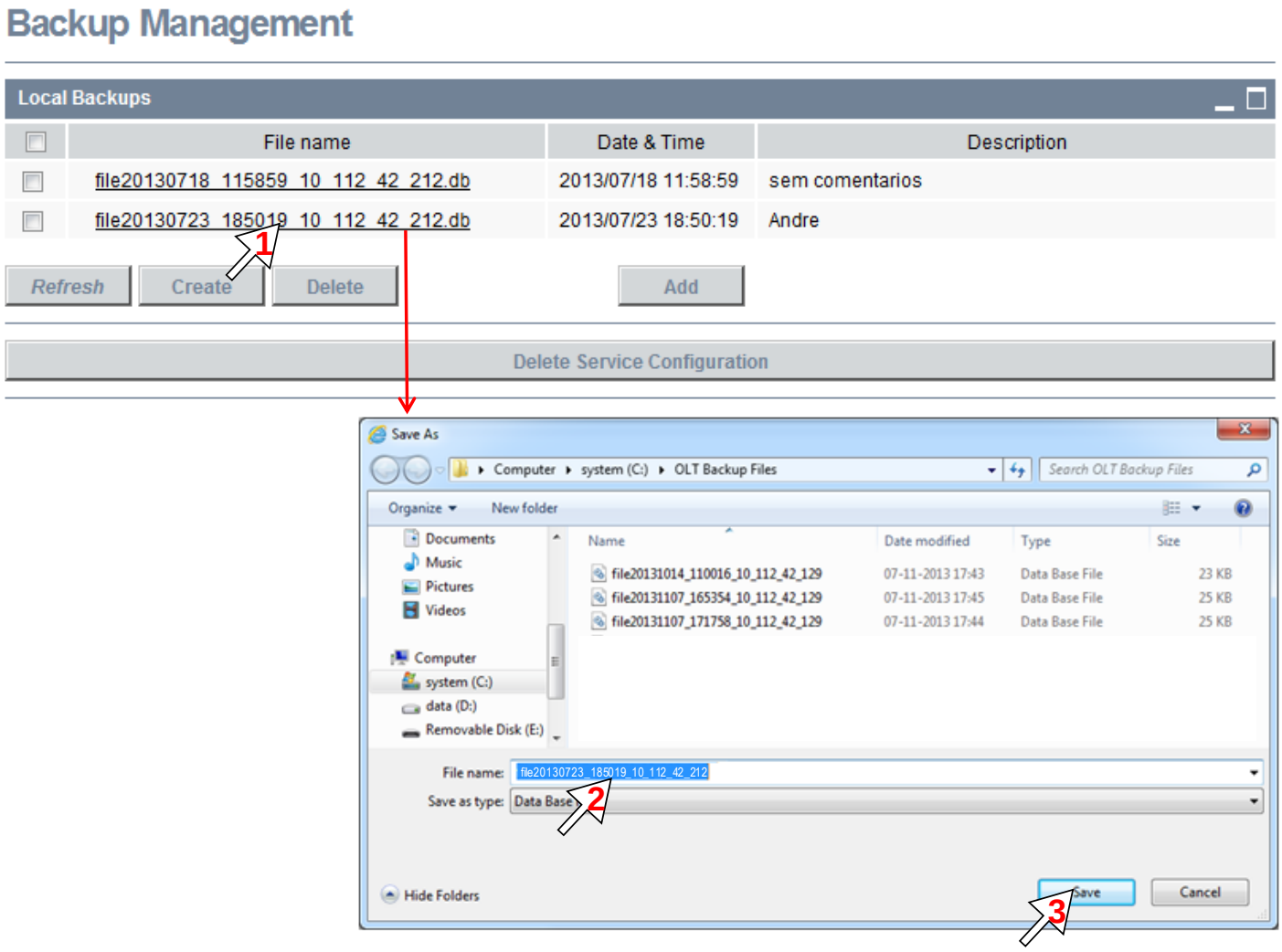
Figure 146. Create a Database Backup file



To save a System Database Backup file to a PC, Figure 147:

- The user must press the System Database Backup file link in the Local Backup table list, 1, and a Save As dialog box will pop up will appear.
- The filed File name is automatically filled with the System Database Backup file name, 2; this name can be changed by typing in the desired name
- Finalize by Pressing the “Save” button, 2, will save the Database in the OLT file system.

Figure 147. Save a Database Backup file to a PC



To add a database stored in the PC,Figure 148 :

- Press the Add button,1, and the “Send the Local Backup” dialog Box will appear:
- Pressing the empty field, 2, the “Choose file to Upload” dialog box will appear allowing the selection of a file, from a repository, to upload to the OLT
- Select the file to upload, 3 and 4
- Finish the upload, by pressing the ADD button, 5.
- The file will then be available at the Local Backups Table, Figure 149.

Figure 148. Database Upload

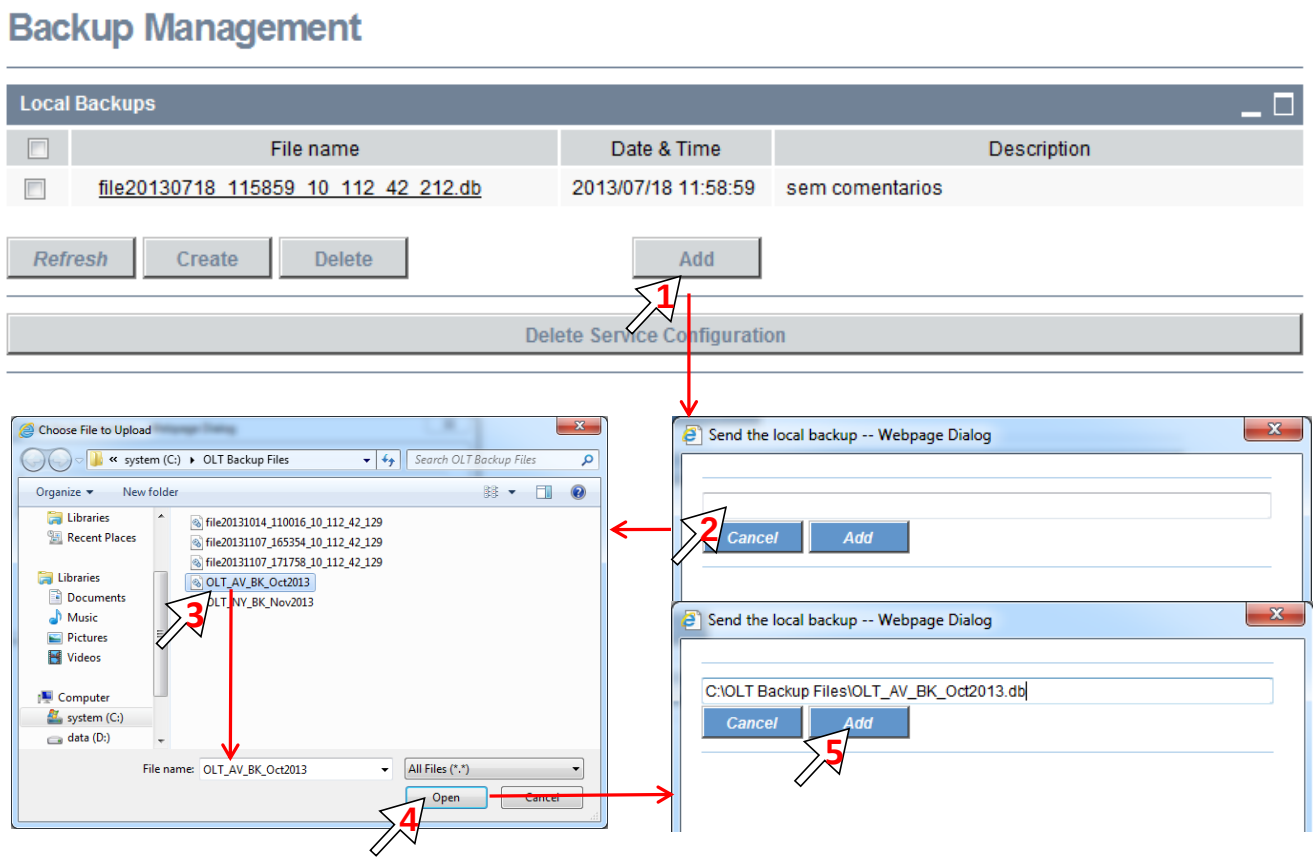
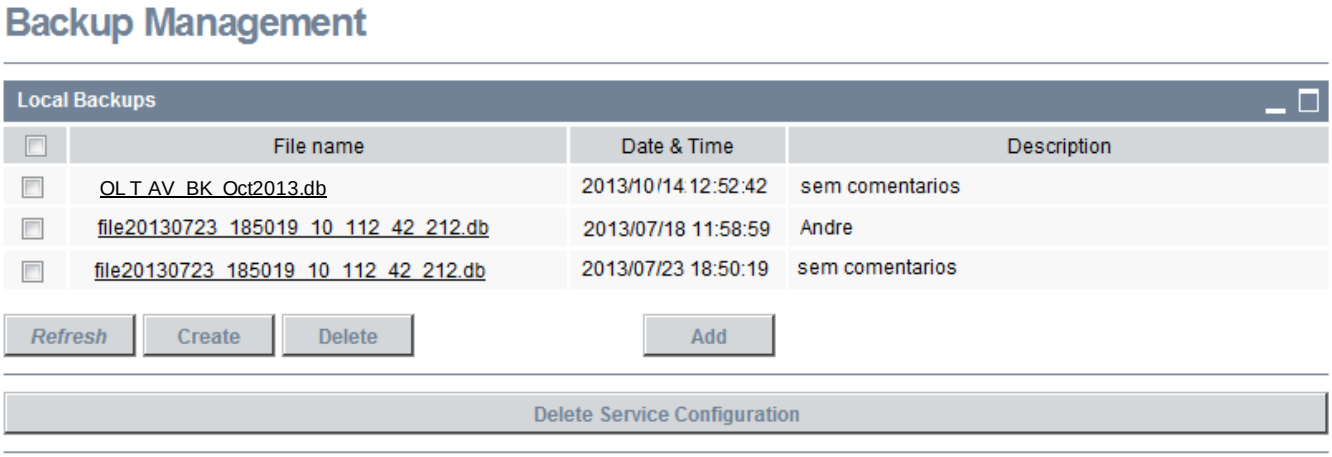


Figure 149. Uploaded file available in the local backup table

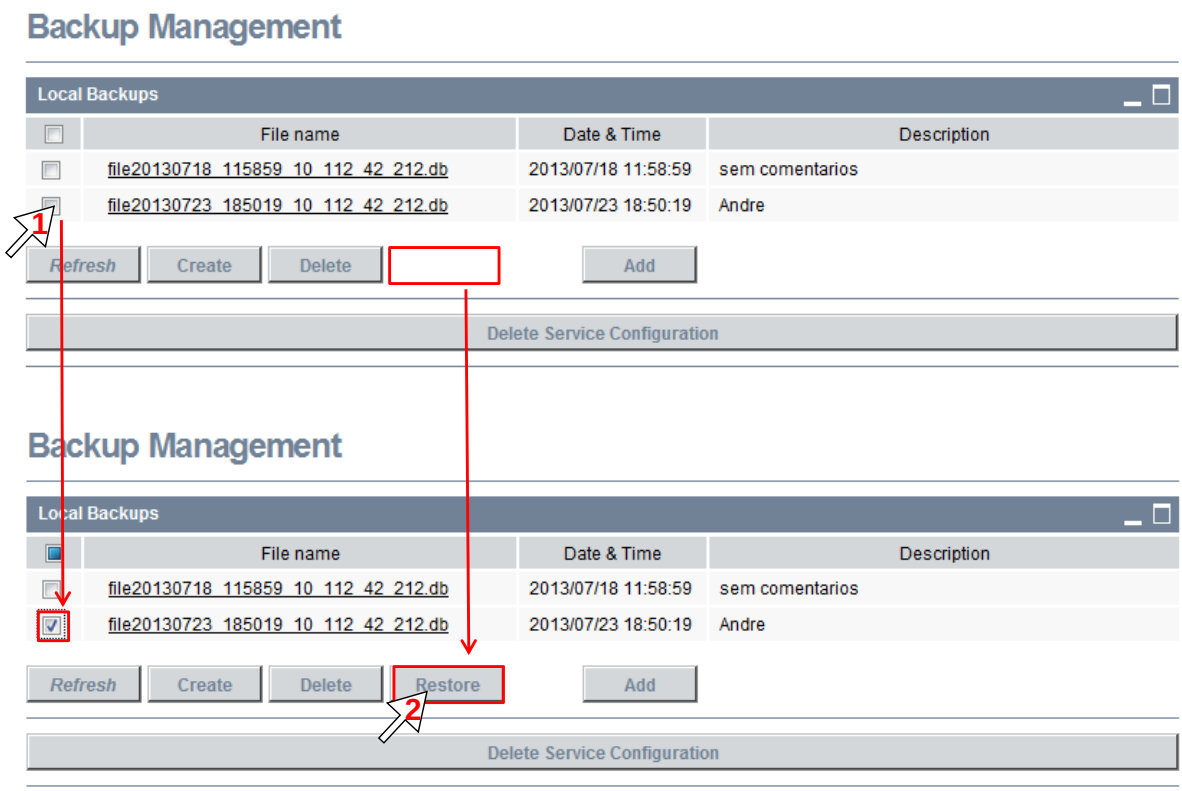


To restore a Database, Figure 150:

- first the user must select the pretended Database to load, 1

- Then press the button Restore, 3.
- After this the system will reboot and startup with the new Database.

Figure 150. Database Restore



In the Backup Manager window it's also possible for the user to reset to factory settings.. By pressing "Delete Service Configuration" button, the system will delete service configuration and reset to factory defaults except for the inband (activated ports included) and outband management interfaces.

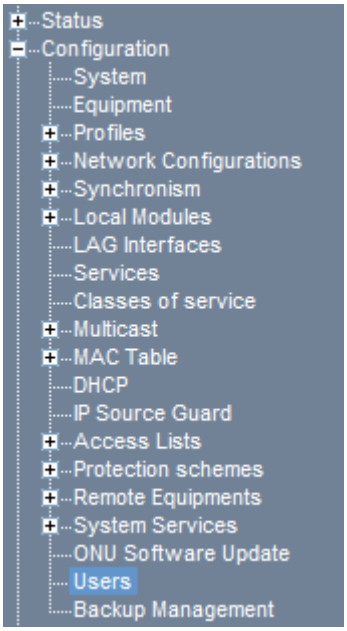
USERS

This item of configuration menu availability depends on the privileges of the user

Only Users with administrator permission can see and manage the list of the users in the system.

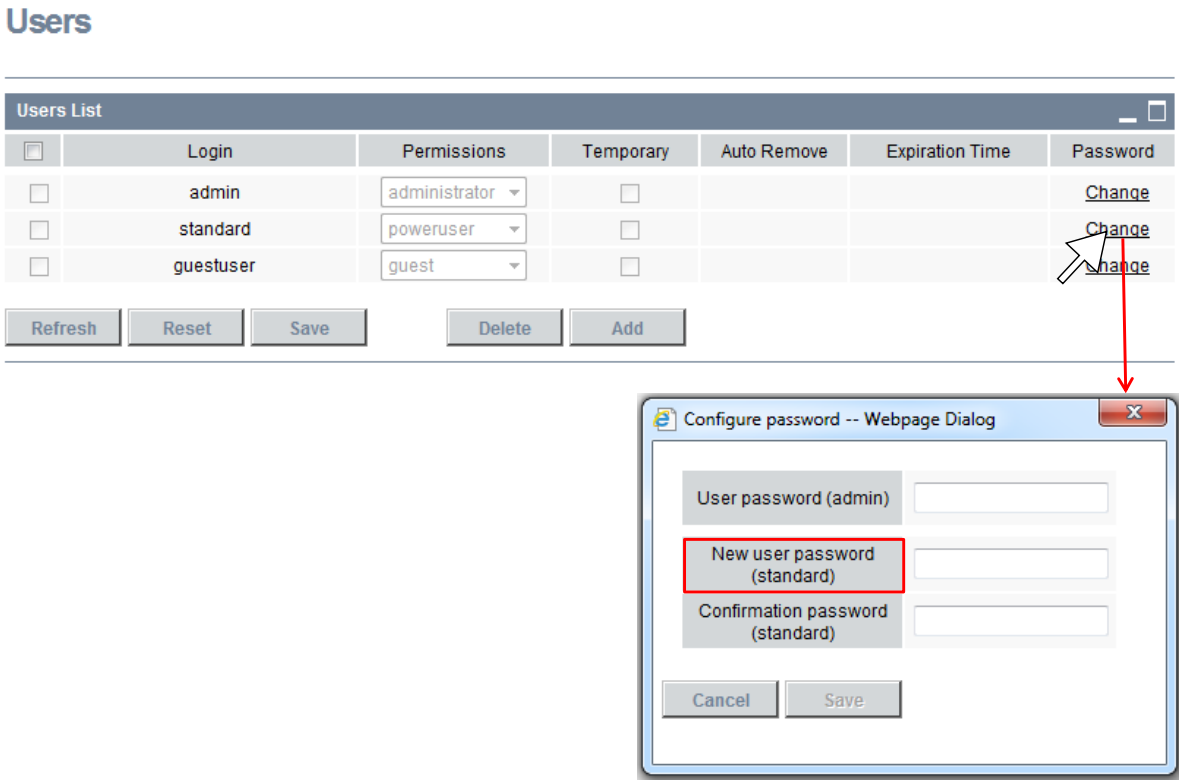
In the CLI section of this manual, the users' management related functionality is described section "users" node and subsections.

Figure 151.Menu Configuration Item Users



In the Change Password window it's possible for a user with administrator privileges to change the user password to access the system, for any user in the user's list which is used, Figure 152.

Figure 152. Change of user password by admin



Chapter 6
OPERATION

This chapter addresses the Operation of the equipment via local management.

OLT current configuration information is available via WEB TI configuration windows which show for each configurable item, the current OLT configuration

OLT current configuration information for a specific configurable OLT item can also be obtained via CLI application with the show, showconfig and availableValues commands at the configurable Item context, ie tree node, sub-node or branch.

Information on the status of OLT configured logical and physical elements and statistics can be obtained via WEBTI status menu items.

OLT status and statistics information for a specific configurable OLT item can also be obtained via CLI application with the “status” an “statistics” sub-nodes at the configurable Item context, ie tree node, sub-node or branch.

OLT alarms information can be obtained via WEBTI logs submenu alarms’ items.

Alarms information can also be obtained via CLI application node “logs” sub-node “alarms” commands.

UPGRADING TO A NEW OLT OS SOFTWARE RELEASE

DETERMINING THE SOFTWARE VERSION

You can verify your ME4600 OLT OS software version by checking the “Firmware version”;:

at the equipment WEBTI interface main window;

with CLI and the command /equipment/system/show;

UPGRADING TO A NEW SOFTWARE RELEASE

You can upgrade to a new software release for the ME4600 Series OLT OS either using NMS-NG NMS system or using a LCT and CLI.

OLT OS INSTALLATION PROCEDURE

Note:

In order to install OLT-OS, it is necessary to have 300MB free space available at the OLT switch fabric flash memory storage**.**

Step 1. Determine the Software Version you have installed on your OLT

You can verify your ME4600 OLT OS software version by checking the “Firmware version”;:

- at the equipment WEBTI interface main window;
- with CLI and the command /equipment/system/show;

Step 2. Download the desired ME4600 Series OLT OS version to perform upgrade of your OLT OS software from Cisco.com to an TFTP server.

Step 3. Login in the ME4600 OLT using CLI admin account credentials.

Step 4. Import the new ME4600 OLT-OS setup file using a TFTP client to the Local Craft Terminal, using the following command :

/applications/olt-upgrade/import

The IP address of the TFTP server and the the setup filename to import must be provided as mandatory parameters of the command. The path of the olt setupfile to import from the TFTP server can also be specified at the command line.

Step 5. Update the OLT OS with the imported setup file with the following command:

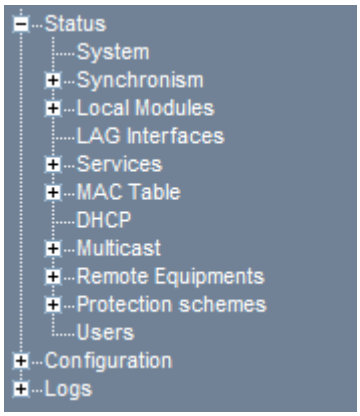
/applications/olt-upgrade/apply-file

Last imported setup file will be the one to be used by the engine to run the OS. After command execution system will reboot and restart using the new OS version.

STATUS

Status menu submenus and items provide information on the state of configured OLT elements and statistics.

Figure 153. Status menu



In CLI, status information is available at these sections

- “applications” node, subsection
    - “status” command (at firmware/files subnode)
- “cfm-probe” node, subsection
    - “status” command
- “equipment” node, subsection
    - “status” command
- “erp-ring” node, subsection:
    - “status” sub-node
- “mac-table” node, section:
    - “status” sub-node
- “interfaces” node, subsections:
    - “statistics” sub-node (at Ethernet subnode)
    - “statistics” sub-node (at Ethernet/services subnode)
    - “statistics” sub-node (at gpon subnode)
    - “statistics” sub-node (at lag subnode)
- “multicast” node, subsection:
    - “statistics” sub-node (at probes subnode)
- “remote-eq” node, subsection:

- "statistics" sub-node
- "statistics" sub-node"statistics" sub-node (at status/Ethernet subnode)
- "statistics" sub-node (at status/gemport subnode)
- "statistics" sub-node (at status/services subnode)

- "services" node, subsection:
  - "statistics" sub-node

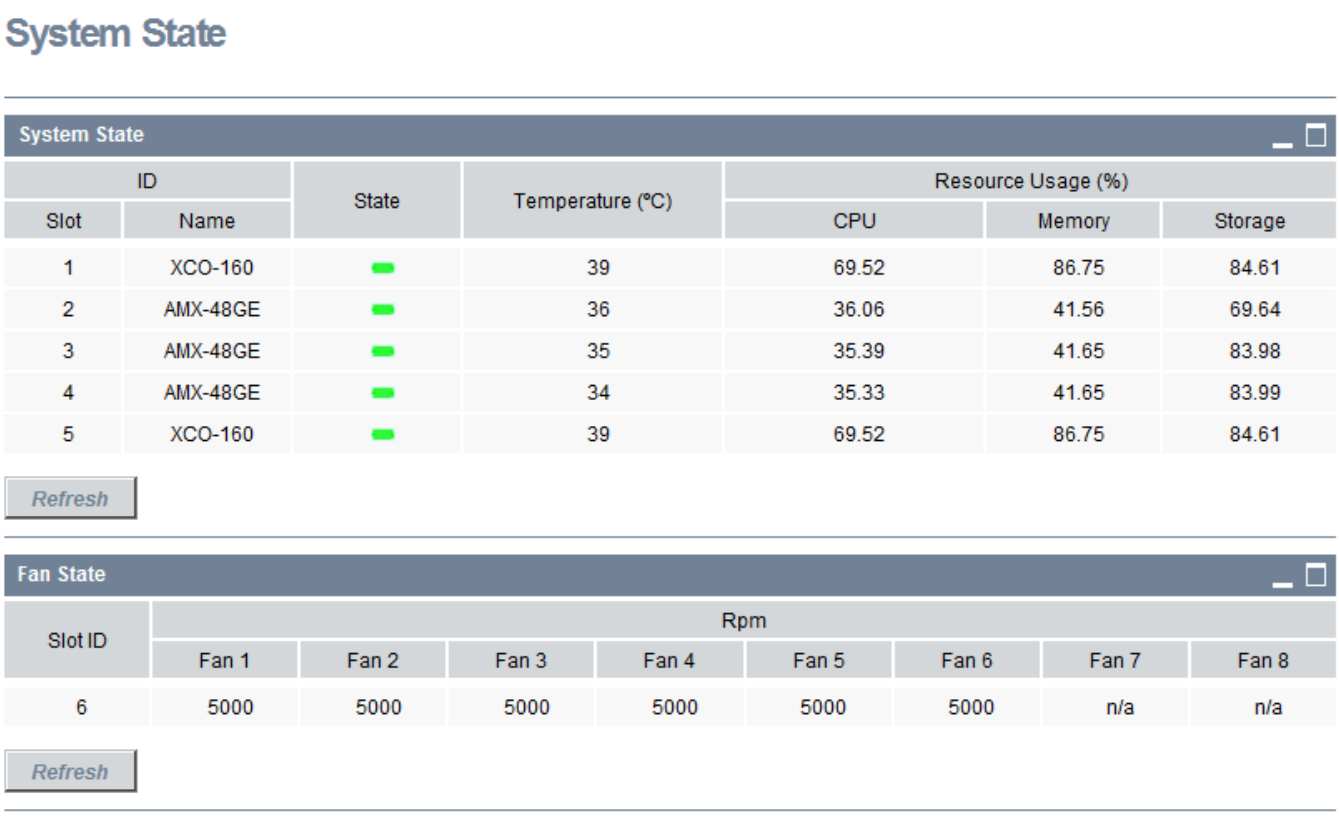
SYSTEM

Selection of status menu item "System" will open the System Status window, Figure 154, providing information related to the system boards.

This window is composed by two tables:

- System State;
- Fan Module.

Figure 154. OLT System State



The System State table is composed by the following parameters:

Table 98. System State parameters

Parameter	Description
Id	The Id column is composed by: **Slot**: Identifies the number of the slot **Name**: Identifies the kind of board inserted in the slot
State	Indicates the board state
Temperature	Indicates the board temperature (ºC)
Resource Usage	Indicates the resources in use (%): • CPU • Memory • Storage

The Fan State table is composed by the following parameters:

Table 99. Fan Module Status parameter table

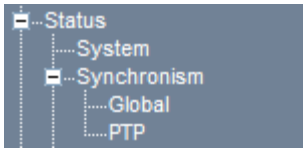
Parameter	Description
Slot Id	Indicates the Fan slot
RPM	Indicates the FAN number of rotations per minute for each fan in the module

SYNCHRONISM

The Synchronism status sub-menu has two items, Figure 155:

- Global
- PTP

Figure 155. Status submenu Synchronism



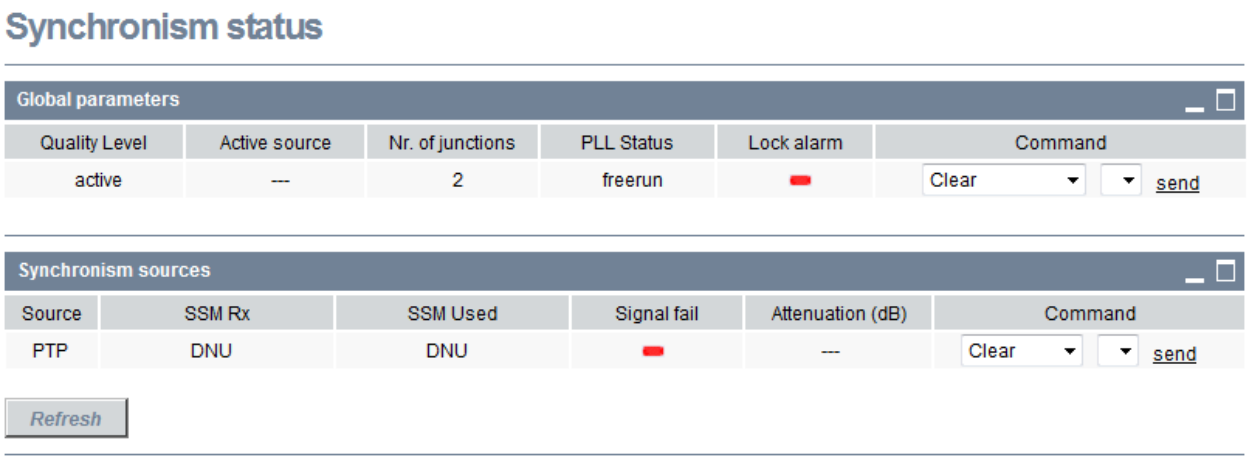
GLOBAL

Global menu item opens a Synchronism Status window that is composed by two tables, Figure 156:

- Global Parameter.
- Synchronism Sources

In the CLI section of this manual, the Synchronism Global status information is described in section, “global” sub-node “show” command.

Figure 156. Synchronism Status window



The Global parameters table is composed by the following parameters:

Table 100. Global Parameters

Parameter	Description
Quality level	May be enabled or disabled
Active Source	Synchronization source (slot or junction number) of the respective PLL;
PLL Status	Equipment system PLL is controlled by a state machine according to G.781 recommendation and can have one of the following status: **Hold Over**: The PLL will switch to this status if it ceases to be a valid synchronization source. This status provides a stable synchronization clock based on the original clock memorization; **Free Run**: The PLL is synchronized by the local clock; **Normal**: The PLL is synchronized by the programmed synchronization source
Lock alarm	This alarm is triggered when the PLL is not locked
Command	There are several external commands that are available to the user, for example for maintenance purposes commands. These commands are independent and have different impacts on the selection processes. Enabling and disabling external commands associated with the synchronization selection process is defined below. Only one of these external commands is enabled by the selection process at a time. It is possible to carry out the following commands in the active synchronism sources, by selecting the command in the combo box and clicking on send • **Clear** • **Manual Switch** • **Force Switch**

In the Synchronism Sources table, it possible to view the Physical interfaces that provide synchronism to the system which junctions are indicated in the Source column (in case of interfaces, the number of the slot to which the interfaces belongs is indicated)

Table 101. Synchronism Sources parameters

Parameter	Description
Source	Indicates synchronization source (slot or junction number)
SSM Rx	This column identifies the received SSM (Synchronization Status Message);
SSM Used	This column identifies the used SSM
Signal Fail	Signal failure of the respective synchronism source
Attenuation	Attenuation (measured in dB) associated with each of the existing synchronism junctions
Command	It is possible to temporarily remove a synchronism source attached to a selection procedure. This is controlled via the Lockout command. This command is accepted for synchronism sources enabled in each selection process. The lockout state of a disabled synchronism source is "off". However a synchronism source that is locked out, remains named for the selection process and maintains its priority. It is then possible to perform the following commands at the synchronism source level by selecting the command in the combo box and clicking on send • **Clear** • **Lockout**

Use of external Commands in Global parameters table and Synchronism sources table:

- **Clear** (at Synchronism Source table):

  The Clear command removes the Force Switch and Manual Switch commands (Global Parameters table), by turning "off" the Lockout state of a synchronism source. This allows synchronism source availability for selection process;

- **Lockout** (at Synchronism Source table):

  If the source is in "Lockout", the user will never be able to execute "Force Switch" or "Manual Switch" (Global Parameters table) for this source. This command turns "on" the Lockout status of a synchronism source. This allows synchronism source unavailability for selection process;

- **Manual Switch** (at Global Parameters table):

  Enables switching to the selected synchronism source if it has no failure.

  - This command selects one synchronism source by assuming it is enabled, is not Locked Out, is not in signal failure condition and has a QL (Quality Level) higher than the other synchronism sources and then the synchronism source with a DNU (Do Not Use) status in QL mode enabled. Otherwise, this command is automatically rejected.
  - Moreover, in the QL mode, manual switching may be performed only for the source that has the highest available QL. Thus, these conditions have the effect that a manual switch can only be used to override the priorities of the assigned synchronism sources. A request for manual switching overrides any other earlier request for manual switching.
  - This command is disabled using Clear command.

- **Force Switch** (at Global Parameters table):

  Causes switching to the selected synchronism source even if it has a failure.

  - This command can be used to implement the currently selected synchronism source, by assuming that the synchronism source is enabled and not in a Locked Up state. Otherwise, this command is automatically rejected.
  - This command overrides manual switching and another later Force Switch command overrides this.
  - This command is disabled by the Clear command.

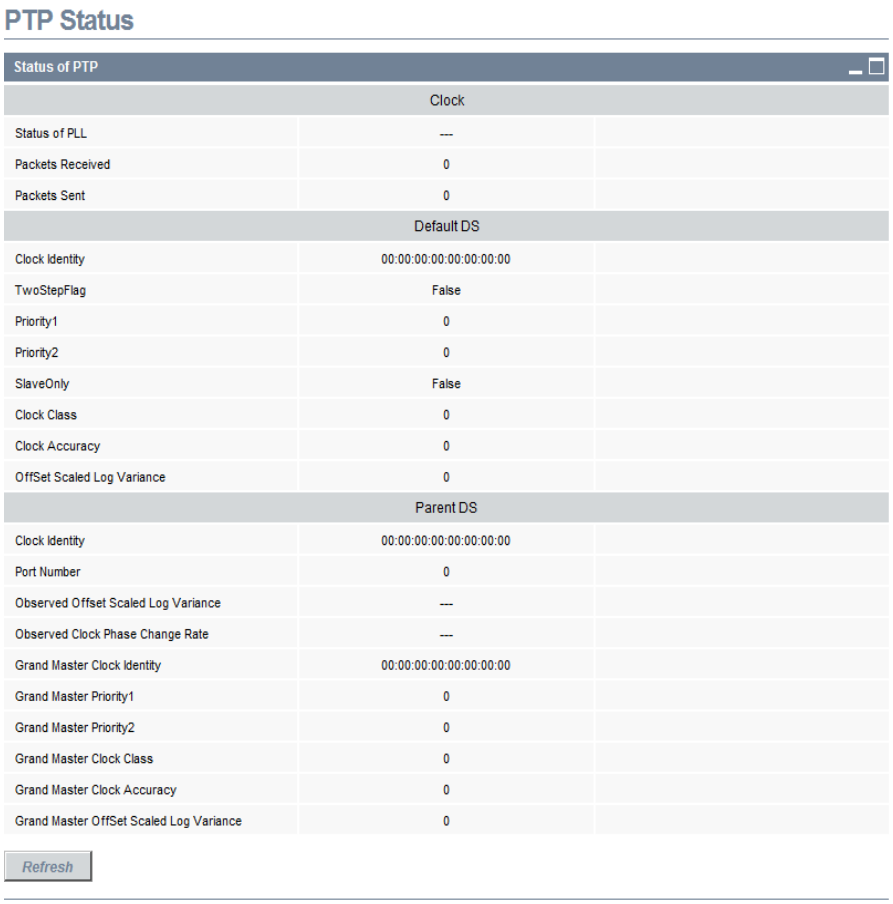
Important!

A Force Switch command sent to a synchronism source that has a Signal Fail status, or has a DNU QL mode enabled, will result in that network element entering an Holdover state**.**

PTP

In the CLI section of this manual, the Synchronism PTP status information is described in section“ptp” sub-node“show” command

Figure 157. PTP Status window



The PTP Status table is composed by the following parameters

Table 102. PTP parameters

Parameter Group	Parameter	Description
Clock	PLL Status	
	Packets Received	
	Packets Sent	
Default DS	Clock Identity	

	TwoStepFlag	Two-step clock configuration of the PTP machine (enable|disable)
	Priority 1	Override criteria for best master clock selection (1..253)
	Priority 2	Particular switch priority when criteria matches (1..253)
	SlaveOnly	Slave only configuration of the PTP machine (enable|disable)
	Clock Class	Default clock Quality class(0..255)
	Clock Accuracy	Clock Quality accuracy type
	OffSet Scaled Log Variance	
Parent DS	**Clock Identity**	
	Port Number	
	Observed OffSet Scaled Log Variance	
	Observed Clock Phase Change Rate	
	Grand Master Clock Identity	
	Grand Master Priority 1	Override criteria for best master clock selection (1..253)
	Grand Master Priority 2	Particular switch priority when criteria matches (1..253)
	Grand Master Clock Class	Default clock Quality class(0..255)
	Grand Master Clock Accuracy	Clock Quality accuracy type
	Grand Master Observed OffSet Scaled Log Variance	

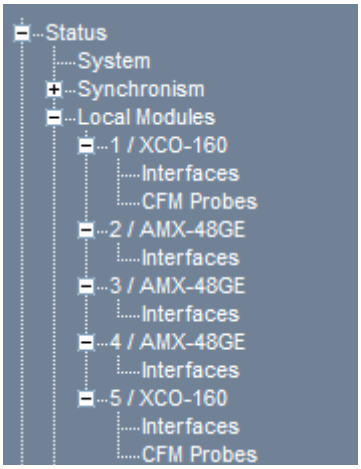
LOCAL MODULES

The local modules sub-menu has as many items as the line cards in the system (uplink Line Cards and Tributary Line Cards) up to number of line cards usable slots in the system (3 slots)

Each item of this sub-menu is identified by the pair Slot Nr / Inserted Line Card Designation, as an example 3/AMX-16GPON – Tributary Line card AMX-16GPON inserted in Slot Nr 3, Figure 158.

- In the CLI section of this manual, local modules status is described in“interfaces” node , subsections
    - “status” sub-node (Gpon interfaces)
    - “status” sub-node (lag interfaces),
    - “status” sub-node (RF overlay interfaces)
    - and “status” sub-node (Ethernet interfaces)

Figure 158. Local Modules Status Sub-menu



XCO-160

XCO-160 is the switch fabric and uplink line card.

Slot#/XCO-160 status/local modules Sub-menu is composed of two items, Figure 158:

- Interfaces
- CFM Probes

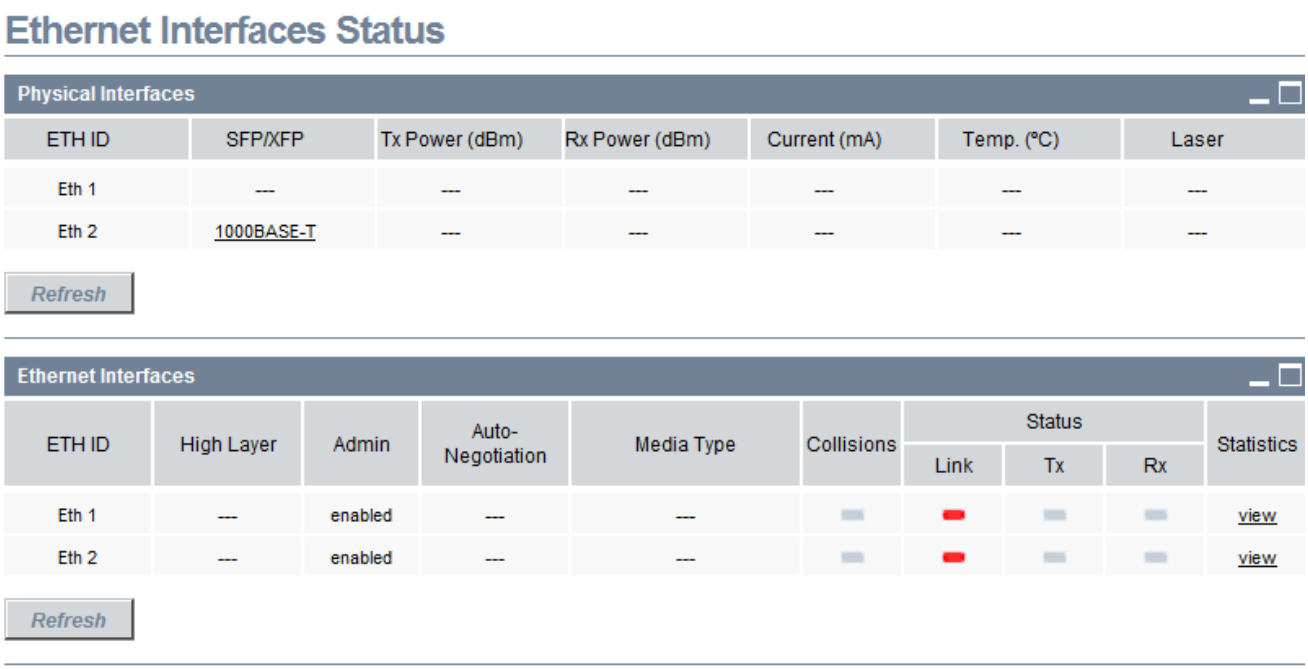
XCO-160:: INTERFACES

The selection of Interfaces item opens an Ethernet Interface Status window composed by the following tables:

- Physical Interfaces
- Ethernet Interfaces

In the CLI section of this manual, the Ethernet interfaces status information is described in “status” sub-node (Ethernet interfaces).

Figure 159. Ethernet Interfaces Status



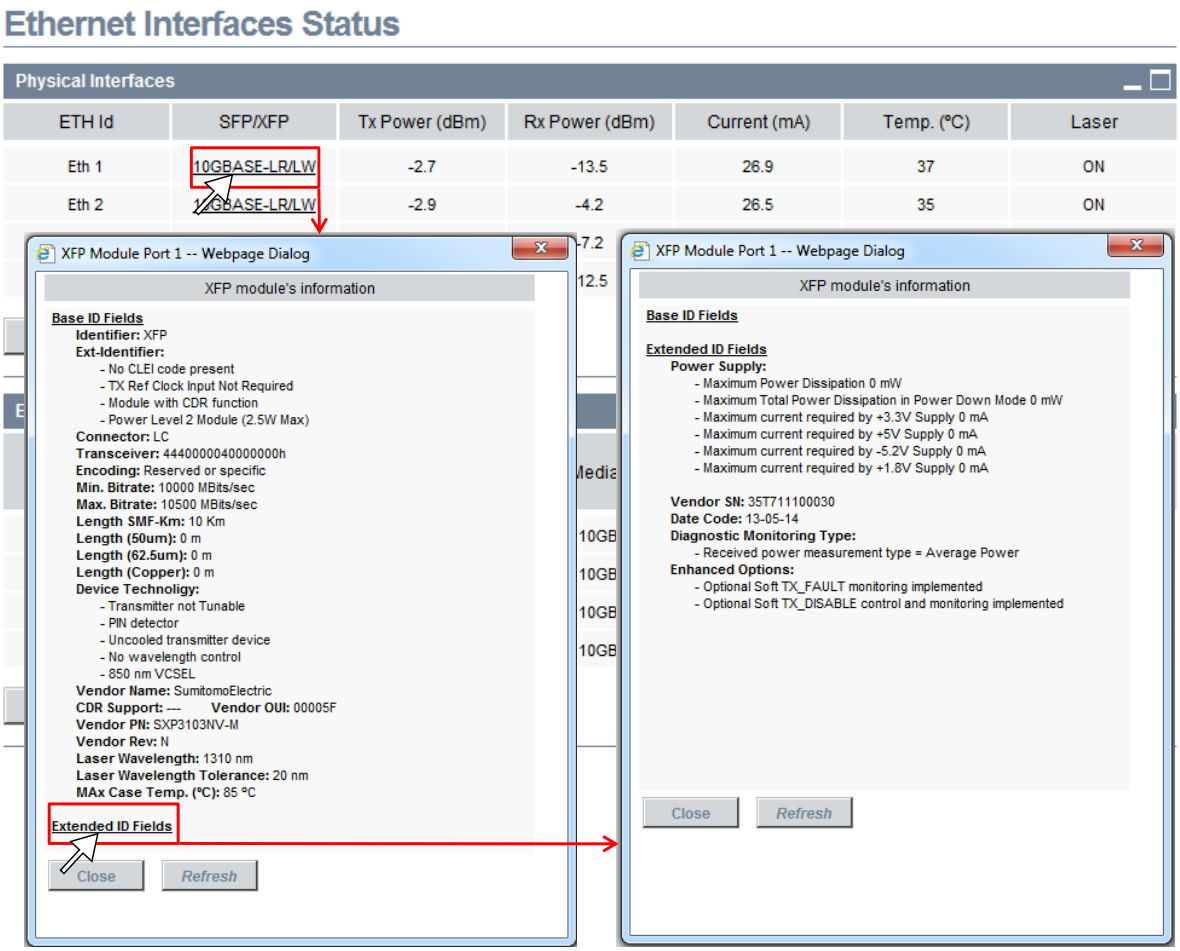
Passing the mouse over the inserted SFP/XFP module identification displays module standard information (bitrate, range and wavelength).

The Physical Interfaces Status table is composed by the following parameters:

Table 103. Physical Interfaces Status parameters table

Parameter	Description
Eth Id	Ethernet Interface identifier
SFP/XFP	SFP/XFP module. By pressing the SFP/XFP module it's possible to view the SFP/XFP detailed information (Figure 160)
Tx Power (dBm)	Indicates the transmitted optical power in dBm
Rx Power (dBm)	Indicates the received optical power in dBm
Current (mA)	Indicates the laser BIAS current in mA
Temp. (ºC)	Indicates the XFP module temperature in ºC
Laser	Indicates the Laser operational States

Figure 160. SFP/XFP module Detailed Information

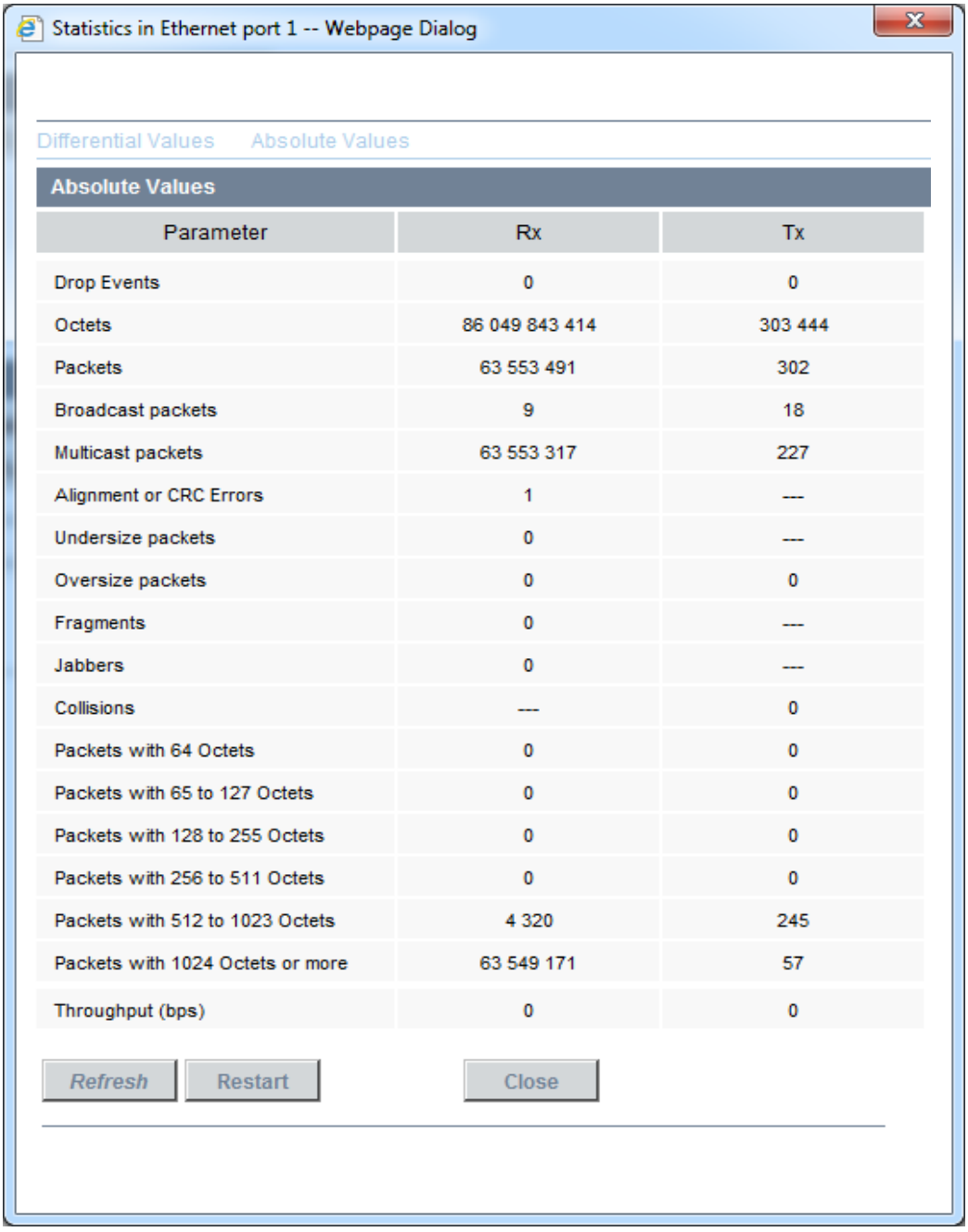


The Ethernet Interfaces Status table, Figure 159, is composed by the following parameters:

Table 104. Ethernet Interfaces Status parameters table

Parameter	Description
Eth Id	Ethernet Interface identifier
High Layer	Indicates to each LAG (in case the port is a LAG member) the port belongs to
Admin	Ethernet port Administrative State
Auto-Negotiation	If the port is configured to Auto negotiation, indicates the Auto Negotiation State
Media Type	Indicates the Link Speed
Collisions	Not applicable in Full Duplex interfaces
Status	It's composed by the following columns: **Link:** Indicates the Link State **Tx:** Indicates if the interface is transmitting packets **Rx**: Indicates if the interface is receiving packets
Statistics	By pressing view, a window with the port statistics according with RFC2819 will open, Figure 161. Differential and absolute values' statistics are available.

Figure 161.Ethernet Port Statistics



The Ethernet Port Statistics table is composed by the following parameters:

Table 105. Ethernet Port Statistics parameters table

Parameter	Description
Drop Events	Number of dropped packets
Octets	Number of bytes
Packets	Number of Packets
Broadcast Packets	Number of Broadcast Packets
Multicast Packets	Number of Multicast Packets
Alignment of CRC Errors	Number of packets with wrong FCS (Frame Check Sequence)
Undersize Packets	Number of packets with size less than 64 bytes
Oversize Packets	Number of packets with size over than 1518 bytes
Fragments	Number of packets with size less than 64 bytes and with wrong FCS (Frame Check Sequence)
Jabbers	Number of packets with size over than 1518 bytes and with wrong FCS (Frame Check Sequence)
Collisions	Number of collisions in the Ethernet Segment (only in Half Duplex)
Packets with 64 Octets	Number of 64 bytes packets
Packets with 65 to127 Octets	Number of packets with size between 65 to 127 bytes
Packets with 128 to 255 Octets	Number of packets with size between 128 to 255 bytes
Packets with 256 to 511 Octets	Number of packets with size between 256 to 511 bytes
Packets with 512 to 1023 Octets	Number of packets with size between 512 to 1023 bytes
Packets with 1024 to 1518 Octets	Number of packets with size between 1024 to 1518 bytes
Throughput (bps)	Indicates approximately the received and transmitted bit rate (1Mbit/s Granularity)

In the CLI section of this manual, the Ethernet interface statistics information is described in “statistics” sub-node (at Ethernet subnode).

XC0-160:: CFM PROBES

The selection of CFM Probes item opens an Ethernet Interface Status window composed by the following tables:

- CFM probes list
- Latest Logs of Unexpected CCM Packets

Figure 162. CFM Status/XCO-160 window

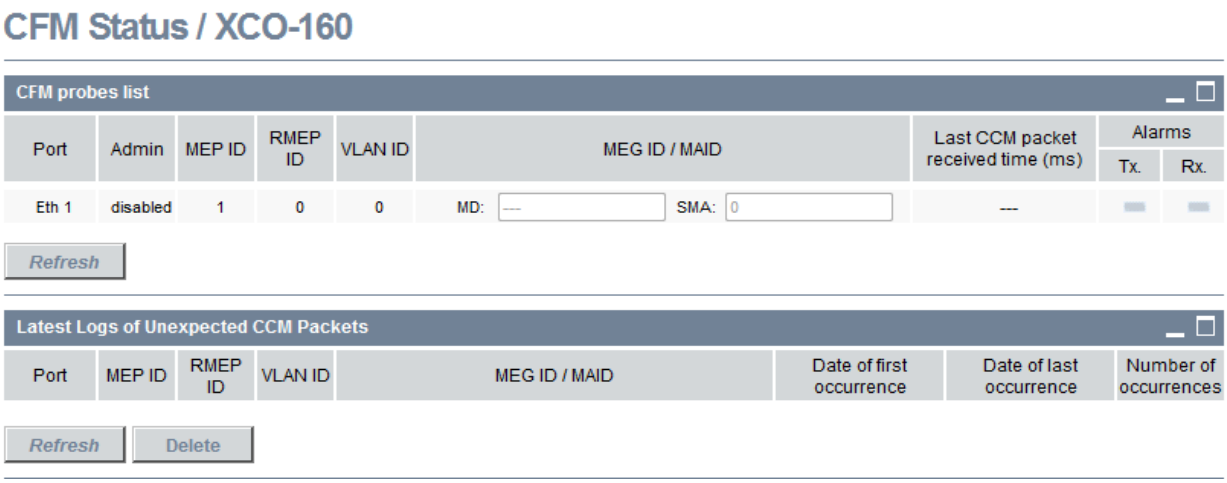


Table 106. CFM probes list parameters

Parameter	Description
Port	Physical interface that the probe is monitoring
Admin	Probe Administrative State: Enable/disable
MEP ID	MEP Identification forwarded by the probe in the CCM message
RMEP ID	MEP ID of the remote MEP with which this probe makes P2P
VLAN ID	VLAN that encapsulates the CCM frame sent by the probe
MEG ID /MAID	Identification of the CFM maintenance group: **MD:** Maintenance Domain Id **SMA:** Short Maintenance Association Name
Last CCM packet receive time (ms)	Instant of time of arrival of last received CCM packet
Alarms	**Tx:** This alarms triggers when no packets are transmitted **Rx**: This alarms triggers when no packets are received

Table 107. Latest Logs of Unexpected CCM Packets table parameters

Parameter	Description
Port	Physical interface that the probe is monitoring
MEP ID	MEP Identification forwarded by the probe in the CCM message
RMEP ID	MEP ID of the remote MEP with which this probe makes P2P
VLAN ID	VLAN that encapsulates the CCM frame sent by the probe
MEG ID /MAID	Identification of the CFM maintenance group: **MD:** Maintenance Domain Id **SMA:** Short Maintenance Association Name
Date of first occurrence	Date of first Unexpected CCM Packet type occurrence
Date of last occurrence	Date of last Unexpected CCM Packet type occurrence

Number of occurrences	Number of Unexpected CCM Packet type occurrences

In the CLI section of this manual, the CFM probes information is described in section“cfm-probe” node, subsection “status” command

AMX-16GPON

AMX-16GPON is a Tributary GPON line card. Selected Slot#/AMX-16GPON ITEM of status/local modules Sub-MENU opens PON Interface Status / AMX-16GPON window.

The PON Interface Status / AMX-16GPON window is composed by the following tables:

- Physical Interfaces
- PON Interfaces

In the CLI section of this manual, the GPON interfaces status information is described in section “status” sub-node (Gpon interfaces).

Figure 163. GPON Physical Interfaces Status

PON Interface Status / AMX-16GPON

Physical Interfaces

PON Id	SFP	Tx Power (dBm)	Rx Power (dBm)	Current (mA)	Temp. (°C)	Laser	Alarms
PON 1	---	---	---	---	---	---	
PON 2	---	---	---	---	---	---	
PON 3	LTE3680M-BH	3.5	view	16.2	42	ON	
PON 4	---	---	---	---	---	---	
PON 5	---	---	---	---	---	---	
PON 6	---	---	---	---	---	---	
PON 7	LTE3680M-BH	3.6	view	17.4	41	ON	
PON 8	---	---	---	---	---	---	
PON 9	---	---	---	---	---	---	
PON 10	---	---	---	---	---	---	
PON 11	---	---	---	---	---	---	
PON 12	---	---	---	---	---	---	
PON 13	---	---	---	---	---	---	
PON 14	---	---	---	---	---	---	
PON 15	---	---	---	---	---	---	
PON 16	GPON Class B+	3.5	view	9.6	32	ON	

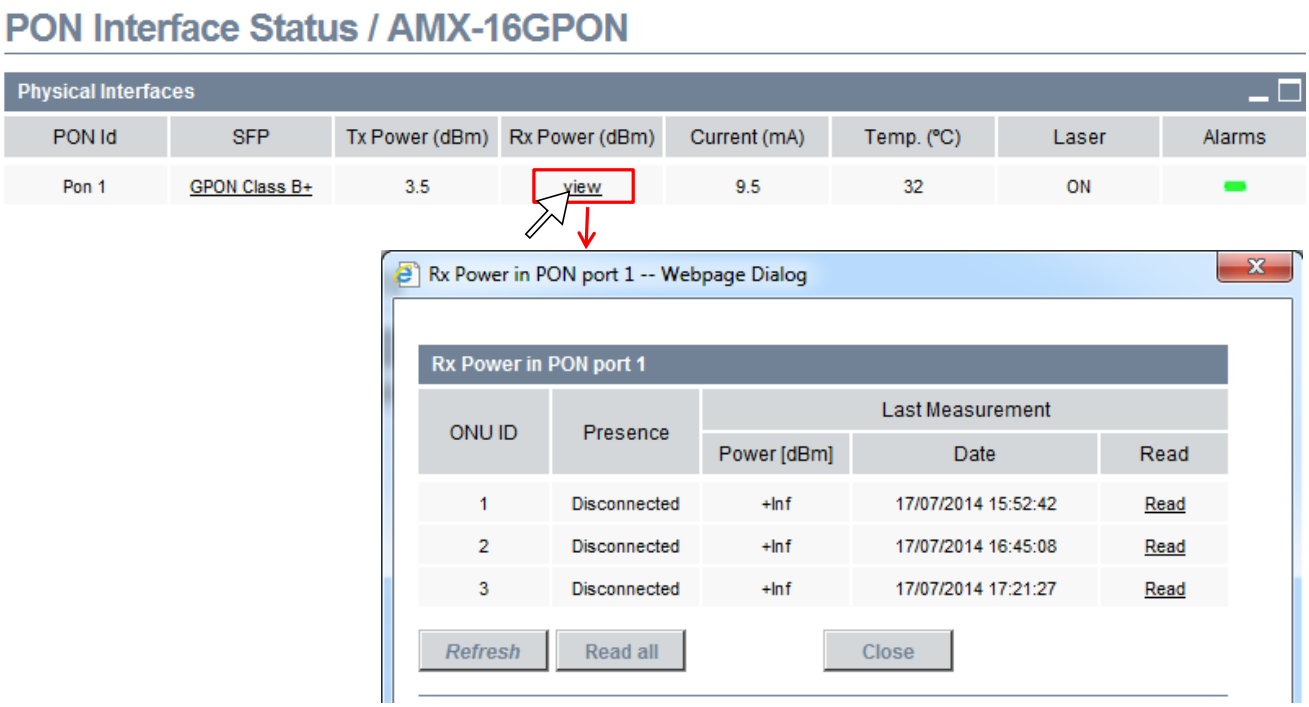
Refresh

The Physical Interfaces Status table, Figure 163, is composed by the following parameters:

Table 108. Physical Interfaces Status parameters

Parameter	Description
PON Id	PON Interface identifier
SFP	SFP module. By pressing the SFP module it's possible to view the SFP detailed information (Figure 166)
Tx Power (dBm)	Indicates the transmitted optical power in dBm
Rx Power (dBm)	By pressing view the window will open, Figure 164 and it's possible to visualize the received optical power from each ONT
Current (mA)	Indicates the laser BIAS current in mA
Temp. (ºC)	Indicates the SFP module temperature in ºC
Laser	Indicates the Laser operational States
Alarms	Indicates the SFP Alarms

Figure 164. GPON Interface received power



The GPON interface received optical power table, Figure 164, is composed by the following parameters:

Table 109. GPON interface received optical power parameters

Parameter	Description
ONU ID	ONU identifier
Presence	Indicates the presence or absence of the ONU
Last Mesurement	Indiactes last measuremt of Rx power on the PON port • **Power (dBm)** - Optical power received from an ONT in a certain instant in dBm, in case the value is (0.0)*

	means that the ONU is in absent state • **Date**- Time when the measurement was made • **Read** – By pressing the Read link, a new measurement for that ONU will be made

Important!

Since the Received Optical Power measurement is slow, the user has the possibility to start a measurement for all ONU's by pressing the "Read All" button.

Passing the mouse over the inserted SFP module identification displays module standard information, Figure 165, in the example information for the standard GPON class B+ is displayed (bitrate, range and wavelength).

Figure 165. SFP Standard information

Selecting the SFP module identification opens a window, Base ID fields, with detailed module information, Figure 166. By selecting the links in the bottom of the window, Extended ID Fields, /AD Status Bits / Base ID fields toggles the information displayed on the window corresponding to the selected link.

Figure 166. SFP Module detailed information

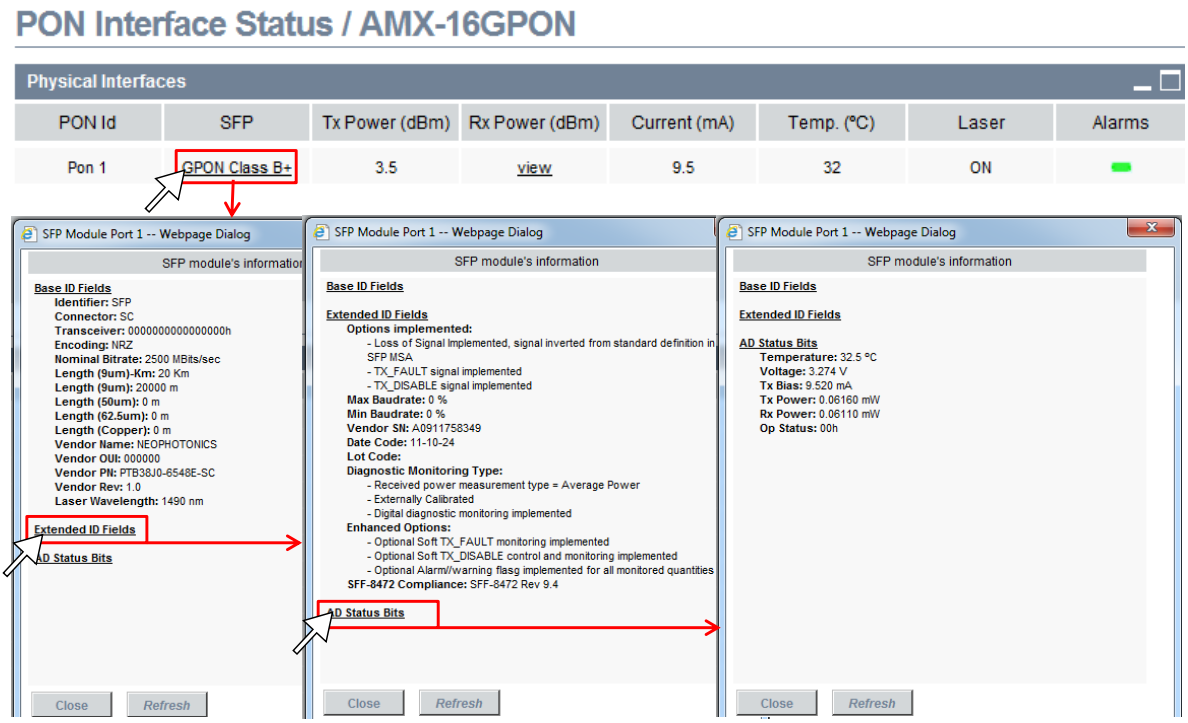
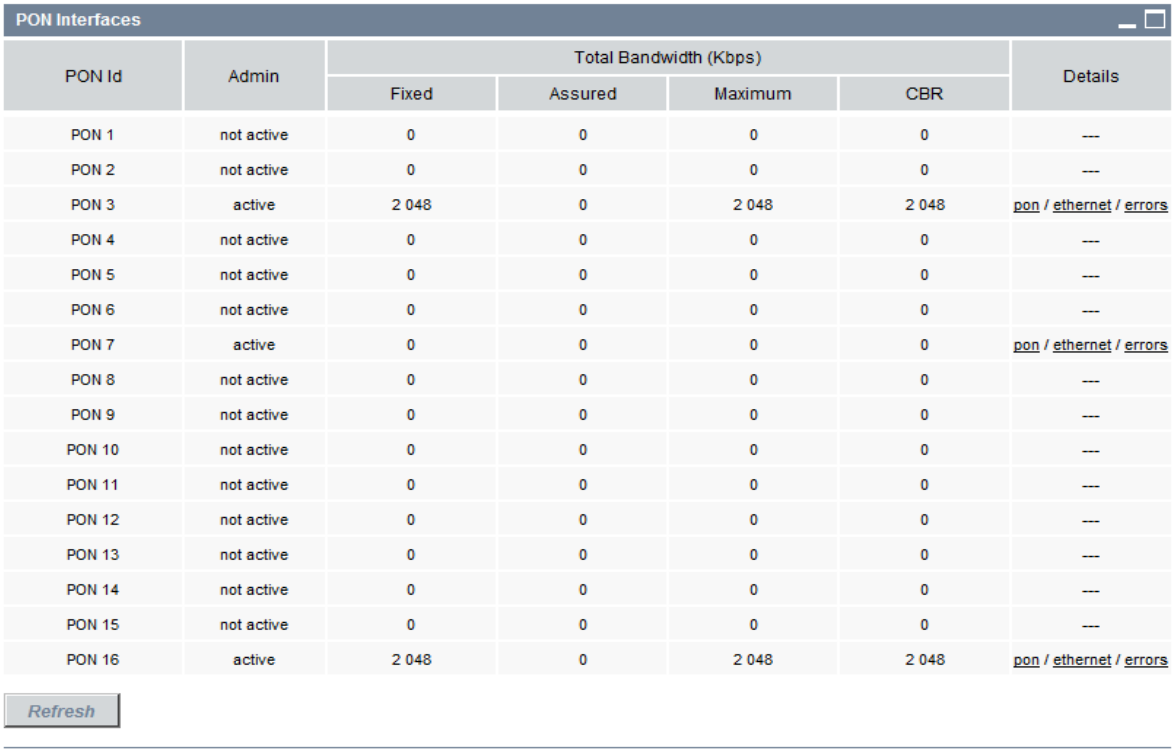


Figure 167. GPON Interfaces Status



PON Interfaces

PON Id	Admin	Total Bandwidth (Kbps)				Details
		Fixed	Assured	Maximum	CBR	
PON 1	not active	0	0	0	0	---
PON 2	not active	0	0	0	0	---
PON 3	active	2 048	0	2 048	2 048	pon / ethernet / errors
PON 4	not active	0	0	0	0	---
PON 5	not active	0	0	0	0	---
PON 6	not active	0	0	0	0	---
PON 7	active	0	0	0	0	pon / ethernet / errors
PON 8	not active	0	0	0	0	---
PON 9	not active	0	0	0	0	---
PON 10	not active	0	0	0	0	---
PON 11	not active	0	0	0	0	---
PON 12	not active	0	0	0	0	---
PON 13	not active	0	0	0	0	---
PON 14	not active	0	0	0	0	---
PON 15	not active	0	0	0	0	---
PON 16	active	2 048	0	2 048	2 048	pon / ethernet / errors

Refresh

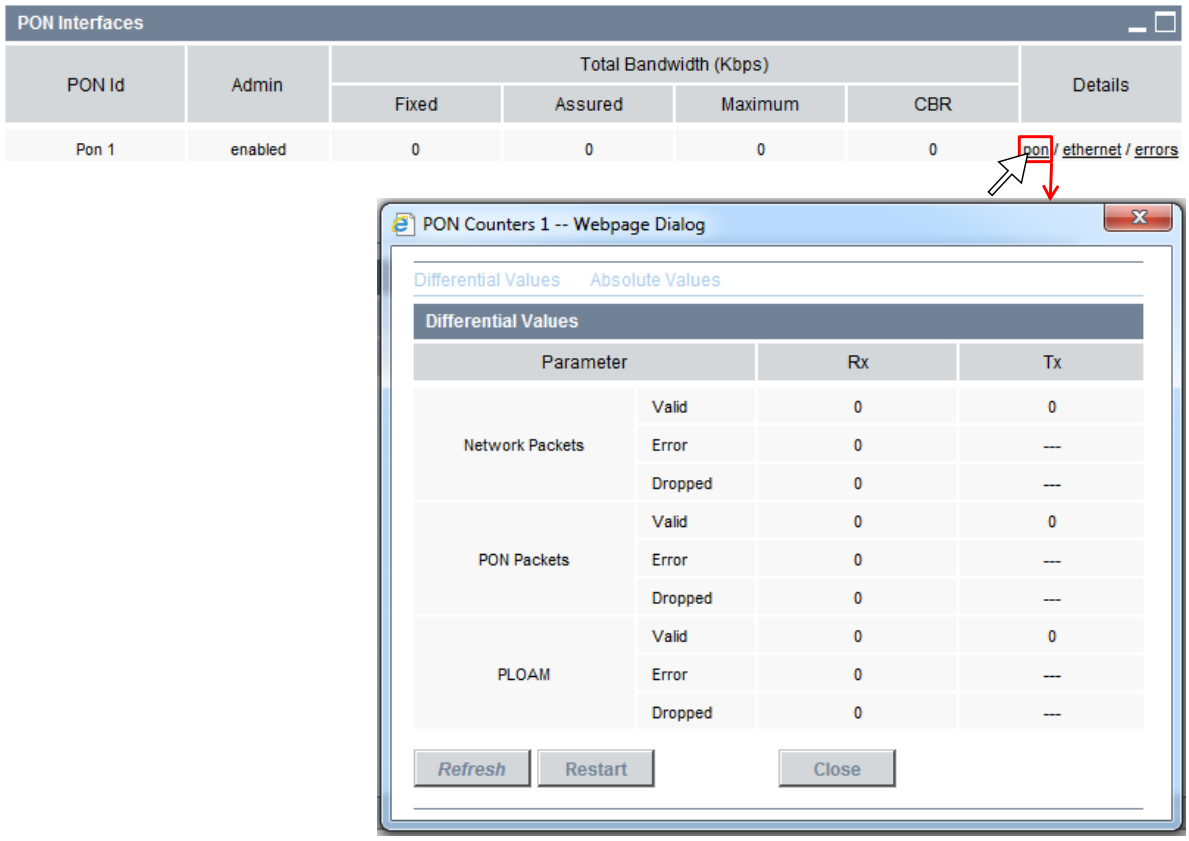
The GPON interface status table is composed by the following parameters:

Table 110-. GPON interface status parameters

Parameter	Description
PON Id	GPON interface identifier
Admin	GPON interface administrative state
Total Bandwidth (Kbps)	Indicates the GPON Interface allocated bandwidth: **Fixed:** Fixed Bandwidth (must be less than 1,2Gb/s) **Assured**: Assured Bandwidth (must be less than 1,2Gb/s) **Maximum**: Maximum Bandwidth **CBR**: CBR Fixed Bandwidth (must be less than 480Mb/s) (**Note**: Fixed plus Assured bandwidth must be less than 1,2Gb/s)
Details	By pressing in the pon, Ethernet and errors, a window with the respective counters will open

By pressing the pon link the following window will open.

Figure 168. GPON counters



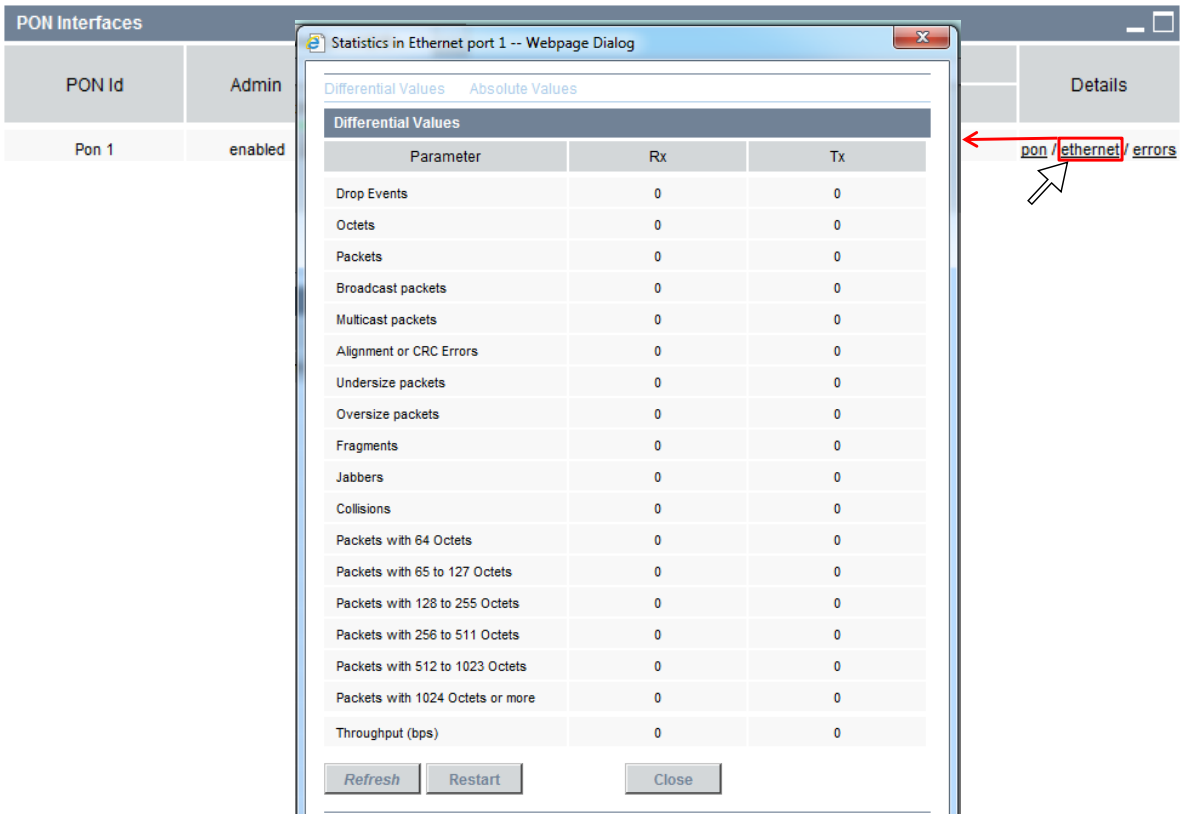
The GPON counters table is composed by the following parameters:

Table 111. GPON counters parameters

Parameter	Description
Network Packets	In this parameter is possible to check the GPON valid/error/dropped received/transmitted packets from/to the network
PON Packets	In this parameter is possible to check the GPON valid/error/dropped received/transmitted packets from/to the GPON
PLOAM	In this parameter is possible to check the GPON valid/error/dropped received/transmitted PLOAM packets from/to the network

By pressing the ethernet link the following window will open:

Figure 169. Ethernet Counters



The Ethernet Statistics table is composed by the following parameters:

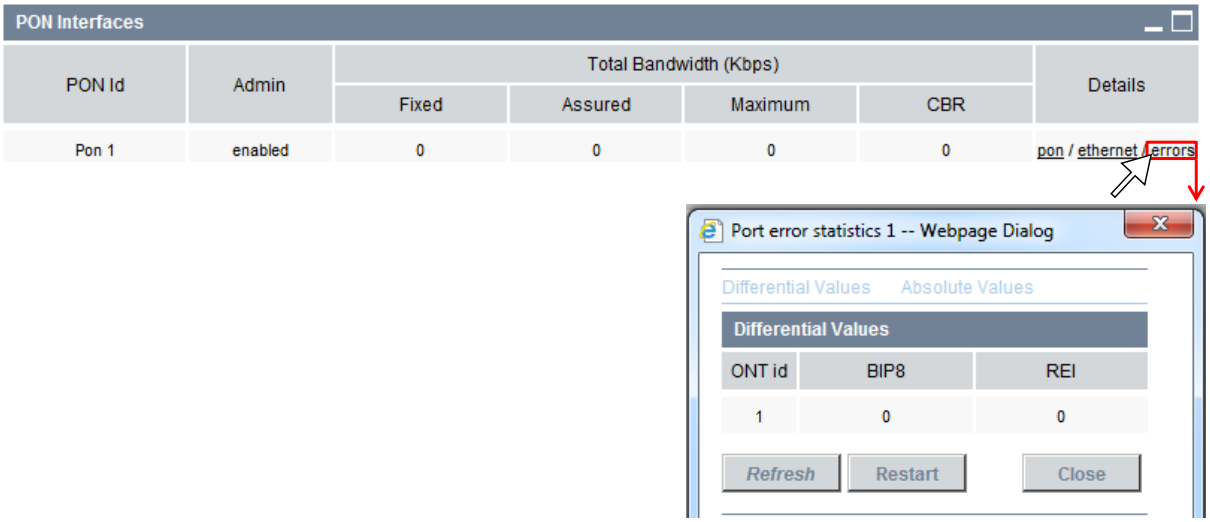
Table 112. Ethernet Statistics parameters

Parameter	Description
Drop Events	Number of dropped packets
Octets	Number of bytes
Packets	Number of Packets
Broadcast Packets	Number of Broadcast Packets
Multicast Packets	Number of Multicast Packets
Alignment or CRC Align Errors	Number of packets with wrong FCS (Frame Check Sequence)
Undersize Packets	Number of packets with size less than 64 bytes
Oversize Packets	Number of packets with size over than 1518 bytes
Fragments	Number of packets with size less than 64 bytes and with wrong FCS (Frame Check Sequence)
Jabbers	Number of packets with size over than 1518 bytes and with wrong FCS (Frame Check Sequence)
Collisions	Number of collisions in the Ethernet Segment (only in Half Duplex)
Packets with 64 Octets	Number of 64 bytes packets
Packets with 65 to 127 Octets	Number of packets with size between 65 to 127 bytes

Packets with 128 to 255 Octets	Number of packets with size between 128 to 255 bytes
Packets with 256 to 511 Octets	Number of packets with size between 256 to 511 bytes
Packets with 512 to 1023 Octets	Number of packets with size between 512 to 1023 bytes
Packets with 1024 to 1518 Octets	Number of packets with size between 1024 to 1518 bytes
Throughput (bps)	Indicates approximately the received and transmitted bit rate (1Mbit/s Granularity)

By pressing the errors link the following window will open:

Figure 170. Port error statistics



The Port error statistics table is composed by the following parameters:

Table 113. Port error statistics parameters

Parameter	Description
ONT id	ONT identifier
BIP8	Errors received by the OLT for each of the ONT's(upstream direction)
REI	Errors received by each of the ONT's(downstream direction)

In the CLI section of this manual, the GPON interface statistics information is described in section "statistics" sub-node (at gpon subnode).

AMX-48GE

AMX-48GE is an Active Ethernet line card.

Slot#/AMX-48GE status/local modules Sub-menu is composed of two items, Figure 158:

- Interfaces
- CFM Probes

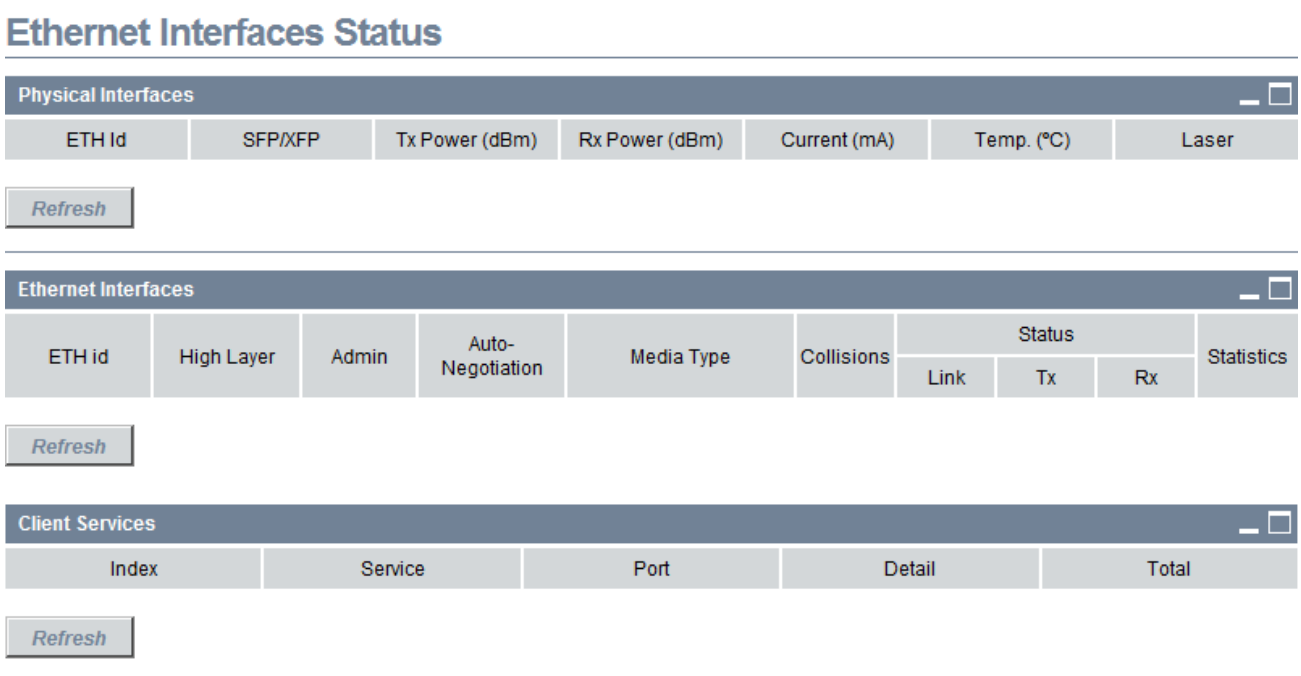
AMX-48GE:: INTERFACES

The selection of Interfaces item opens an Ethernet Interface Status window composed by the following tables:

- Physical Interfaces
- Ethernet Interfaces
- Client Service

In the CLI section of this manual, the Ethernet interfaces status information is described in section “status” sub-node (Ethernet interfaces).

Figure 171. Ethernet Interfaces Status



The Physical Interfaces Status table is composed by the following parameters:

Table 114. Physical Interfaces Status parameters table

Parameter	Description
Eth Id	Ethernet Interface identifier
SFP/XFP	SFP/XFP module. By pressing the SFP/XFP module it's possible to view the SFP/XFP detailed information
Tx Power (dBm)	Indicates the transmitted optical power in dBm
Rx Power (dBm)	Indicates the received optical power in dBm
Current (mA)	Indicates the laser BIAS current in mA
Temp. (ºC)	Indicates the XFP module temperature in ºC
Laser	Indicates the Laser operational States

The Ethernet Interfaces Status table, is composed by the following parameters:

Table 115. Ethernet Interfaces Status parameters table

Parameter	Description
Eth Id	Ethernet Interface identifier
High Layer	Indicates to each LAG (in case the port is a LAG member) the port belongs to
Admin	Ethernet port Administrative State
Auto-Negotiation	If the port is configured to Auto negotiation, indicates the Auto Negotiation State
Media Type	Indicates the Link Speed
Collisions	Not applicable in Full Duplex interfaces
Status	It's composed by the following columns: **Link:** Indicates the Link State **Tx:** Indicates if the interface is transmitting packets **Rx**: Indicates if the interface is receiving packets
Statistics	By pressing view, a window with the port statistics according with RFC2819 will open, Figure 161. Differential and absolute values' statistics are available.

The Client Services Status table, is composed by the following parameters:

Table 116. Client Services Status parameters table

Parameter	Description
Index	Client Service Id (number)
Service	Client Service Id (name)
Detail	By pressing view a window will open with detailed information on the client service statistics according with RFC2819 will open. Differential and absolute values' statistics are available.
Total	Activate

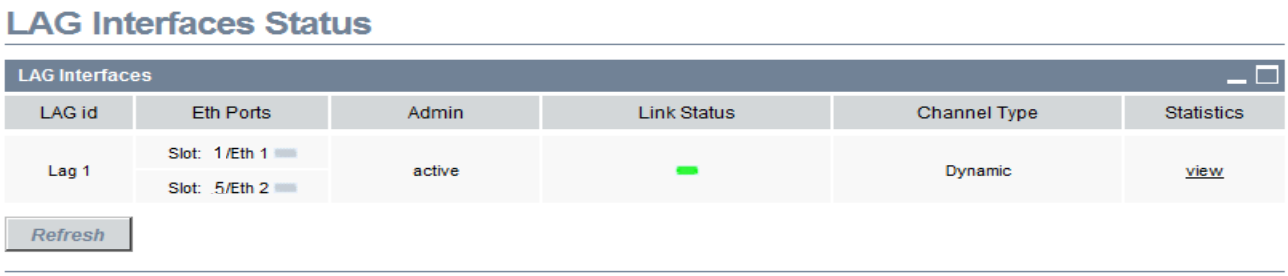
In the CLI section of this manual, the Ethernet interface statistics information is described in section "statistics" sub-node (at Ethernet/services subnode).

LAG INTERFACES

In the CLI section of this manual, the LAG interfaces status information is described in Sub-node “status”

The selection of Status menu item LAG Interfaces opens a LAG interfaces Status window, Figure 172, where it is possible to check the LAG and each LAG member status.

Figure 172. LAG interfaces status

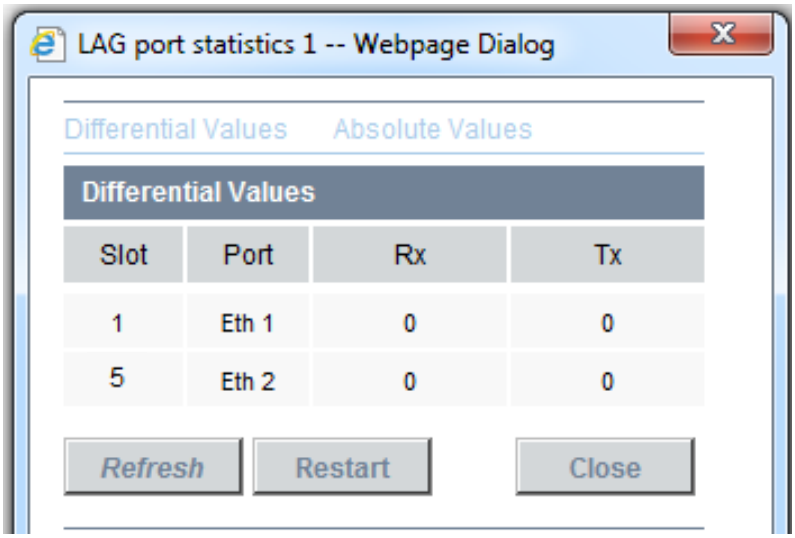


The LAG interfaces Status table is composed by the following parameters:

Table 117.LAG interfaces Status parameters

Parameter	Description
Lag id	Indicates the LAG identifier
Eth Ports	Indicates the Ports that belong to the LAG. In case the port is red, it is in the collecting state. In case the port is green, it is in the distributing state.
Admin	Indicates the LAG Administrative State
Link Status	If at least one of the LAG members is up, the Link status is green, otherwise it’s red.
Channel Type	Indicates if the LAG is Static, in this case it doesn’t process or send LACPDU’s, or it’s Dynamic, in this case it processes and send’s LACPDU’s
Statistics	By pressing view a window with the transmitted and received packets by each interface will open (Figure 173)

Figure 173. LAG port statistics



The LAG Port Statistics table is composed by the following parameters:

Table 118. LAG Port Statistics parameters

Parameter	Description
Slot	Identifies the slot to where the card to which the Port belongs is inserted
Port	Indicates the LAG member
Rx	Indicates the number of LACPDU's received
Tx	Indicates the number of LACPDU's transmitted

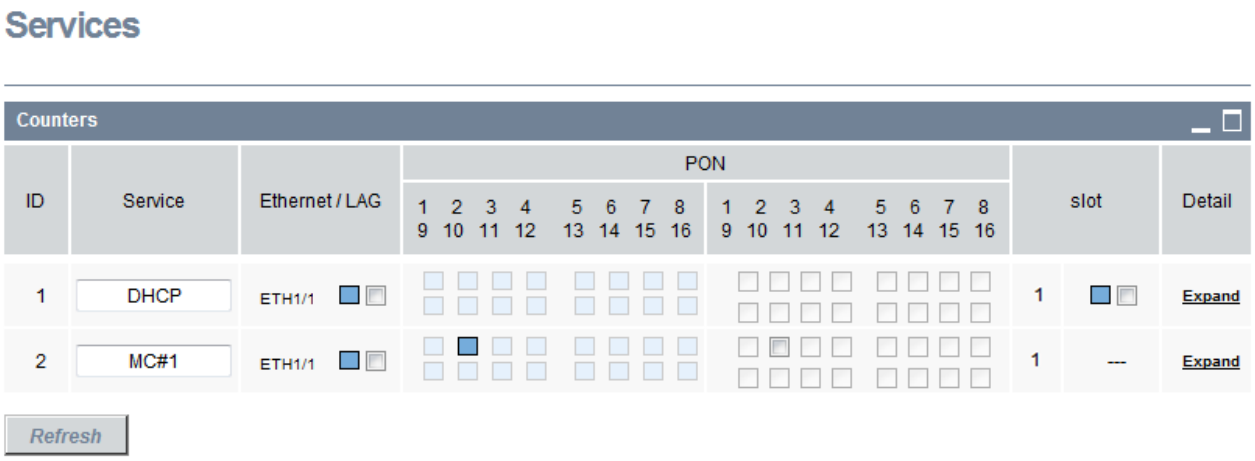
In the CLI section of this manual, the LAG interface statistics information is described in section "statistics" sub-node (at lag subnode).

SERVICES

The Services Status sub-menu has one item, Statistics. The selection of Statistics item opens a window, Figure 174, with service counters table:

In the CLI section of this manual, the Services status information is described in section "services"node, subsection, "statistics" sub-node.

Figure 174. Services Counters window

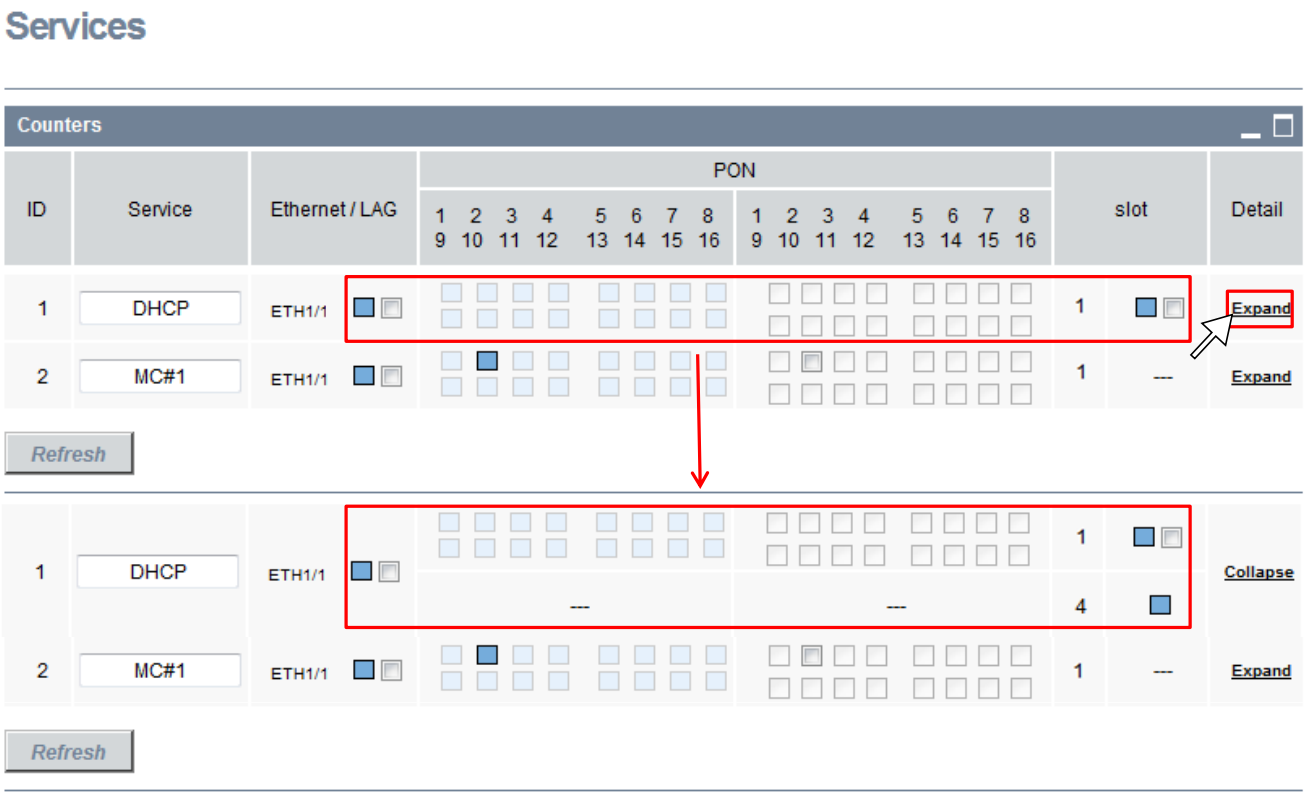


The Services Counters table is composed by the following parameters:

Table 119. Services Counters parameters table

Parameter	Description
ID	Indicates the service Identification number
Service	Indicates the service name
Ethernet/LAG	Indicates Ethernet(ETH number/Slot pair) or LAG interface. By pressing the counter for that specific interface is activated, by pressing the it's possible to view service specific counters; If the counter is activated, , both differential and absolute counter values are available, and can be displayed by pressing the Differential values or Absolute values in the counters dialog box, otherwise only differential values are available. The type of show counter information depends on the type of service. If the Service is of Type Multicast IGMP Counters are available.
PON	By pressing the counter for that specific PON port is activated, by pressing the it's possible to view service specific counters. If the Service is of Type Multicast IGMP Counters are also available, Figure 177.
Slot	Indicates the Slot. By pressing the it's possible to view service specific counters (Only to Unicast services with DHCP Relay Agent) Both differential values and Absolute values area available to display by pressing the Differential values or Absolute values in the DHCP Slot Statistics dialog box, Figure 176.
Detail	If the service is available in more than one slot, on the Column details a command expand is shown. By pressing expand the row will be expanded with all the ports available to that service, Figure 175. At the details column the collapse link is available allowing to hide service details.

Figure 175. Service details expand

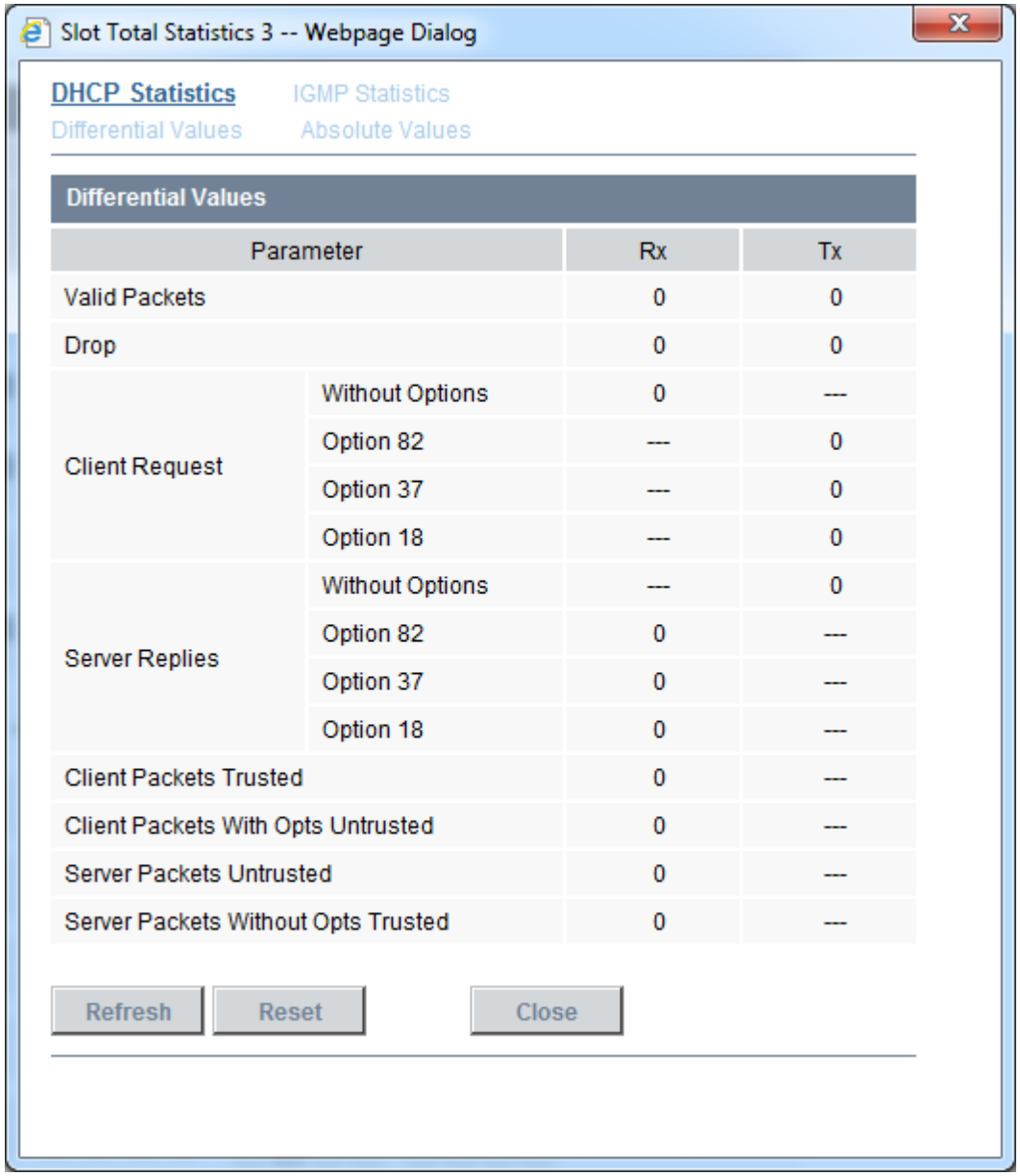


In the Services Counters table, there are the counters associated to each client taking into account the Service VLANs.

By pressing the counter for that specific port is activated, by pressing the it's possible to view service specific counters. Depending on the type of service, it's possible to view the following counters:

- Unicast Services with DHCP op.82, op.37 and op.18 Relay Agent: dhcp counters, Figure 176
- Multicast Services: IGMP v2 and v3 counters, Figure 177
- Total Packets: for all types of services, Figure 178

Figure 176. DHCP counters



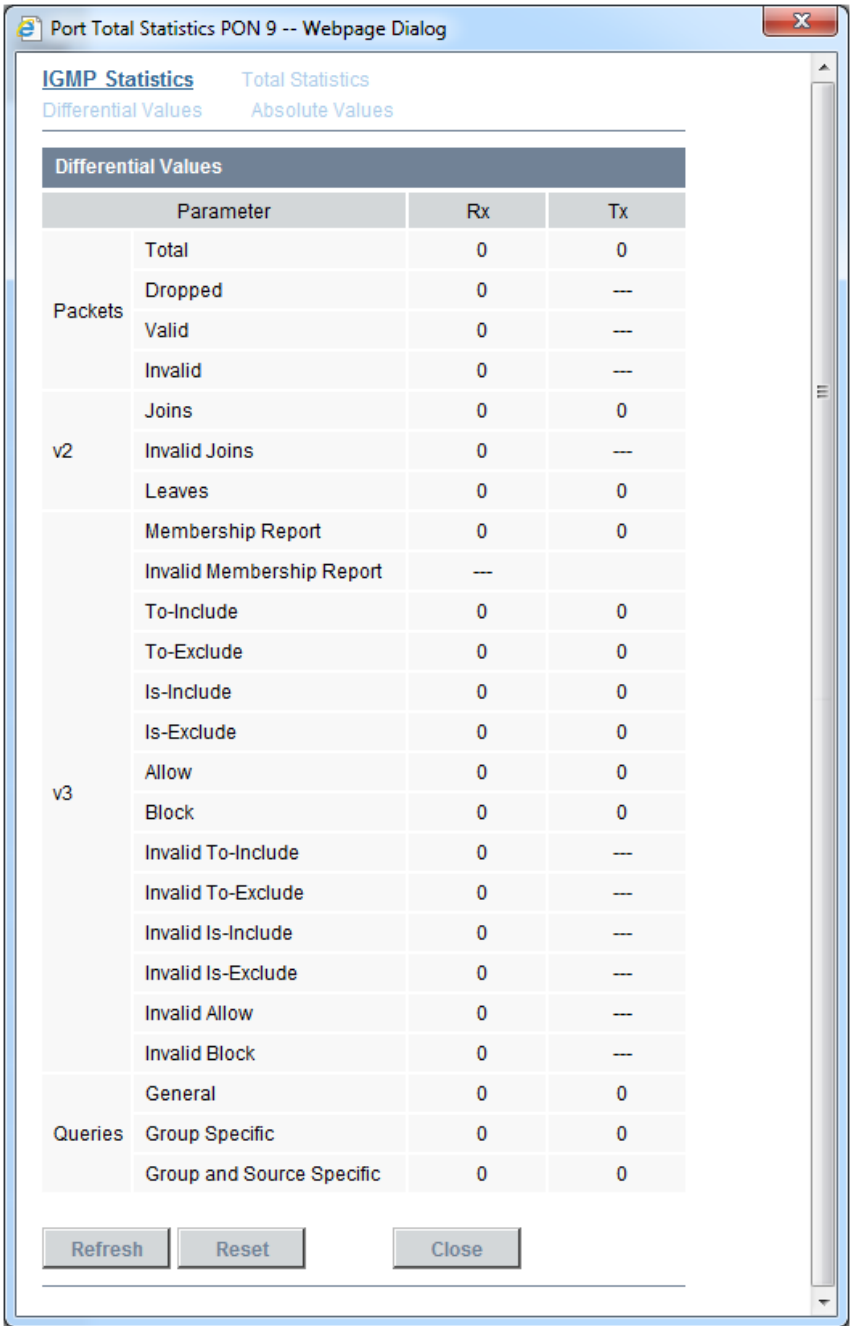
The DHCP statistics table is composed by the following parameters:

Table 120. DHCP statistics parameters

Parameter	Description
Valid Packets	Indicates the number of transmitted and received valid DHCP packets
Drop	Indicates the number of transmitted and received DHCP dropped packets

Client Request	Indicates the number of transmitted and received DHCP client request packets • **Without Options** • **Option 82** • **Option 37** • **Option 17**
Server Replies	Indicates the number of transmitted and received DHCP server replies packets • **Without Options:** • **Option 82** • **Option 37** • **Option 17**
Client Packets Trusted	Number of dropped packets because they are client requests without options received in Trusted interfaces (Network side)
Client Pack with Opts Untrusted	Number of dropped packets because they are client requests with options received in Untrusted interfaces (Client side)
Server Packets Untrusted	Number of dropped packets because they are server replies with options received in Untrusted interfaces (Client Side)
Server Pack without Options Trusted	Number of dropped packets because they are server replies without options received in Trusted interfaces (Network Side)

Figure 177. IGMP Counters

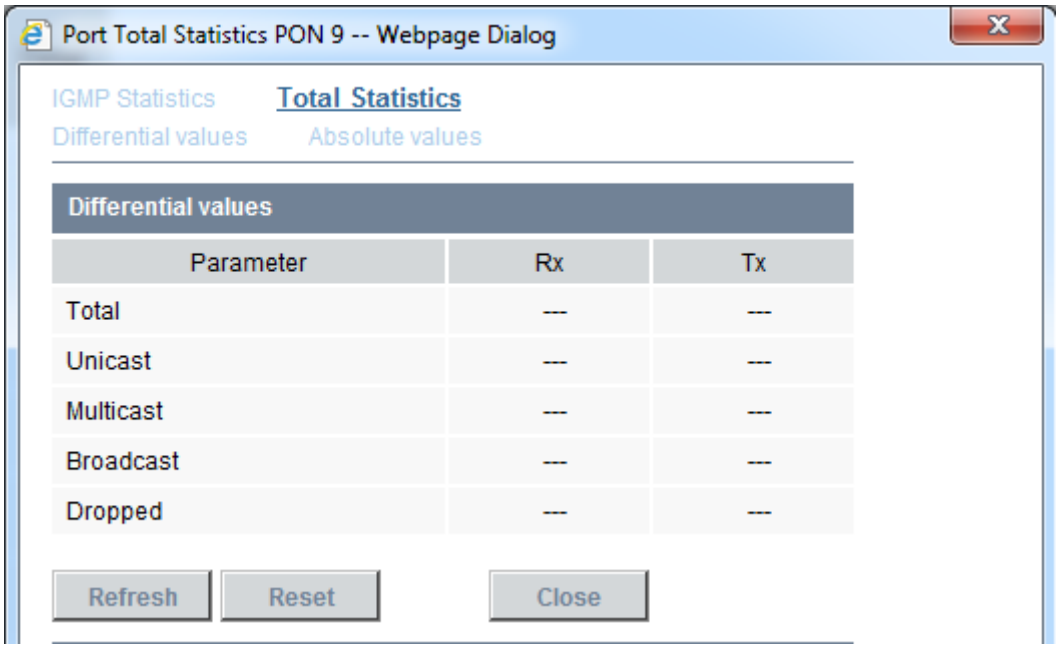


The IGMP statistics table is composed by the following parameters:

Table 121. IGMP statistics parameters

Parameter	Description
Packets	Indicates the number of transmitted and received packets (Total and Partial counters displayed): • **Total:** sum of all packets • **Dropped:** sum of all dropped packets • **Valid:** sum of all valid (compliant with the IGMP standards) packets • **Invalid:** sum of all invalid (non-compliant with the IGMP standards) packets
V2	Indicates the number of transmitted and received IGMPv2 packets of type • **Join** • **Invalid Join** • **Leave**
V3	Number of Transmitted and Received IGMPv3 packets (Total and Partial counters displayed) of type: • **Membership Report** • **Invalid Membership Report** • **To-Include** • **To-exclude** • **Is-Include** • **Is-Exclude** • **Allow** • **Block** • **Invalid To-Include** • **Invalid To-Exclude** • **Invalid Is-Include** • **Invalid Is-Exclude** • **Invalid Allow** • **Invalid Block**
Queries	Number of transmitted and Received Queries (Total and Partial counters displayed) • **General:** of type General queries • **Group Specific:** of type Group specific queries • **Group and Source Specific:** of type Group and Source specific queries

Figure 178. Packets port Counters



The Packets port statistics table is composed by the following parameters:

Table 122. Packets port statistics parameters

Parameter	Description
Total	Total number of packets
Unicast	Total number of Unicast packets
Multicast	Total number of Multicast packets
Broadcast	Total number of Broadcast packets
Dropped	Total number of Dropped packets

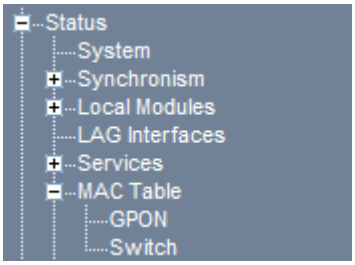
MAC TABLE

The MAC Table Status sub-menu has two items,

- GPON
- Switch

In the CLI section of this manual, the MAC Table status information is described in section “mac-table” node, subsection “status” sub-node.

Figure 179. MAC Table Status sub-menu

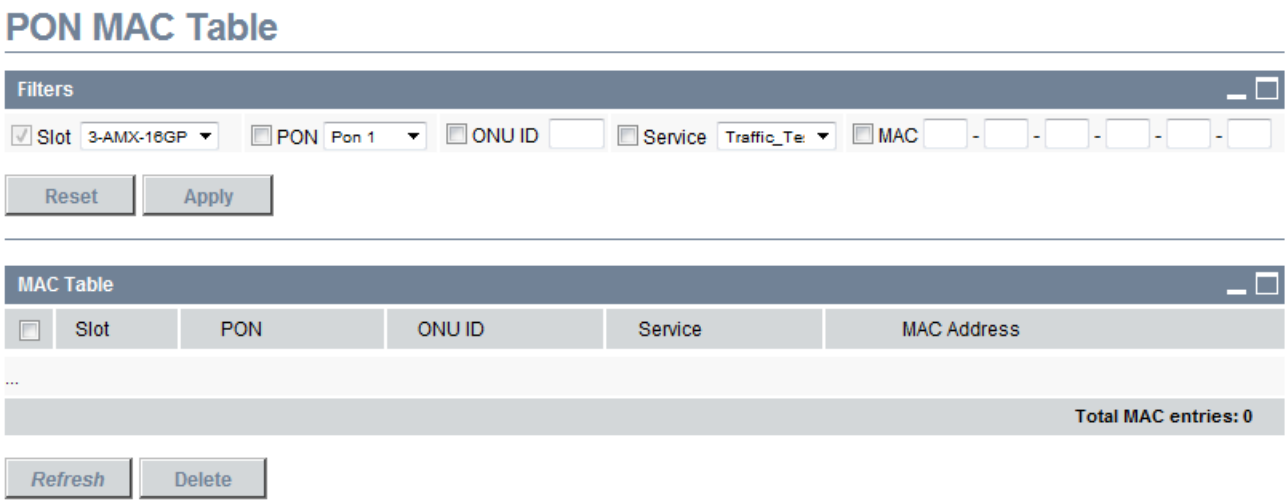


GPON

GPON menu item opens a PON MAC Table window, Figure 180, composed by two tables:

- Filters: selects criteria to visualize MAC addresses;
- MAC table: Learned client MAC addresses displayed according to filter options

Figure 180. GPON MAC table



For the Unicast Unstacked Services, MAC learning is performed, learning the MAC addresses of the several clients. The MAC address table can be very large, in which case in order to facilitate analysis of the table, MAC address filtering must be used, to select and display only the desired MAC addresses.

The filter definition criteria parameters are the following:

Table 123. Filters selection parameters

Parameter	Description
Slot	Selection of Tributary PON line card AMX-16G to filter from a list of pairs –Slot # - inserted PON Line card (example 17-T16G)
PON	Selection of PON interface to filter from a list of available PON interfaces
ONU ID	Selection of ONU# to filter from a list of available ONUs

Service	Selection of service to filter from a combo box with the available services
MAC	Selection of MAC address to filter by introducing the desired MAC address

The MAC address table is composed by the following parameters:

Table 124. MAC address TABLE parameters

Parameter	Description
Slot	Indicates the Slot
PON	Indicates the PON interface
ONU ID	Indicates the ONU
Service	Indicates the Service
MAC Address	Indicates the learned MAC address
Total MAC entries	Indicates the total number of MAC entries in the table

For each GPON interface it's possible to learn up to 4096 MAC addresses. The MAC addresses are removed from the MAC table in the following situations:

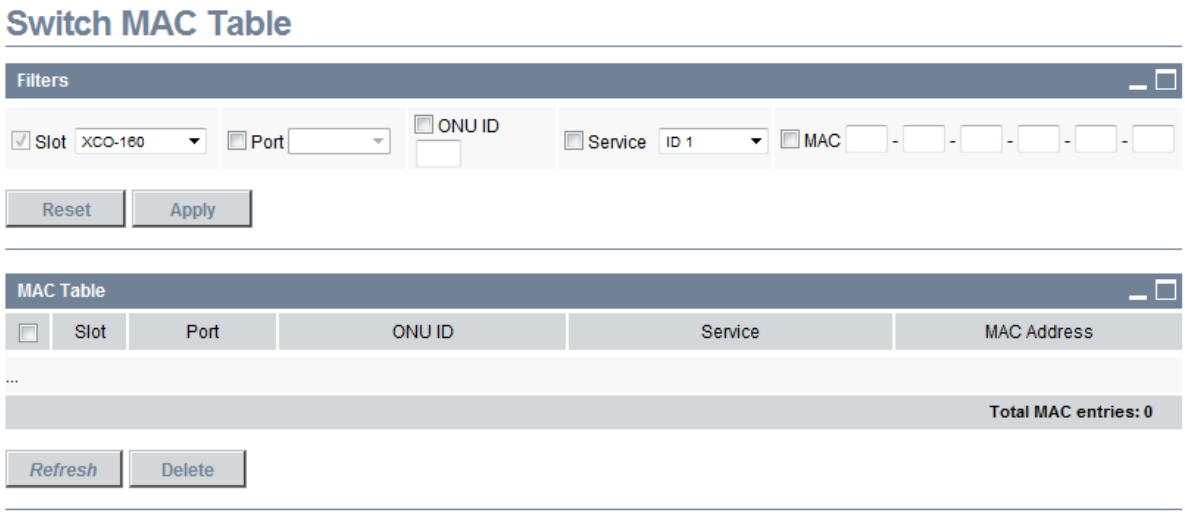
- Aging time has expired
- ONT Eth port to which the service is connected is turned off
- The service is removed from the ONU
- By selecting the MAC address and press Delete.

SWITCH

Switch menu item opens a Switch MAC Table window, Figure 181, composed by two tables:

- Filters: selects criteria to visualize MAC addresses;
- MAC table: Learned client MAC addresses displayed according to filter options

Figure 181. Switch MAC table window



For the Unicast Unstacked Services and for the Management VLAN, MAC learning is performed, learning the MAC addresses of the several clients. The MAC address table can be very large, in which case in order to facilitate analysis of the table, MAC address filtering must be used, to select and display only the desired MAC addresses.

The filter definition criteria parameters are the following:

Table 125. Filters selection parameters

Parameter	Description
Slot	Selection of Slot#- card to filter list of pairs –Slot # - inserted card (Switch Fabric card or PON line card); For Switch Fabric cards, only one Switch Fabric is active in the system, no Slot# is indicated but only the card identification (example XCO-160)
Port	Selection of port interface to filter from a list of available Port interfaces
ONU ID	Filtering by ONU ID: the desired ONU ID must be typed in
Service	Selection of Service Id to filter from a list of available Services
MAC Address	Selection of MAC address to filter by introducing the desired MAC address

The MAC address table is composed by the following parameters:

Table 126. MAC address table parameters

Parameter	Description
Slot	Indicates the Slot
Port	Indicates the Port
ONU ID	Indicates the ONU
Service	Indicates the Service. In case "--"the MAC learned isn't associated to any service.
MAC Address	Indicates the learned MAC address
Total MAC entries	Indicates the total number of MAC entries in the table

The MAC addresses are removed from the MAC table in the following situations:

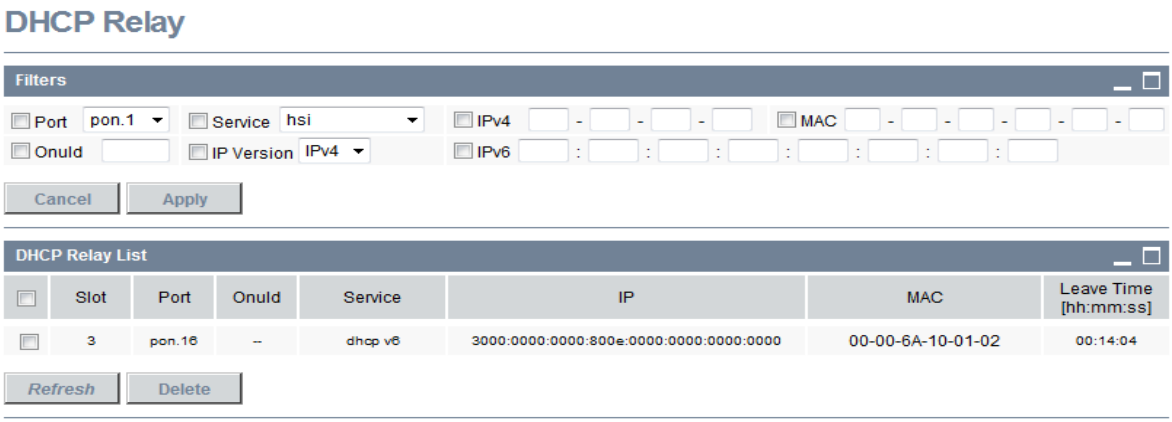
- Aging time has expired
- By selecting the MAC address and press Delete

DHCP

DHCP Status menu item opens a DHCP Relay window, Figure 182, composed by two tables:

- Filters: selects criteria to visualize DHCP Relay List,
- DHCP Relay List

Figure 182. DHCP Relay status Window



DHCP Relay List shows information related with the messages changed between the DHCP clients and servers, indicating the client/MAC/IP association and the respective lease time. DHCP snooping is only made in DHCP op.82 services.

Filtering can be used, to select and display only the desired entries on the list..

The filter definition criteria parameters are the following:

Table 127. DHCP Relay filter selection parameters

Parameter	Description
PON	Selection of PON interface to filter from a list of available PON interfaces
Service	Selection of Service Id to filter from a list of available Services
OnuId	Selection OnuId to filter by introducing the desired OnuId
IP Version	Selection of IP version (IPv4 or IPv6)
IPv4/IPv6	Selection of IPv4/IPv6 address to filter by introducing the desired IPv4/IPv6 address
MAC Address	Selection of MAC address to filter by introducing the desired MAC address

The DHCP Relay List is composed by the following parameters:

Table 128. DHCP Relay List parameters

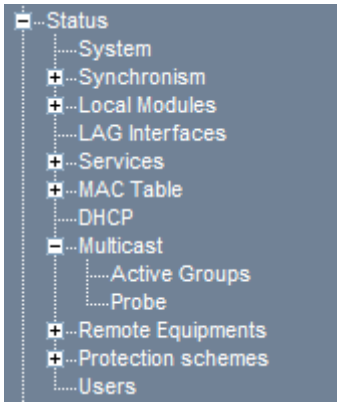
Parameter	Description
Slot	Indicates the Slot for the learned entry
Port	Indicates the Port for the learned entry
OnuID	Indicates the ONU for the learned entry
Service	Indicates the service for which the entry was learned
IP	Indicates the client IP Address
MAC	Indicates the client MAC Address
Leave Time [hh:mm:ss]	Indicates the time it take for the entry to be removed. In case this value is 00:00:00 indicates that there was an IP request from the client (DHCP Request) and there wasn't any response from the server (DHCP ACK).

MULTICAST

The Multicast Status sub-menu has two items, Figure 183:

- Active Groups
- Probe

Figure 183. Multicast Status sub-menu



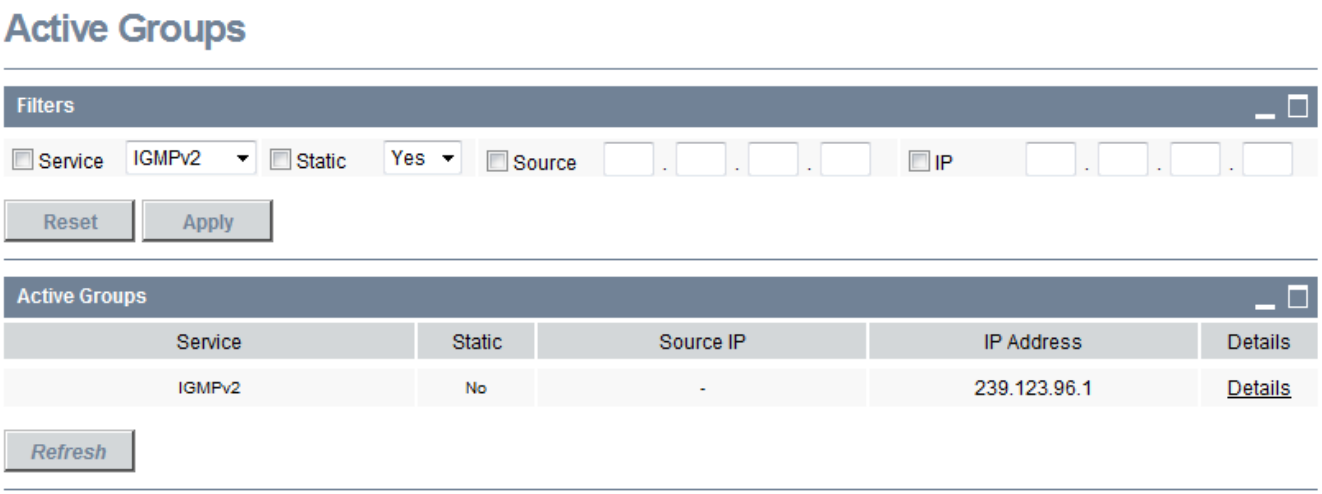
ACTIVE GROUPS

The Status submenu Multicast Active Groups item selection opens an Active Groups window composed of two tables:

- Filters
- Active Groups

In the Active Groups window, Figure 184, is possible to visualize the Multicast IP Groups present at OLT, as well as the customers that are watching them. The List of active groups can be very large, in which case filters can be used to display a list Active Groups according to the selection criteria defined in the filter.

Figure 184. Active Groups window



In order to visualize status information for an active group, the multicast service associated to the group must be selected on the Service combo box, Figure 19. Refresh button will apply the current filter definitions to display the channels that satisfy the specified selection criteria.

Figure 185. Active Groups Filter Service Combo box

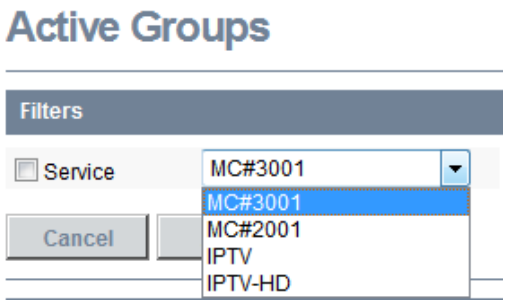


Table 129. Active Groups selection filter configuration parameters

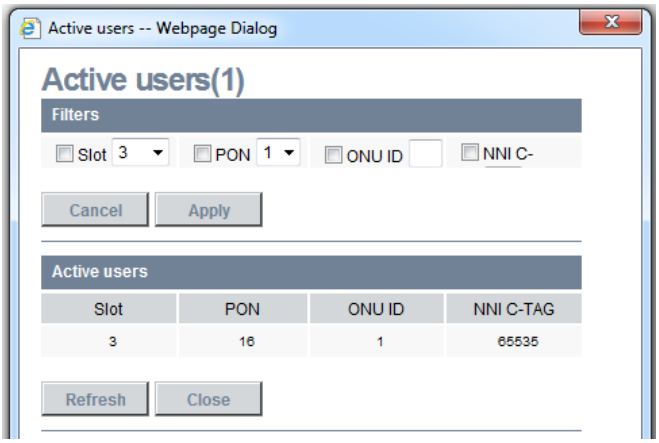
Parameter	Description
Service	Selection of Multicast Service Id to filter from a list of available Multicast Services
Static	Yes for a static Group selection
Source	Selection of the Multicast IP address to filter by introducing the desired Multicast IP address
IP	Selection of the Multicast IP address to filter by introducing the desired Multicast IP address

The Active Groups table is composed by the following parameters:

Table 130. Active Groups parameters table

Parameter	Description
Service	Indicates the name of the Multicast Service
Static	Yes for a static Group selection
IP Address	Indicates the Multicast Group IP address
Details	By pressing Details a dialog box with the active users watching the Multicast Group will open; A selection filter is available to define the active users display selection criteria. The user is identified by the board, PON, Onu Id and NNI C-TAG. (Figure 186)

Figure 186. Active users dialog box



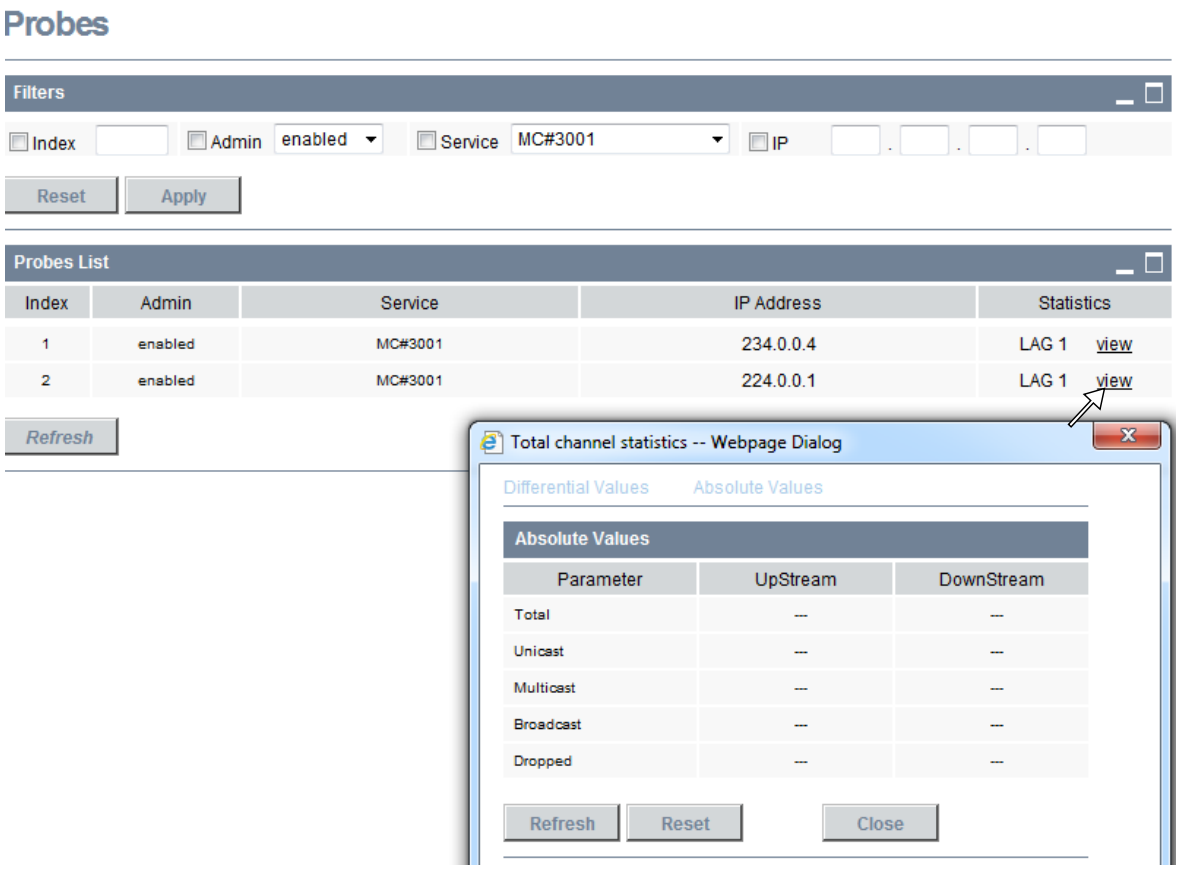
PROBES

The selection of Status submenu Multicast, Probe Item will open a Probes window, Figure 187. To check if the Multicast traffic is actually being received in the OLT, Multicast Probes can be activated to view the Multicast Packets received for a specific group. It's possible to apply Index, Admin, Service and IP filters to be easier to sort the desired probe(s).

Table 131. Filters selection parameters

Parameter	Description
Index	Selection of Probe Index to filter by introducing the desired Probe Index
Admin	Selection of Probe Administrative State to filter (Up or Down)
Service	Selection of Multicast Service Id to filter from a list of available Multicast Services
IP Address	Selection of Multicast IP address to filter by introducing the desired Multicast IP address

Figure 187. Status::Multicast::Probes window



The Probes List table is composed by the following parameters:

Table 132. Filters selection parameters

Parameter	Description
Index	Indicates the Probe Index
Admin	Indicates the Probe Administrative State (Up or Down)
Service	Indicates the name of the Multicast Service
IP Address	Indicates the Multicast Group IP address
Statistics	By pressing view a window with the Multicast Group Statistics will open, Figure 187.

REMOTE EQUIPMENT

The Status submenu Remote Equipments has one item ONUs

The Status submenu Remote Equipments, ONUs item selection opens an ONU Status window composed of seven tables:

- ONU Selection, Figure 188;

- Ethernet Interfaces, Figure 189;
- Analog RF Interfaces, Figure 191;
- GPON Interfaces, Figure 192;
- E1 Interfaces, Figure 193;
- GEM Port Counters, Figure 194;
- Service Counters, Figure 195;
- Software Images and Maintenance, Figure 198,
- T-CONT, Figure 200.

The ONU Selection table, Figure 188, allows the setting of criteria to filter the ONUs for which status information will be displayed in the remaining tables.

Figure 188. ONUs Status window: selection table

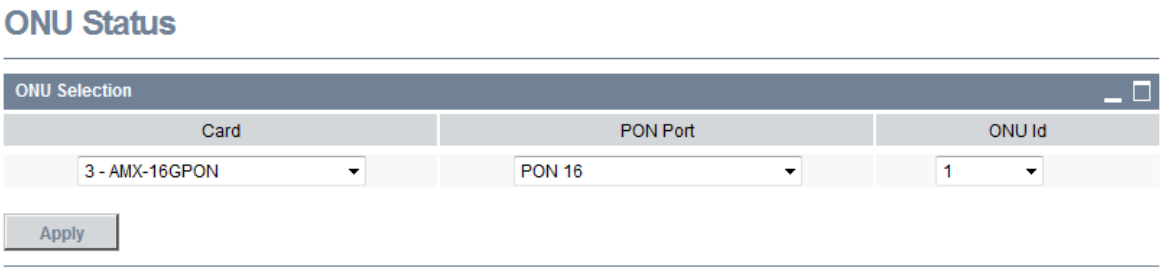
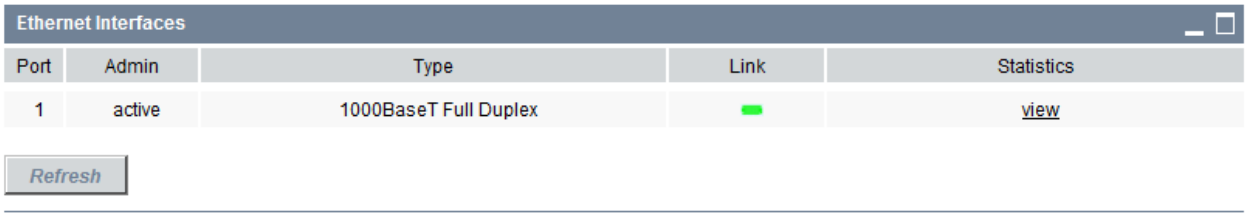


Table 133. ONU Selection parameters

Parameter	Description
Card	Indicates the Card
PON port	Indicates the PON port
ONU Id	Indicates the ONU Id

Figure 189. ONU Status window: Ethernet Interfaces Table

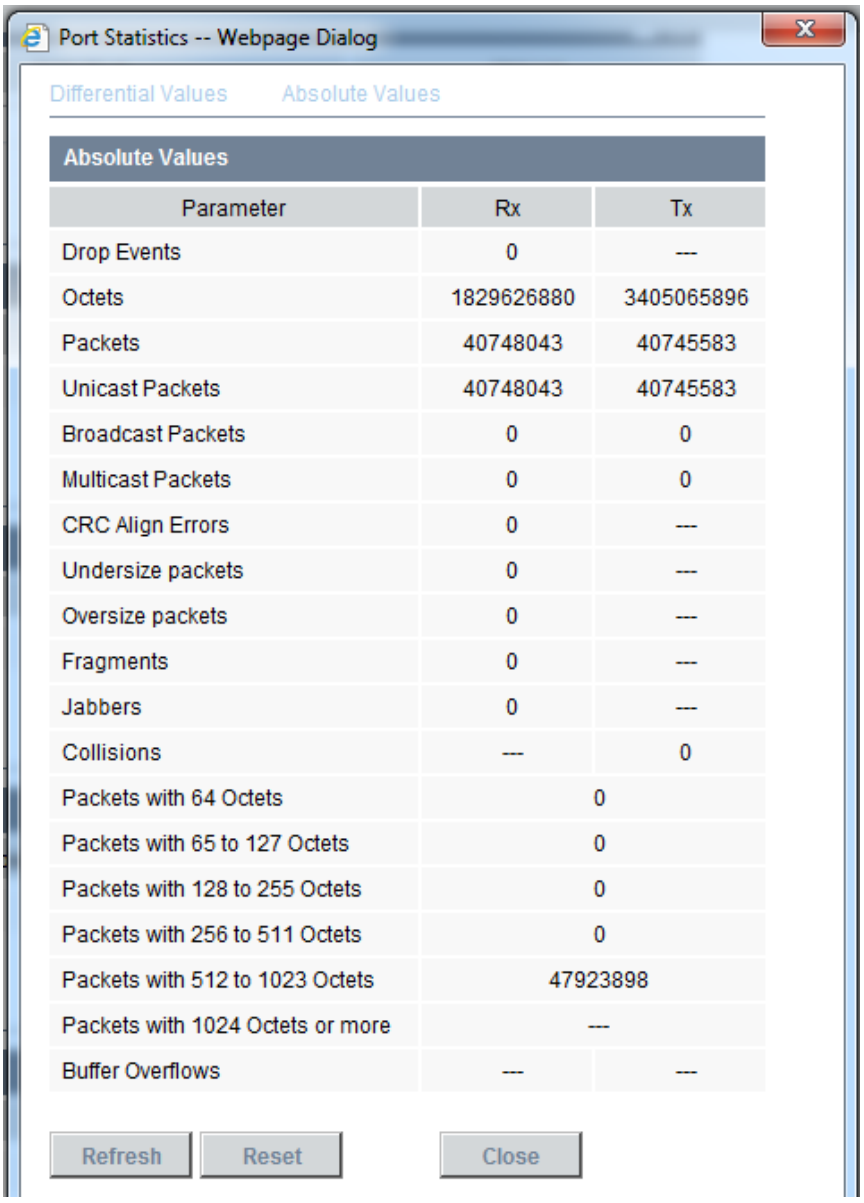


The Ethernet Interfaces status table is composed by the following parameters:

Table 134. Ethernet Interfaces Status parameters

Parameter	Description
Port	Indicates the Ethernet Port
Admin	Indicates the Administrative State
Type	Indicates the link speed and duplex
Link	Indicates the physical port state
Statistics	By pressing view a dialog box with the Ethernet counters will open, Figure 190.

Figure 190. Ethernet Port Statistics

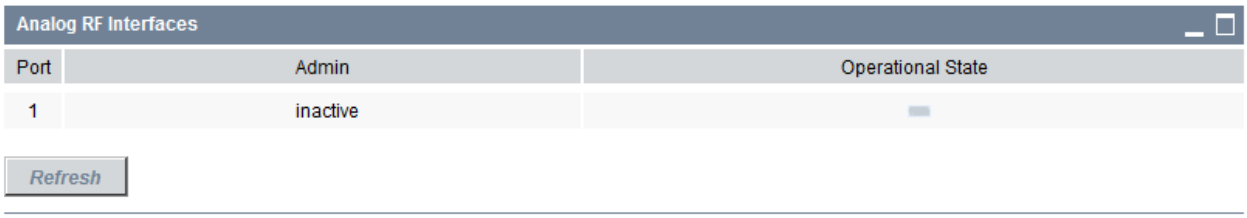


The Ethernet Statistics table is composed by the following parameters, Table 135.

Table 135. Ethernet Statistics parameters table

Parameter	Description
Drop Events	Number of dropped packets
Octets	Number of bytes
Packets	Number of Packets
Unicast Packets	Number of Unicast Packets
Broadcast Packets	Number of Broadcast Packets
Multicast Packets	Number of Multicast Packets
CRC Align Errors	Number of packets with wrong FCS (Frame Check Sequence)
Undersize Packets	Number of packets with size less than 64 bytes
Oversize Packets	Number of packets with size over than 1518 bytes
Fragments	Number of packets with size less than 64 bytes and with wrong FCS (Frame Check Sequence)
Jabbers	Number of packets with size over than 1518 bytes and with wrong FCS (Frame Check Sequence)
Collisions	Number of collisions in the Ethernet Segment (only in Half Duplex)
Packets with 64 Octets	Number of 64 bytes packets
Packets with 65 to 127 Octets	Number of packets with size between 65 to 127 bytes
Packets with 128 to 255 Octets	Number of packets with size between 128 to 255 bytes
Packets with 256 to 511 Octets	Number of packets with size between 256 to 511 bytes
Packets with 512 to 1023 Octets	Number of packets with size between 512 to 1023 bytes
Packets with 1024 to 1518 Octets	Number of packets with size between 1024 to 1518 bytes
Buffer Overflows	Number of Buffers overflows.

Figure 191. Analog RF Interfaces table

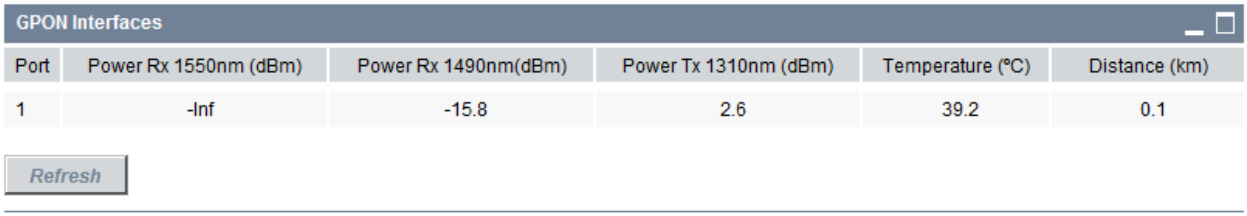


The Analog RF Interfaces Status table is composed by the following parameters:

Table 136. Analog RF Interfaces parameters

Parameter	Description
Port	Indicates the Analog RF Port
Admin	Indicates the Administrative State
Operational State	Indicates the Port Operational State

Figure 192. GPON Interface table

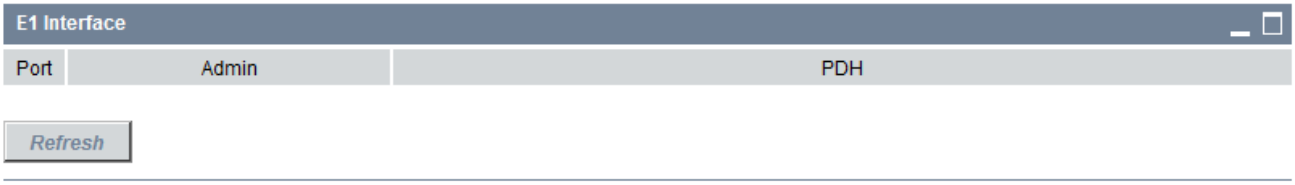


The GPON Interfaces table is composed by the following parameters:

Table 137. GPON interfaces parameters

Parameter	Description
Port	Indicates the GPON Port
Power Rx 1550nm (dBm)	Indicates the 1550 nm Received Optical Power in dBm
Power Rx 1490nm (dBm)	Indicates the 1490 nm Received Optical Power in dBm
Power Tx 1310nm (dBm)	Indicates the 1310 nm Transmitted Optical Power in dBm
Temperature (ºC)	Indicates the ONT Temperature in ºC
Distance (km)	Indicates the ONT distance in km

Figure 193. E1 Interface table

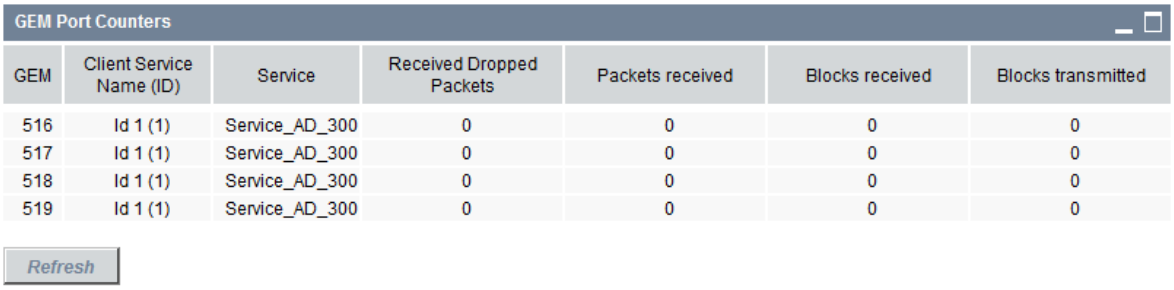


The E1 Interfaces table is composed by the following parameters:

Table 138. E1 interfaces parameters

Parameter	Description
Port	Indicates the E1 Port
Admin	Indicates E1 interface amniistrative state
PDH	

Figure 194. GEM Port counters table



The GEM Port Counters table is composed by the following parameters:

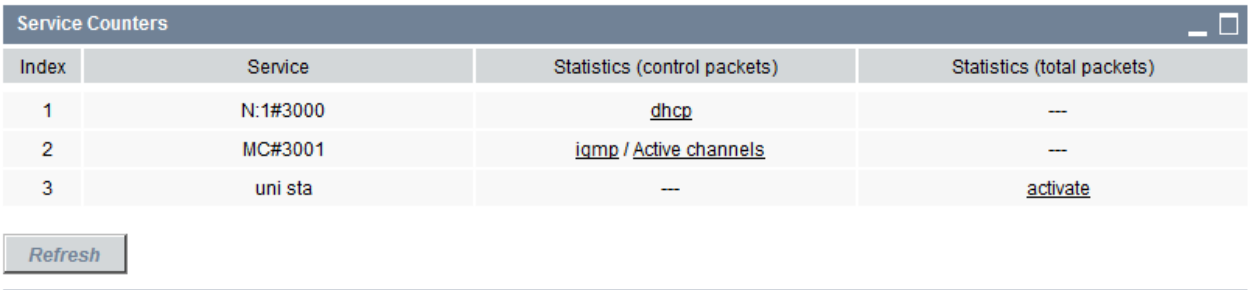
Table 139. GEM Port Counters parameters

Parameter	Description
GEM	GEM ID
Client Service Name (ID)	Identification of Client Service
Service	Indicates the service identification
Received Dropped Packets	Indicates the number of received dropped packets
Packets received	Indicates the number of received packets
Blocks received	Indicates the number of received GEM blocks
Blocks transmitted	Indicates the number of transmitted GEM blocks

In the Service Counters table, there are the counters associated to each client taking into account the Service and Client Vlans. By pressing the links on the columns “Statistics (control packets)” and “Statistics (Total packets)” it’s possible to view service specific counters:

- Unicast Services with DHCP op.82 Relay Agent: DHCP counters
- Multicast Services: IGMP counters and Active Channels
- Total Packets: for the Unicast, UniVoIP or Bitstream stacked services is possible to activate Total Packets counters

Figure 195. Services counters

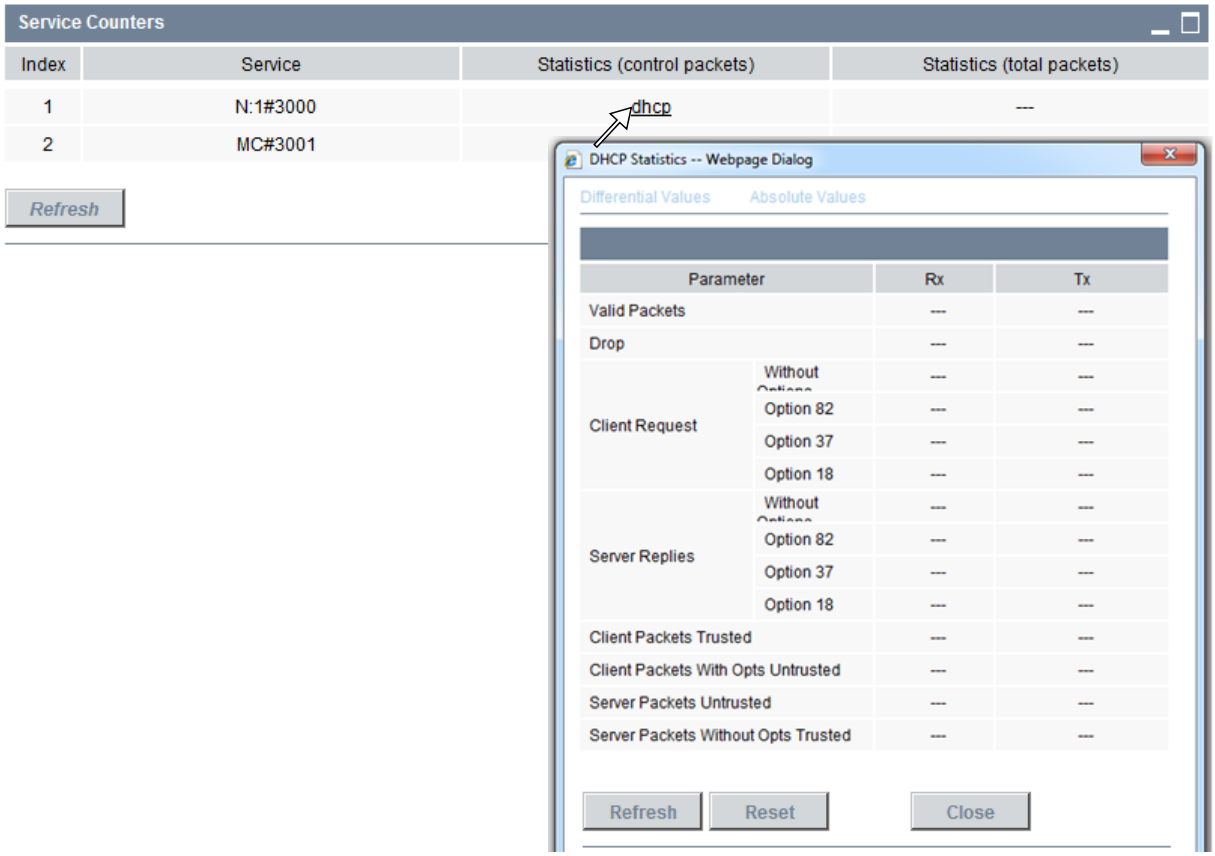


The Service Counters table is composed by the following parameters:

Table 140.Service Counters parameters table

Parameter	Description
Index	Indicates the Service Index
Service	Indicates the Service Name
Statistics (Control Packets)	By pressing the links it's possible to view Control Plane Packets associated with the service, Figure 196
Statistics (Total Packets)	By pressing the links it's possible to activate/deactivate/view Data Plane Packets associated with the service, Figure 195

Figure 196. DHCP Statistics per client/service



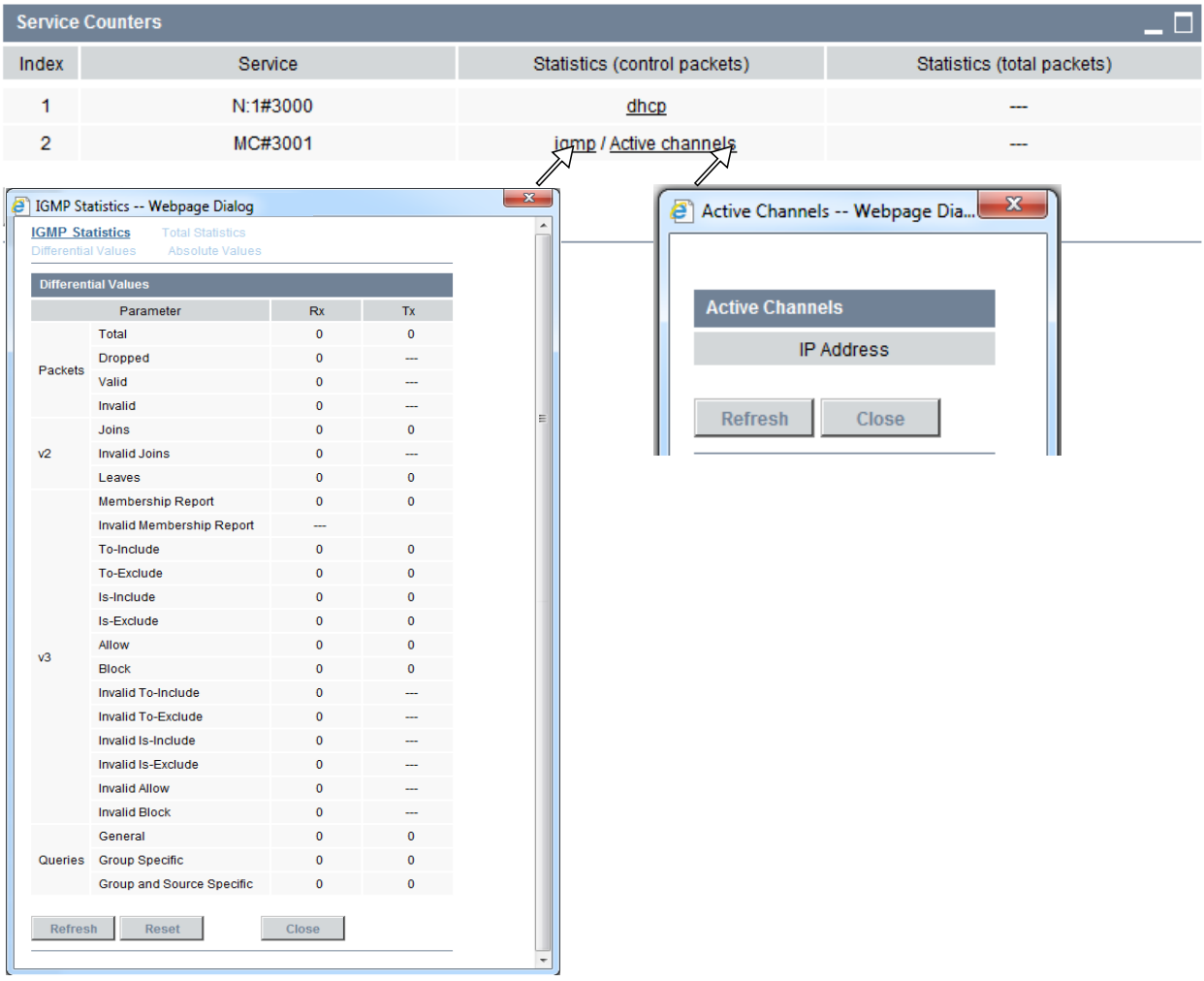
The DHCP statistics table is composed by the following parameters:

Table 141. DHCP statistics parameters table

Parameter	Description

Valid Packets	Indicates the number of transmitted and received DHCP packets
Drop	Indicates the number of transmitted and received DHCP dropped packets
Client Request	Indicates the number of transmitted and received DHCP client request packets: • **Without options** • **Option 82** • **Option 37** • **Option 18**
Server Replies	Indicates the number of transmitted and received DHCP server replies packets: • **Without options** • **Option 82** • **Option 37** • **Option 18**
Client Packets Trusted	Number of dropped packets because they are client requests without options received in Trusted interfaces (Network side)
Client Packets with Opts Untrusted	Number of dropped packets because they are client requests with Options received in Untrusted interfaces (Client side)
Server Packets Untrusted	Number of dropped packets because they are server replies with options received in Untrusted interfaces (Client Side)
Server Packets without Opts Trusted	Number of dropped packets because they are server replies without options received in Trusted interfaces (Network Side)

Figure 197. IGMP counters per client/service



The IGMP statistics table is composed by the following parameters:

Table 142. IGMP statistics parameters

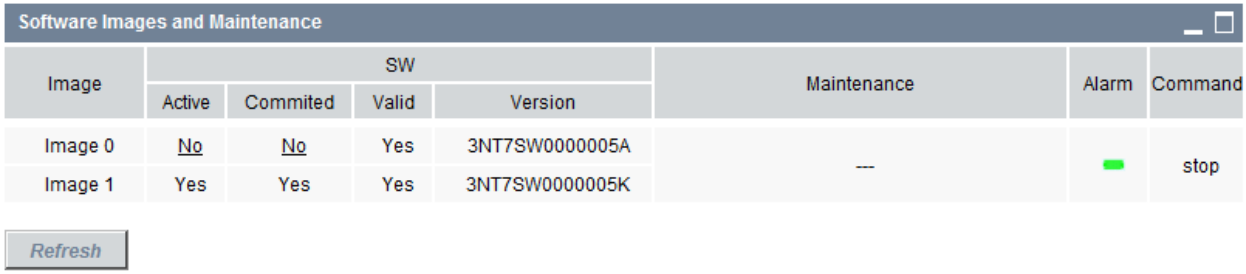
Parameter	Description
Packets	Indicates the number of transmitted and received packets (Total and Partial counters displayed): • **Total:** sum of all packets • **Dropped:** sum of all dropped packets • **Valid:** sum of all valid (compliant with the IGMP standards) packets • **Invalid:** sum of all invalid (non-compliant with the IGMP standards) packets
V2	Indicates the number of transmitted and received IGMPv2 packets of type

	• **Join** • **Invalid Join** • **Leave**
V3	Number of Transmitted and Received IGMPv3 packets (Total and Partial counters displayed) of type: • **Membership Report** • **Invalid Membership Report** • **To-Include** • **To-exclude** • **Is-Include** • **Is-Exclude** • **Allow** • **Block** • **Invalid To-Include** • **Invalid To-Exclude** • **Invalid Is-Include** • **Invalid Is-Exclude** • **Invalid Allow** • **Invalid Block**
Queries	Number of transmitted and Received Queries (Total and Partial counters displayed) • **General:** of type General queries • **Group Specific:** of type Group specific queries • **Group and Source Specific:** of type Group and Source specific queries

In the Multicast Services it's possible to view the Multicast Groups the client is watching, Figure 197.

In Software Images and Maintenance table it's possible to check the ONU/T's firmware version, as well as the Maintenance state and a command to stop the SW/FW upgrade.

Figure 198. Software and Maintenance table

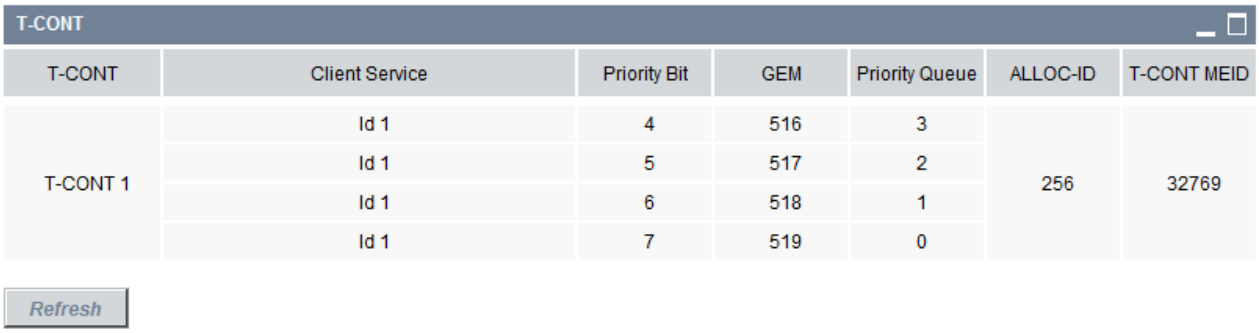


The Software Images and Maintenance table is composed by the following parameters:

Figure 199. Software Images and Maintenance parameters

Parameter	Description
Image	Indicates the Image name
SW	**Active**: Indicates which of the images is active, after the message "Upload finished correctly", pressing No the active version will change, the ONT will reboot and startup with the new version. **Committed:** Indicates which of the images is active after a reboot, after the message "Upload finished correctly", pressing No the committed version will change **Valid:** Indicates if the SW/FW version is Valid **Version:** Indicates the SW/FW version name
Maintenance	Indicates the Firmware Download state
Alarm	Indicates the state of the last upgrade
Command	Command to stop upgrading the ONT's FW

Figure 200. T-CONT table



The T-CONT table is composed by the following parameters:

Figure 201. Software Images and Maintenance parameters

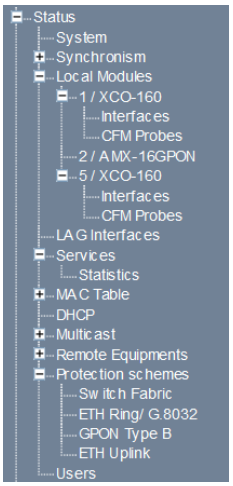
Parameter	Description
T-CONT	Identifies the T-CONT
Client Service	Indicates Client Service
Priority Bit	Indicates used priority bits
GEM	Indicates used GEM
Priority Queue	Indicates Used priority queue
ALLOC-ID	Indicates ALLOC-ID
T-CONT MEID	Indicates T-CONT MEID

PROTECTION SCHEMES

The Protection Schemes Status sub-menu has two items, Figure 202:

- Switch Fabric protection
- ETH Ring/G.8032
- GPON Type B
- ETH Uplink

Figure 202. Protection Schemes sub-menu

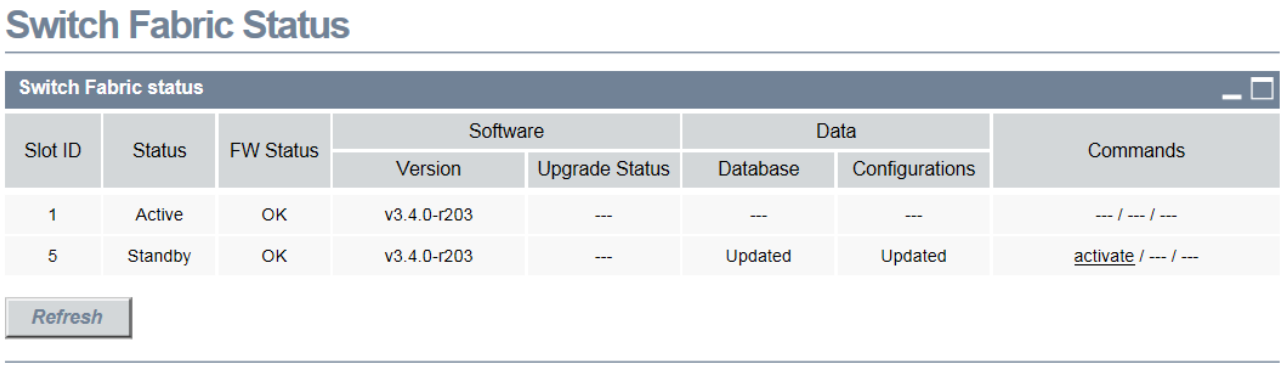


SWITCH FABRIC

The Protection Schemes sub menu item Switch Fabric item selection opens a window, Figure 203, composed of a Switch Fabric Status table with information on theswitch fabric boards on the system. It is possible in this window to:

- Check which of the Switch Fabrics is active (In the case of redundancy)
- Send commands to force the Swtich Fabric switching.

Figure 203. Switch Fabric Status window



The Switch Fabric Status table is composed by the following parameters:

Table 143. Switch Fabric Status parameters

Parameter	Description
Slot Id	Indicates the Switch Fabric Slot
Status	Indicates the Switch Fabric Status (Active or Inactive-updated data)
Commands	Commands to make the manual or forced switching Switch Fabric commutation. If it's manual, if the system detects any fail during the commutation process, the switching Switch Fabric won't commutate. If it's forced, the switching Switch Fabric will commutate whether or not there is any problem.

ETH RING/G.8032

The Protection Schemes sub menu item ETH Ring/G.8032 item selection opens a window, Figure 203, composed of an Ethernet Ring Protection status table with information on the working and protection instances part of the Ethernet protection ring scheme. It is possible in this window to:

- Check which of instances and interfaces are in the protection state
- View details on the APS channel status
- View the configured values for the timers
- Send commands to force/ maintain or clear Ring protection switching.

In CLI section of his manual, ERP staus information is described in section "erp-ring" node, subsection,"status" sub-node

Figure 204. Ethernet Ring Protection status window

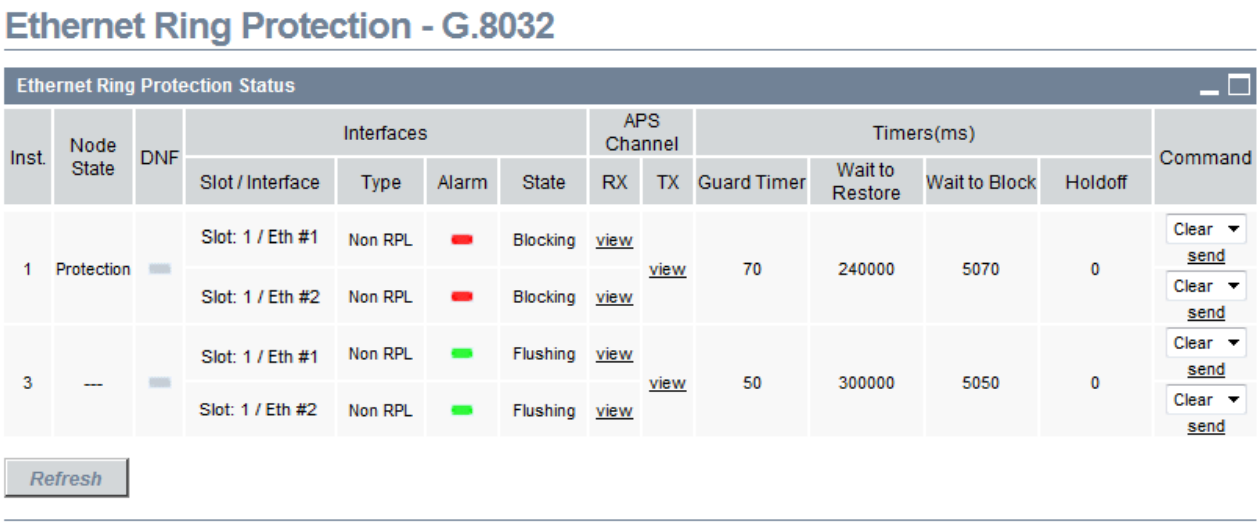


Table 144. ERP Instance Configurarion details Dialog Box parameters

Parameter Group	Parameter	Description
	Inst	ERP instance Id (number)
	DNF	Filtering Database Non Flush status bit
	Node State	Identifies node state Protection/--
Interfaces	**Slot/Interface**	Identifies interface in the system by Slot/ interface pair
	Type	Identifies interface protection classification (RPL/Non RPL/RPL Neighbor)
	Alarm	This alarm signals activity in the interface
	State	Interface state (Blocking/Flushing)
APS Channel	**RX/TX**	Automatic Protection Switch Channel receiver and transmitter state per interface. Selecting view opens a dialog box with more detailed information, on APS channel, RX per port, Figure 205 and APS Channel, TX, Figure 206
Timers (ms)	**Guard Time**	Shows configured guard timer value
	Wait to Restore	Shows configured Wait to Restore timer value
	Wait to Block	Shows configured Wait to Block timer value
	Holdoff Time	Shows configured Holdoff timer value
	Commands	Send link selection sends the command chosen from a combo box. Available commands are: • **Clear:** clear switching • **FS:** Force switching • **MS:** Maintain switching

Figure 205. APS Channel RX per port detailed status information

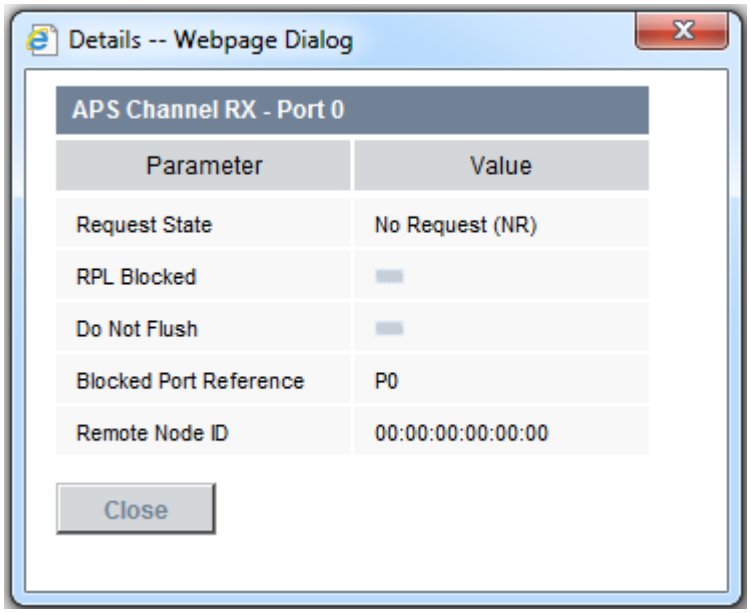


Table 145. APS Channel,RX per port, detailed status parameters

Parameter	Description
Request State	Received APS channel request state message
RPL Blocked	Visual indicator on RPL Blocked State
Do not Flush	Visual indicator on Do not Flush message
Blocked Port Reference	Blocked port reference ID
Remote Node ID	Identification of Remote Node by ID

Figure 206. APS Channel TX detailed status information

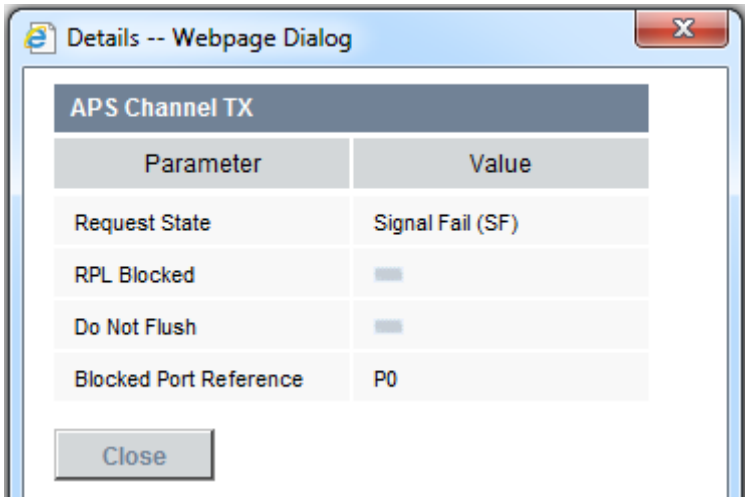


Table 146. APS Channel,TX per port, detailed status parameters

Parameter	Description
Request State	Transmitted APS channel request state message
RPL Blocked	Visual indicator on RPL Blocked State
Do not Flush	Visual indicator on Do not Flush message
Blocked Port Reference	Blocked port reference ID

GPON TYPE B PROTECTION

The selection of Protection Schemes Sub-menu item GPON Type B opens a GPON Type B Protection window, Figure 207.

Figure 207. GPON Type B Protection Status window

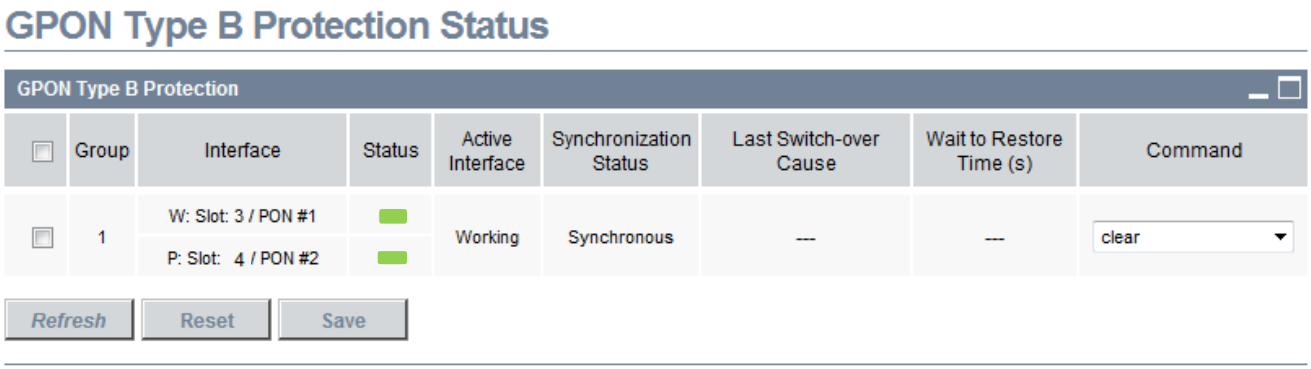


Table 147. GPON Type B Protection window parameters

Parameter	Description
Group	GPON type B protection group
Interface	Interfaces part of the protection group
Status	Interface Operational status
Active Interface	Indicates the active interface
Synchronization Status	Indicates the Synchronization satus
Last Switch-over Cause	Indicates the cause of the last GPON protection type B switch over
Wait to Restore Time (s)	Indicates the wait to restore time in case of switch over.
Command	Indicates commands that can be executed on the protection group: • **clear** • **lockout** • **force to protection** • **force to working** • **manual to protection** • **manual to working**

ETHERNET PROTECTION

The selection of Protection Schemes Sub-menu item ETH Port opens a Ethernet Protection Status window, Figure 210.

Figure 208. Ethernet Protection Status window

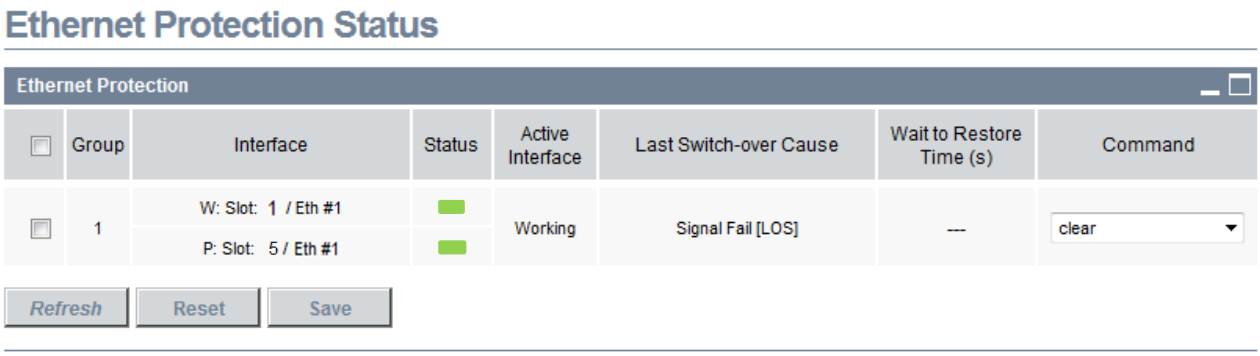


Table 148. Ethernet Protection window parameters

Parameter	Description
Group	Ethernet port protection group
Interface	Interfaces part of the protection group
Status	Interface Operational status
Active Interface	Indicates the active interface
Synchronization Status	Indicates the Synchronization satus
Last Switch-over Cause	Indicates the cause of the last Erhernet port protection switch over
Wait to Restore Time (s)	Indicates the wait to restore time in case of switch over.
Command	Indicates commands that can be executed on the protection group: • **clear** • **lockout** • **force to protection** • **force to working** • **manual to protection** • **manual to working**

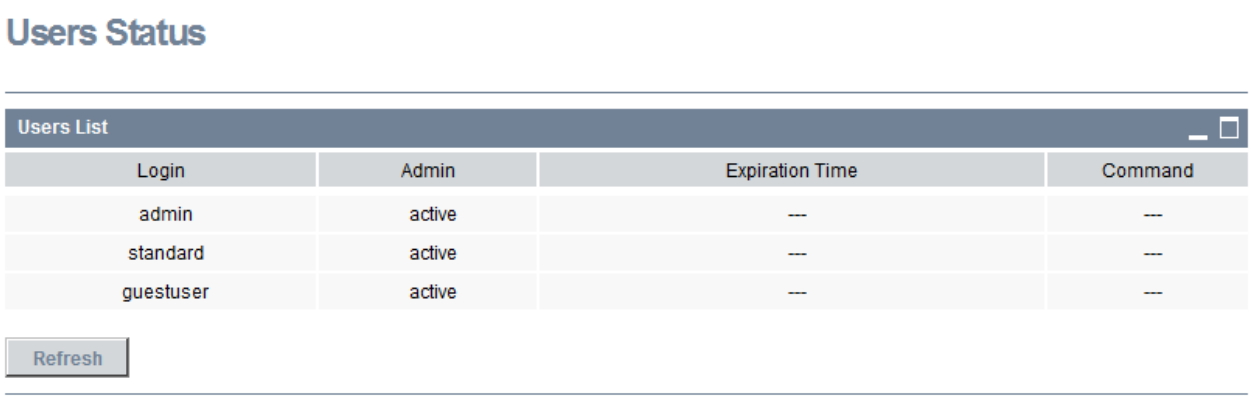
USERS

This item of the status menu is only visible for users with administration profile.

The selection of status menu users item opens a Users Status window showing a users list with OLT access permissions and its status, Figure 209 .

In CLI, users' status information is available in the subsection "status" command.

Figure 209. Users Status window



The Users List table is composed by the following parameters:

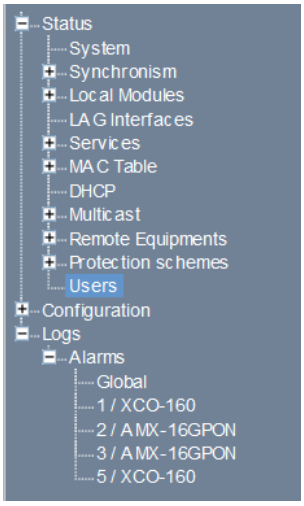
Table 149. Users List parameters

Parameter	Description
Login	User Login name
Admin	User access permission status
Expiration Time	Time after which the user access permission is no longer valid
Commands	Commands.

LOGS

The Logs menu consists on a sub-menu “Alarms” composed by a Global Item and an item for each of the line cards inserted in the OLT, Figure 210.

Figure 210. Logs menu, Alarms sub-menu



In the CLI section of this manual, the Logs related features are described in section

"logs" node.

ALARMS

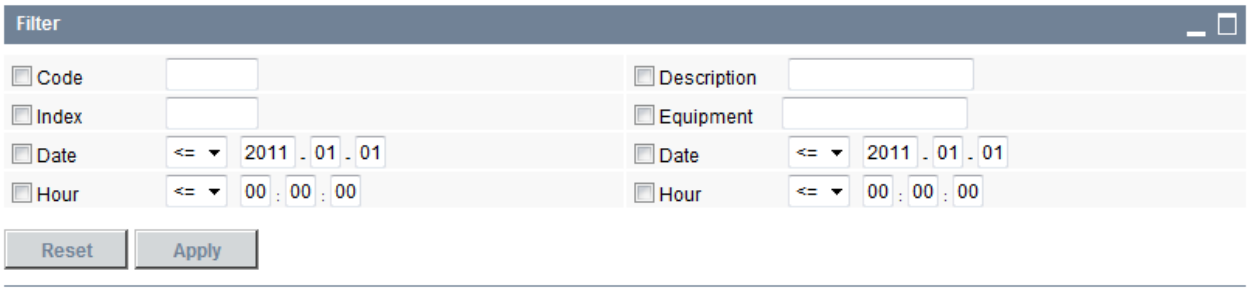
In the Alarms Logs sub-menu it's possible to view the alarms and events' history for each board and also for the Global system. In order to turn easier to analyze problems that have occurred, filters may be applied.

GLOBAL::LINE CARD

Global/Line Card item selection opens a System Log/Module line card part number window consisting of two tables:

- Filter, Figure 211;
- Event List, Figure 212.

Figure 211.System log window, filter table



There are filters to analyze the date of the anomaly, port, etc. If the port isn't administratively up, the alarms related to it won't be registered.

The following filtering parameters can be applied:

Table 150. Filters parameters

Parameter	Description
Code	Alarm Code
Index	Port or interface where the alarm or event occurred
Date and Hour	It's possible to select a beginning, ending or interval to visualize the alarms and events
Description	Alarm or event description
Equipment	Alarm or event source

Figure 212.Event List example (global)

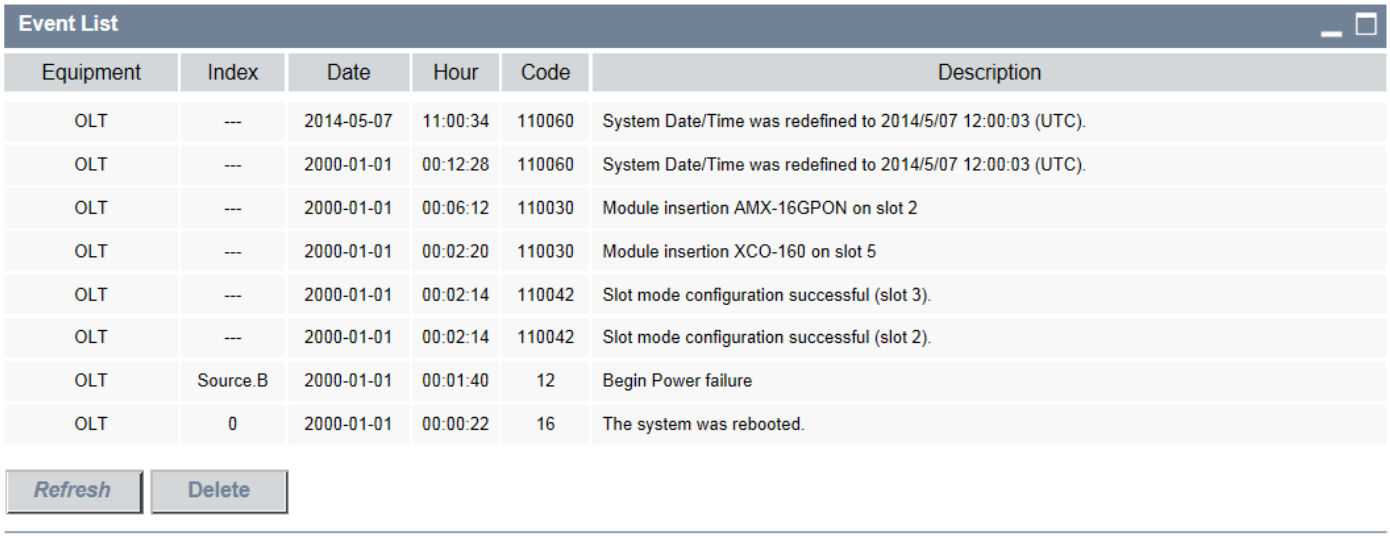


Table 151. Event List parameters

Parameter	Description
Equipment	Alarm or event source
Index	Port or interface where the alarm or event occurred
Date and Hour	Date and hour when the alarm or event occurred
Code	Alarm Code
Description	Alarm or event description

In the end of the table there are two buttons:

- **Refresh:** updates the table
- **Delete:** Deletes all the alarms

Chapter 7
CLI

SYSTEM MANAGEMENT

The OLT equipment can be managed locally either using a web browser; via Web Ti application, described in Chapter 5 subsection SYSTEM MANAGEMENT of this Users' Guide, or using a Linux based Command Line Interface, CLI, described in this Chapter. Both WebTi and CLI provide the system with Local Craft Terminal (LCT) functionalities.

There are two different ways to manage the equipment, (for more details on how to connect the OLT system for management please refer to section SYSTEM MANAGEMENT, in this User's Guide):

- Connect to the management port ETH, (G1 or G2), either locally by connecting directly to the PC Ethernet port, or remotely, via service provider DCN;
- Inband Management using a configured management VLAN which interconnects MPLS network to DCN.

ACCESS TO THE EQUIPMENT

Any OLT equipment comes with an integrated Command Line Interface (CLI) for system management and configuration.

In order use the CLI OLT interface, the OLT equipment must accessed via Telnet or SSH protocols, using the console port (RS232).

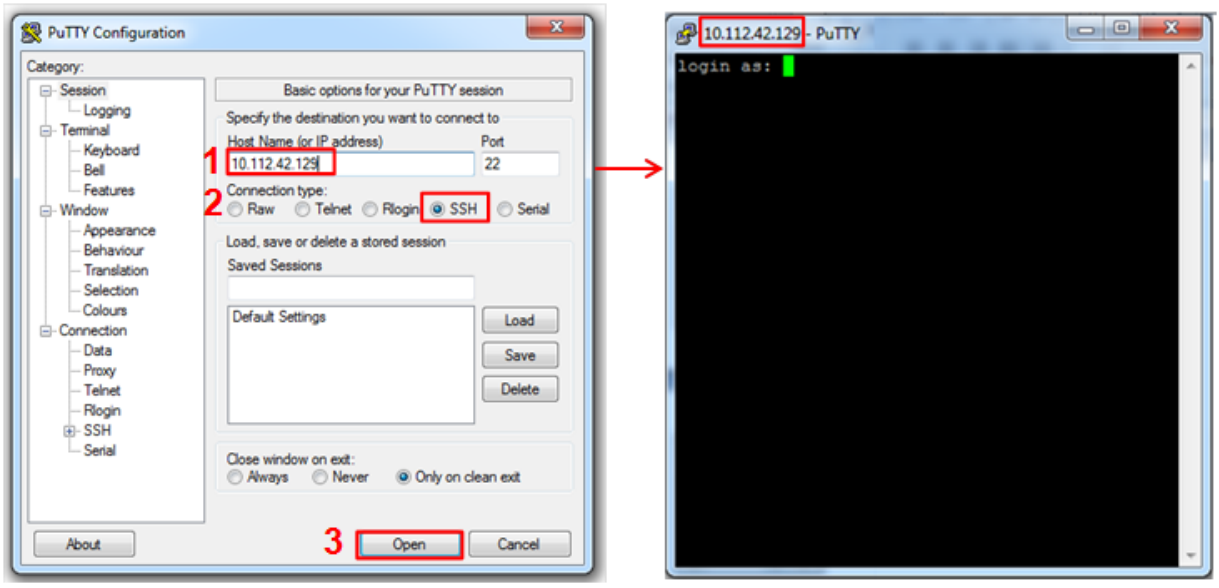
An SSH/telnet client application, as for example PuTTY, which is an open source software SSH and telnet client, developed originally for the Windows platform, can be used for accessing the OLT system.

At the client application configuration window, Figure 213, open a session at the OLT equipment you want to access:

- Typing the OLT IP address to access, 1;
- Selecting connection type (Telnet or SSH), 2;
- Pressing Open, 3

A session will be opened and a login prompt at the OLT equipment presented to the user, Figure 213.

Figure 213. Accessing to the OLT equipment via SSH



SYSTEM ACCESS CONTROL

To Access the CLI application the user must be logged in the system.

The system provides three default users, with different privileges for the operations that can be performed in the system.

- Admin

  Full access: configuration of the equipment and of the accesses to the system: users' list and permissions.

- Standard

  OLT configuration permission; cannot view or manage the system users' list

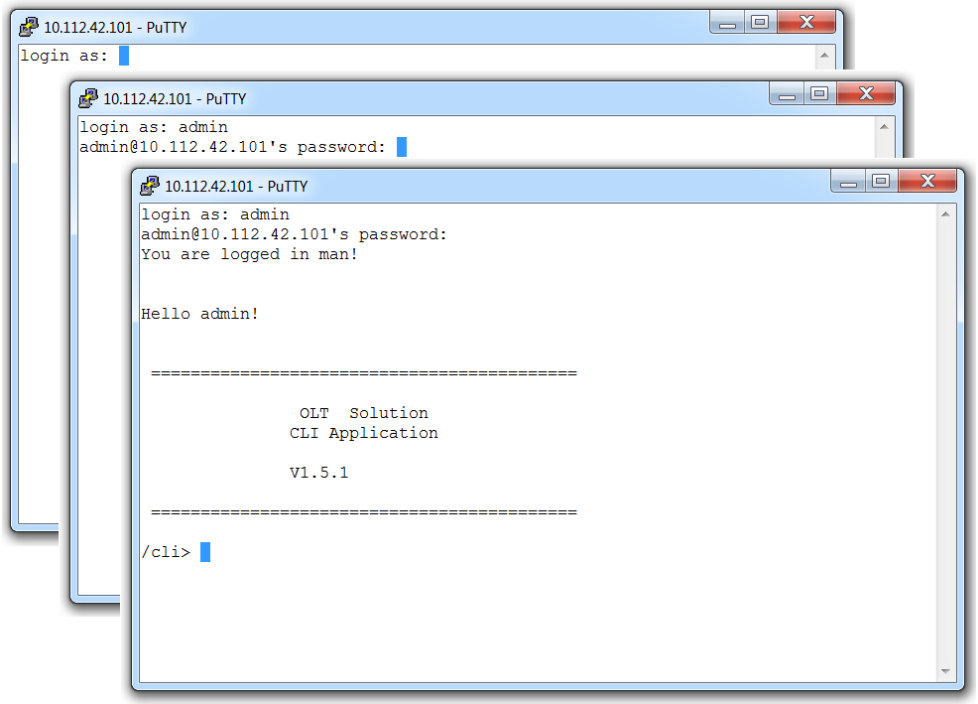
- Guestuser

  Permission to view

The default password is the same as the user login. Only the user with admin privileges can change users' passwords.

Typing the login and password at the session opened in the OLT System the user is presented with the CLI application initial window, Figure 214.

Figure 214. OLT access and CLI Initial window



CLI OVERVIEW

FEATURES:

- Hierarchical tree structure:
    - The CLI has a structured interface.
    - Navigation through the hierarchy structure (tree) is ensured through the “cd” and “cd ..” commands.
- Consistency:
    - commands providing the same functionality have the same name,
    - consistency of the semantics used is also ensured
- Auto Complete:
    - CLI automatically completes the commands or options using the tab key.

COMMANDS

All CLI commands must belong to a node. The main node is called the root node. A node can have

A command can be executed either directly in the node it belongs to using the command name, or from another node in which case the command full path must be used.

History of last used commands is available by pressing the arrows keys (up, down).

The **cd** command operates as in UNIX: **'cd /'** returns to the root node, '**cd ..**' navigates up, and so on.

GENERAL USAGE COMMANDS

Set of commands to improve CLI usability by providing generic navigation and help information:

- **Help,** Figure 215**:**

  Provides basic and generic command usage description

- **?** typed following a command, Figure 216:

  Provides a brief description of the command, the command syntax and of all the usable arguments.

- **dir,** Figure 217**:**

  Lists the commands and sub-nodes dependent on the current location node;

  listed sub-nodes are followed by /, (example interfaces/).

- **Tree,** Figure 218**:**

Graphical display of the entire tree of sub-nodes and commands considering the current position as a starting point;

- **clear:**

  Cleans the screen.

- **quit:**

  Exit the CLI interface.

Figure 215. Use of help

```
/cli> help

      CLI - Command Line Interface
            Basic Usage

Type 'dir' to show a list of available commands.
Navigate trough nodes using 'cd', 'cd ..', 'cd /'...
Execute a command by typing its name.
Press 'TAB' for auto-complete features.
Press 'Ctr+u' to clear all inserted characters in the current line.

You can run commands by writing the full path.
Type '?' after a command to see specific help:
      import-export/show ?

Some commands can be run recursively, automatic calling themselves in each
child node:
      showconfig +recursive

Type 'help' to see this text again.
```

Figure 216. Use of ?

```
/cli/equipment/system> config ?

Usage:
```

```
CONFIG          Global system configuration.

 [OPTIONAL]
 --access-node        Access Node ID
 --alarm-rep-mode  Define the alarm reporting mode. (none|snmp|xml)
 --auto-update  Automatically upgrade the second Switch Fabric. (enable|disable)
 --contact  Set contact information as appropriate
 --date       Set the system date as YYYY/MM/DD (UTC)
 --description   Set a description, in this context.
 --locationSet the system location as appropriate
 --name     Insert a name STRING.
 --numerical-rack    system rack (numerical value)
 --numerical-shelf  system shelf (numerical value)
 --numerical-sub-rack    system subrack (numerical value)
 --rack       system rack
 --shelf      system shelf
 --sub-rack       system subrack
 --time       Set the system time as hh:mm:ss (UTC)
```

Figure 217. dir command

```
/cli/ip> dir
  restart
  write
  interfaces/
  networking/
  route/
```

Figure 218. IP tree, sub-nodes and commands

```
/cli/ip> tree
+ ip[@restart, @write]
  + interfaces[]
    + inband[@config, @show, @showconfig]
    + ip[@config, @show, @showconfig]
```

```
+ networking[@config, @show, @showconfig]
+ route[@create, @remove, @show, @showconfig]
```

COMMOM USAGE COMMANDS

Set of commands usable in different node and sub-node, conserving the name and syntax for consistency, but whose arguments vary depending on the context, in number, type (optional/mandatory) and range of values.

Table 152. Common Usage Commands

Name	Purpose
show	Displays relevant information in a table format.
config	Modifies the configuration of various parameters
showconfig	Generates a list of commands that replicates the current configuration of the node where the command is executed. When executed with the option +recursive generates the same list to all descendent nodes.
create	Creates a new entity on the node where the command was executed
remove	Removes an entity on the node where the command was executed

COMMAND STRUCTURE

A command has a name and may have arguments (parameters) of type mandatory or optional.

For the execution of the command, command name must be used and if existing, mandatory arguments, with the correct command syntax.

Table 153. CLI command structure

Use		Description
Command		Command name
	Parameter(s)	Parameters can be mandatory or optional
	--param=value	Syntax for the argument and the respective value
	<value>	Value for each argument
	<value1 | value2 >	Possible values are separated with |
	<value1 : value2 >	Range of possible values: all values from value1 to value2
	<[value1] | value2 >	Default values are given with brackets ([ ])

Table 154. CLI command examples

Examples	Description
/services/show	Will run the command **show** in the node **services**. The command does not need any arguments
/equipment/boards/config --slot=3 --admin=true	Will run the command **config** in the node boards. The command takes two arguments, slot with value 3 and admin with value true. This command will activate the board on slot 3

CLI NAVIGATION

After login in an OLT system, CLI initial window is presented with the prompt /CLI, Figure 219. After login the user is at the root node, Figure 219.

Figure 219. CLI initial window and prompt

```
You are logged in man!


Hello standard!


 ==========================================


          OLT  Solution
          CLI Application

          V1.2.0
          2013/08/09

          16:40:36

 ==========================================

/cli>
```

The **help** command will display generic navigation help information, Figure 215.

dir command list the node available commands and sub nodes, Figure 220.

Figure 220. dir command output at root node

```
/cli> dir
  cd
  clear
```

```
dir
help
mem
quit
show
showconfig
tree
applications/
backup-manager/
cfm-probe/
dhcp/
equipment/
erp-ring/
interfaces/
ip/
logs/
mac-table/
multicast/
profiles/
remote-eq/
services/
synchronism/
users/
```

Pressing Tab key will display another view of node available commands and sub nodes, Figure 221.

Figure 221. Tab key displays commands and sub-nodes in that node

```
/cli>
../ dhcp/     logs/      services/
./  dir   mac-table/     show
applications/     equipment/     mem     showconfig
backup-manager/     erp-ring/ multicast/     synchronism/
cd help profiles  tree
cfm-probe/         interfaces/    quit  users/
clear    ip/   remote-eq/
```

```
/cli>
```

Typing **cd** followed by **tab** will start to auto-complete with node names,Figure 221

Pressing the **Enter** key will execute the command navigates to the specified node.

The CLI prompt displays the current location node, Figure 223

Figure 222. Auto-complete with tab key

```
/cli> cd app
```

```
/cli>cd applications
```

Figure 223. CLI prompt displays current location node

```
/cli>cd applications
/cli/applications>
```

tree command executed at a given node displays the full list of sub-nodes and available commands per node/sub-node, Figure 224.

Figure 224. tree command output: current node, applications, sub-nodes list

```
/cli/applications> tree
+ applications[]
  + firmware-upgrade[]
    + files[@check, @config, @export, @import, @remove, @show, @status]
    + onu-upgrade[@apply-file, @availableValues, @execute]
  + manager[@config, @show, @showconfig]
  + olt-upgrade[@apply-file, @import]
  + time[]
    + ntp[@config, @create, @disable, @enable, @remove, @show, @showconfig]
    + time-zone[@availableValues, @config, @show, @showconfig]
```

In the picture above we have an example of the command tree. This command will display all the child nodes and commands for the node where it is executed on. If it's executed on the CLI root, it shows the complete CLI tree.

In the example above, Figure 180, all the applications sub-nodes and respective commands are shown.

- Child nodes are preceded with a '+' and indented;
- Each node has a list of commands within [ ] 's;

- Nodes that do not have commands have an empty list;
- Commands are preceded with a "@" character.

HELP ON COMMANDS AND ARGUMENTS USAGE: ?

Typing **?** in front of a command name (note that there is no help for nodes. only for commands) will display usage information for that command:

- brief description of the command purpose
- Usable arguments and type: optional/mandatory.
- Syntax for arguments

Possible values for the arguments may also be displayed in some cases, for non-dynamic arguments: for example, the slot argument does not have possible values shown because it depends on the context and on which slots are available in the equipment at the current time.

Figure 225. show ?: information on the usage of the show command in the interfaces/gpon node context

```
/cli/interfaces/gpon> show  ?

Usage:
  SHOW          Shows PON information for a specific HW slot.

  [OPTIONAL]
  --slot                    Identifies a slot. (not used for LAG)
```

To know the available options for the argument slot, in this case, the "**show**" can be executed without arguments.

According to the provided, when this command is executed in this node context, information is then displayed showing which slots have information available, in a table format in this case, Figure 226. Slots with YES in the Details column has information available.

Figure 226. Output of show command without arguments

```
/cli/interfaces/gpon> show
+-----------------------------------+
|General Information                |
+----+---------------+---------------+
|Slot|Card Name      |Details        |
+----+---------------+---------------+
|1   |XCO-160        |               |
|2   |AMX-48GE       |               |
|3   |AMX-48GE       |               |
|4   |AMX-48GE       |               |
|6   |FAN            |               |
+----+---------------+---------------+
/cli/interfaces/gpon>
```

Executing the command again but with argument – slot=3 will show the information for GPON interfaces on slot 2, line card AMX-16GPON, Figure 227.

Figure 227. Output of show command in gpon sub-node for slot 2

```
/cli/interfaces/gpon> show --slot=2
+-----------------------------------------------------------------------------------------------------------------------------------------------------------+
|Slot 2 AMX-16GPON - GPON Configuration                                                                                                                     |
+---+----------+----------+-------------+-------------+-------------+----------+--------------+-----------------+-------------------------------------+
|ID |Name      |Admin     |Mac Aging (s)|Max Dist. (Km)|Min Dist. (Km)|BER       |Downstream FEC|ONU Auto Discovery|PCP Priority Profile                |
+---+----------+----------+-------------+-------------+-------------+----------+--------------+-----------------+-------------------------------------+
|0  |PON 1     |disable   |240          |20           |0            |20        |disable       |enable           |--                                   |
|1  |PON 2     |disable   |240          |20           |0            |20        |disable       |enable           |(0)                                  |
|2  |PON 3     |disable   |240          |20           |0            |20        |disable       |enable           |(0)                                  |
|3  |PON 4     |disable   |240          |20           |0            |20        |disable       |enable           |(0)                                  |
|4  |PON 5     |disable   |240          |20           |0            |20        |disable       |enable           |(0)                                  |
|5  |PON 6     |disable   |240          |20           |0            |20        |disable       |enable           |(0)                                  |
|6  |PON 7     |disable   |240          |20           |0            |20        |disable       |enable           |(0)                                  |
|7  |PON 8     |disable   |240          |20           |0            |20        |disable       |enable           |(0)                                  |
|8  |PON 9     |disable   |240          |20           |0            |20        |disable       |enable           |(0)                                  |
|9  |PON 10    |disable   |240          |20           |0            |20        |disable       |enable           |(0)                                  |
|10 |PON 11    |disable   |240          |20           |0            |20        |disable       |enable           |(0)                                  |
|11 |PON 12    |disable   |240          |20           |0            |20        |disable       |enable           |(0)                                  |
|12 |PON 13    |disable   |240          |20           |0            |20        |disable       |enable           |(0)                                  |
|13 |PON 14    |disable   |240          |20           |0            |20        |disable       |enable           |(0)                                  |
|14 |PON 15    |disable   |240          |20           |0            |20        |disable       |enable           |(0)                                  |
|15 |PON 16    |enable    |240          |20           |0            |20        |disable       |enable           |(0)                                  |
+---+----------+----------+-------------+-------------+-------------+----------+--------------+-----------------+-------------------------------------+
```

In some situations there is a specific command only to show the possible values for each argument. For example on the node **"services"**, the command "**availableValues"** displays to which slot-ports services can be added.

COMMON NODE NAMES

Common node names, as for example Status and Statistics, correspond to nodes that appear as sub-nodes in diverse contexts (nodes) and aggregate a class of commands,

There are three main classes to aggregate commands:

- configuration
- statistics information
- status information

"Config" command that within a certain node configures some aspect of the equipment is present in the node tree single, i.e., without being aggregated under any special tree node name within the tree. This is valid for the **"show"** command in most of the cases as well.

All commands that are used to see statistics are aggregated in a sub-node "**statistics"** within the node tree.

All commands that report the status of the equipment (temperature, alarms, etc) are aggregated in a sub-node **"status**".

For example in the **"gpon"** node tree, Figure 228, there is a **"config"** command within node gpon, and a **"config"** command within sub node **"cos"**. Gpon sub-node **"statistics"** groups **"errors", "ethernet" and "gpon"** statistics, as for SFPs **"rx-power"** status information, they are grouped in gpon sub-node **"status"**.

Figure 228. interfaces/gpon tree

```
/cli/interfaces/gpon> tree
+ gpon[@config, @show, @showconfig]
  + cos[@config, @show, @showconfig]
```

```
+ statistics[]
  + errors[@show]
  + ethernet[@show]
  + gpon[@show]
+ status[@show]
  + SFPs[@show]
  + rx-power[@read-all, @show]
```

Therefore according to the above picture to manage **gpon** interfaces we have the following commands:

- gpon/config
- gpon/show
- gpon/showconfig

To see **gpon** status we have:

- gpon/status/show
- gpon/status/SFPs/show
- gpon/status/SFPs/rx-power/read-all
- gpon/status/SFPs/rx-power/show

To see **gpon** packet statistics and link status we have:

- gpon/statistics/gpon/show
- gpon/statistics/ethernet/show
- gpon/statistics/errors/show
- note that in this case, the node statistics itself does not allow any command

We can see the logic behind this structure. It's almost like building sentences**: gpon/status/SFPs/show** is telling you that it will show the status of SFPs entities in GPON interfaces.

Furthermore, we know that we should run **gpon/status/SFPs/rx-power/read-all** to "read all information" and only after execute **gpon/status/SFPs/rx-power/show**. We may not know what "read-all" stands for but we know the probable way of executing these commands (also seeing the command help, may help). The point here is that the organization of the commands and nodes and their names is intended to have a meaning that the user can take advantage of.

ABOUT THE "showconfig" COMMAND

The showconfig command exists on every node that makes configurations (nodes that have create, remove, config commands).

Since the showconfig command always performs the same action, it will be referred only once to avoid replicating the same information for every node. The showconfig command help text can be seen in Figure 229.

Figure 229. CLI on line help on " showconfig" usage in this node context

```
/cli> services/showconfig ?

Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

Table 155. "showconfig" Command syntax and description

Syntax	**/path to node/showconfig**
Description	Print the commands needed to reach the current configuration.
Screen output	Full command(s) path and used arguments and values to reach the current configuration, eg, Figure 230; showconfig command used in the context of time-zone subnode for a particular system shows the command line that should be used to configure in the system the current configuration.

The **showconfig** command has no arguments.

Figure 230. showconfig command screen output example

```
/cli/applications/time/time-zone/showconfig>
/applications/time/time-zone/config   --central-manager-time-zone="Europe/Lisbon"
--local-time-zone="Atlantic/Azores"
```

ERROR CODES

When executing a command, if no information is shown then the command runs successfully. An invalid operation will result in an error code information message displayed in the screen.

In an error case, any configurations made are cancelled and the user can be sure that nothing has been configured.

There are two types of errors:

- **Syntax errors**, Figure 231,

  Are shown to the user in red color and are easy to fix,

  Occur when the command is not correctly written:

  - Names are wrong;
  - Arguments have values out of bounds;

- There are missing arguments.

Figure 231. Syntax error

```
/cli/interfaces/gpon/status/SFPs> show
        Error: Missing mandatory argument 'port'!

Usage:
  SHOW                              Show details for an SFP entry from table gpon/status/show

    <MANDATORY>
    --port                            Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
    --slot                            Identifies a slot.
```

- **Operational errors**, Figure 185.
    - An invalid operation is ordered, for example, the user tries to disable a GPON interface that has remote equipments connected:
    - Errors more difficult to overcome since they often require the user to be aware of what he is doing and to have knowledge of the underlying protocols and mechanisms of operation.

Figure 232. Operational error

```
/cli> interfaces/gpon/config --slot=4 --admin=down --port=pon.1
Configuring Admin. State:
        Error: Family PON | ONT(s) active on this PON. | (0x0D030102) |
Returned error 0x0D030102
/cli>
```

WRITING CLI SCRIPTS

CLI allows the usage of configuration scripts.

Configuration scripts are ordered sequences of commands with a certain operational objective. Configuration scripts can be written and be 'pasted' in the CLI prompt as Plain text

Copy and paste at the CLI prompt is possible either for a single command or for a sequence of commands (Script) thus allowing the usage of scripts. Pressing enter after copying a command or script the CLI prompt will execute the given commands one by one.

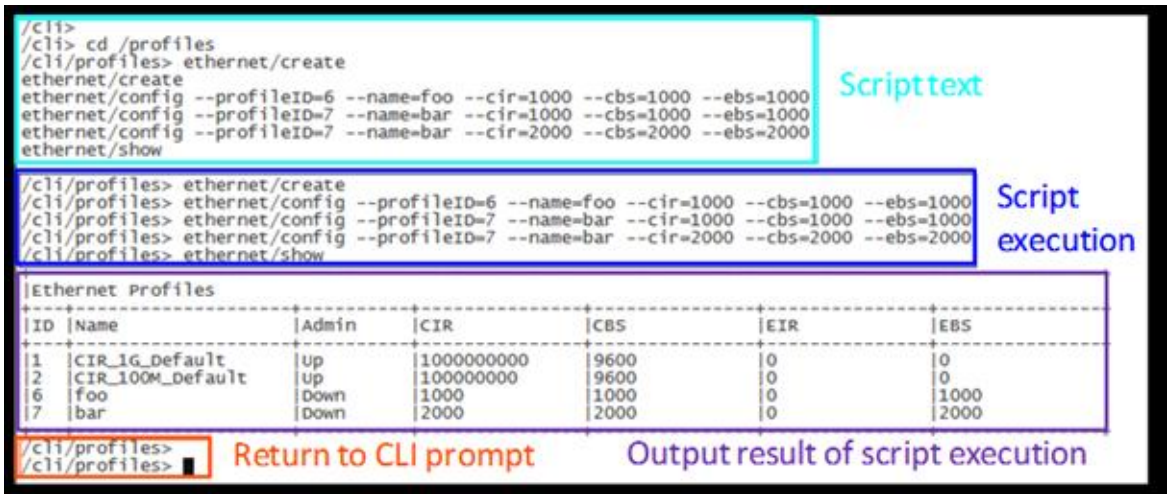
Scripts can have comments; comment lines start with the character '#'. Lines beginning with that character are ignored by CLI.

Configuration Script usage is exemplified below, Figure 233:

- In the red box is what the CLI Script the user pasted to the CLI prompt;

- In the yellow box is the Script Execution by CLI
- In the green box the output result of the script execution
- In the blue Box the user returns to the prompt.

Figure 233. CLI script usage example



PARTICULAR ARGUMENT CASES

ARGUMENTS slot and port

The arguments slot and port appear in almost every command, being in the majority of cases mandatory.

- **slot** is an integer that identifies a card slot in the OLT.

  To see the available slots and respective information the user can execute **/equipment/boards/show.**

- **port** argument identifies an interface inside a specific slot.

  Port argument syntax is port type name. port number, for example: eth.2 or pon.5 or voip.1

  - Port type name: eth/pon/voip/lag
  - Port number: integer

ARGUMENTS ID AND admin

- **ID:**

  The argument ID is a very common argument. Whenever this argument is present, there is also a show command available whose table will have an ID column.

  This argument is used to specify a single table entry for further configuration or information.

- **admin:**

  The admin argument is used to configure the administrative state of entities: interfaces, services, or others.

  The argument can take the value 'up' or 'down'.

Remote equipment – connect

The node **remote-eq** allows configuring and managing all the remote equipments.

In order to perform an operation on remote equipment, the following input parameters are used to identify the equipment:

- **slot** – an OLT card
- **port** – an interface in the given slot
- **ontID** – an unique ID for a remote equipment in the interface specified

Multiple configuration and management operations using the same set of values for this group may be required in the same remote equipment.

The **connect** command defines the three arguments (slot/port/ontID) and values in a single operation. A command in this node-sub-tree (remote equipment) uses this information as needed.

Configuration on a connected ONT with other different argument (Slot, Port, ontID) values than those defined in the initial connect command arguments, takes precedence over the information stored in the connect command.

CLI TREE

This section of the manual describes all the existing commands and respective arguments. It briefly explains the purpose of each command and, when appropriate, explains how to use the command.

This section numbering matches the CLI nodes tree for an easy navigation in the document.

The complete CLI structure is depicted in the text box below. The nodes are in bold and the commands within the nodes are preceded by the "@" symbol. The gray nodes and commands represent features that are not applicable to this equipment configuration. On the right side of the box there are links to the CLI description sub-section where the node or sub-node and commands detailed description can be found.

Figure 234. Complete CLI tree

```
/cli> tree
+ cli[@cd, @clear, @dir, @help, @mem, @quit, @show, @showconfig, @tree]
  + acl[@config, @create, @remove, @show, @showconfig]
    + interface[@add, @config, @remove]
    + network-service[@add, @config, @remove]
    + rule[@config, @remove]
    + rule-ipv4-ext[@config, @create, @show]
    + rule-ipv4-std[@config, @create, @show]
    + rule-ipv6-ext[@config, @create, @show]
    + rule-mac[@config, @create, @show]
  + applications[]
    + firmware-upgrade[]
      + files[@check, @config, @export, @import, @remove, @show, @status]
      + onu-upgrade[@apply-file, @availableValues, @execute]
    + manager[@config, @show]
    + olt-upgrade[@apply-file, @import]
    + time[]
      + ntp[@config, @create, @disable, @enable, @remove, @show, @showconfig]
      + time-zone[@availableValues, @config, @show, @showconfig]
  + backup-manager[@create, @del-serv-conf, @export, @import, @remove, @restore, @show]
  + cfm-probe[@config, @create, @remove, @show, @showconfig, @status]
    + unx-ccm[@remove, @show]
  + dhcp[]
    + dhcp-services[@config, @show, @showconfig]
    + global[@config, @show, @showconfig]
```

```
    + leases[@show]
  + equipment[@status]
    + boards[@config, @reboot, @show, @showconfig]
    + slot[@apply, @config, @show, @showconfig]
    + switch-fabric[@show, @switch, @update, @upgrade-sw]
    + system[@config, @reboot, @show, @showconfig]
  + erp-ring[@config, @create, @remove, @show, @showconfig]
    + status[@command, @show]
      + aps-channel[@show]
  + eth-protection[@command, @config, @create, @remove, @show, @showconfig, @status]
  + gpon-protection[@command, @config, @create, @remove, @show, @showconfig, @status]
  + interfaces[]
      + ethernet[@config, @show, @showconfig]
      + cos[@config, @show, @showconfig]
      + services[@add, @availableValues, @config, @remove, @show]
        + statistics[]
          + counters[@availableValues, @show, @show-active, @start, @stop]
          + dhcp[@show]
          + igmp[@show]
      + statistics[@show]
      + status[@show]
        + SFPs[@show]
        + active-channels[@show]
      + vlan[@config, @show, @showconfig]
    + gpon[@config, @show, @showconfig]
      + cos[@config, @show, @showconfig]
      + statistics[]
        + errors[@show]
        + ethernet[@show]
        + gpon[@show]
      + status[@show]
        + SFPs[@show]
        + rx-power[@read-all, @show]
    + lag[@config, @create, @remove, @show, @showconfig]
      + cos[@config, @show, @showconfig]
      + mapping[@attach, @availableValues, @detach]
```

```
      + statistics[@show]
      + status[@show]
    + rf-overlay[@config, @show, @showconfig]
      + status[@show]
  + ip[@apply, @save]
    + interfaces[]
      + inband[@config, @show, @showconfig]
      + ip[@config, @show, @showconfig]
    + networking[@config, @show, @showconfig]
    + route[@create, @remove, @show, @showconfig]
  + logs[]
    + alarms[@clear, @show]
  + mac-table[@config, @show, @showconfig]
    + status[]
      + gpon[@remove, @show]
      + switch[@remove, @show]
  + multicast[]
    + active-groups[@status]
    + group-list[@config, @create, @remove, @show, @showconfig]
    + probes[@config, @create, @remove, @show, @showconfig]
      + statistics[@show]
    + proxy[]
      + igmp-proxy[@config, @show, @showconfig]
      + querier[@config, @show, @showconfig]
  + profiles[]
    + ethernet[@config, @create, @remove, @show, @showconfig]
    + onu[@config, @create, @remove, @show, @showconfig]
    + pcp-priorities[@config, @create, @remove, @show, @showconfig]
    + upstream[@config, @create, @remove, @show, @showconfig]
    + voip[]
      + server[@availableValues, @config, @create, @remove, @show, @showconfig]
      + specific[@config, @create, @remove, @show, @showconfig]
  + remote-eq[@config-onu-id, @connect, @disconnect, @showconnected]
    + discovery[@change-reg-type, @command, @config, @create, @insert, @insert-all, @reboot, @reboot-
all, @remove, @remove-all, @show]
    + onu[@show]
      + analog-rf[@config, @show]
```

```
      + e1[@config-e1, @config-lsp, @config-pw, @show, @showconfig, @status]
      + ethernet[@config, @show]
      + ext-vlan-tag-op[@config, @show, @showconfig]
        + operation-table[@config, @create, @remove, @show, @showconfig]
      + ptp-source[@availableValues, @config, @create, @remove, @show]
      + services[@add, @availableValues, @config, @remove, @show]
        + t-cont-mapping[@config, @show, @showconfig]
      + system[@config, @show]
      + t-cont[@config, @create, @remove, @show, @showconfig]
      + voip[@config, @show]
    + statistics[]
      + fec[@show]
    + status[@show]
      + ethernet[]
        + statistics[@show]
      + firmware[@activate, @commit, @stop-transfer]
      + gem-port[]
        + statistics[@show]
      + services[@show]
        + active-channels[@show]
        + statistics[]
          + counters[@availableValues, @show, @show-active, @start, @stop]
          + dhcp[@show]
          + igmp[@show]
      + t-cont[@show]
  + services[@availableValues, @config, @create, @remove, @show, @showconfig]
    + rate-limiters[@config, @show, @showconfig]
    + statistics[]
      + counters[@availableValues, @show, @show-active, @start, @stop]
      + dhcp[@availableValues, @show]
      + igmp[@availableValues, @show]
  + synchronism[]
    + global[@config, @show, @showconfig]
      + sources[@availableValues, @config, @show]
    + ptp[@config, @show, @showconfig]
      + port[@availableValues, @config, @create, @remove, @show, @showconfig]
```

```
        + ip-access-list[@config, @create, @remove, @show]
    + status[]
      + global[@command, @show]
        + sources[@command, @show]
      + ptp[@show]
  + users[@config, @create, @remove, @show, @status]
```

NODES, SUB-NODES AND COMMANDS

“acl” node

Figure 235. “acl” node tree

```
/cli/acl> tree
+ acl[@config, @create, @remove, @show, @showconfig]
  + interface[@add, @config, @remove]
  + network-service[@add, @config, @remove]
  + rule[@config, @remove]
  + rule-ipv4-ext[@config, @create, @show]
  + rule-ipv4-std[@config, @create, @show]
  + rule-ipv6-ext[@config, @create, @show]
  + rule-mac[@config, @create, @show]
```

“config” command

Table 156. "config" command information

Name	config
Description	Configure parameters for an existing ACL.
Full path	/acl/config
Mandatory Parameters	--ID
Screen Output	No

Figure 236. CLI on line help on “config” command usage in this node context

```
/cli/acl> config ?

Usage:
 CONFIG                  Configure parameters for an existing ACL.

  <MANDATORY>
  --ID                   Identifies a table entry by ID, in this context.
```

```
[OPTIONAL]
--admin          Administrative State. Enable/disable, in this context. (enable|disable)
--name           Identifies the name of an ACL. (STRING 31)
--type           Identifies the type of an ACL. (mac|ipv4-std|ipv4-ext|ipv6-ext)
```

"create" command

Table 157. "create" command information

Name	create
Description	Create a new ACL.
Full path	/acl/create
Mandatory Parameters	--type
Screen Output	No

Figure 237. CLI on line help on "create" command usage in this node context

```
/cli/acl> create ?

Usage:
 CREATE              Create a new ACL.

  <MANDATORY>
  --type             Identifies the type of an ACL. (mac|ipv4-std|ipv4-ext|ipv6-ext)

  [OPTIONAL]
  --ID               Identifies a table entry by ID, in this context.
  --admin            Administrative State. Enable/disable, in this context. (enable|disable)
  --name             Identifies the name of an ACL. (STRING 31)
```

"remove" command

Table 158. "remove" command information

Name	remove
Description	Remove an existing ACL.
Full path	/acl/remove
Mandatory Parameters	-ID

Screen Output	No

Figure 238. CLI on line help on "remove" command usage in this node context

```
/cli/acl> remove ?

Usage:
 REMOVE                 Remove an existing ACL.

  <MANDATORY>
  --ID                  Identifies a table entry by ID, in this context.
```

"show" command

This command displays information on the current files configuration, in the format of a table.

Table 159. "show" command information

Name	show
Description	Show the current ACLs configured.
Full path	/acl/show
Mandatory Parameters	No mandatory parameters
Screen Output	Table Figure 240 Table parameters are described inTable 192

Figure 239. CLI on line help on "show" command usage in this node context

```
/cli/acl> show ?

Usage:
 SHOW                   Show the current ACLs configured.

  [OPTIONAL]
  --type                Identifies the type of an ACL. (mac|ipv4-std|ipv4-ext|ipv6-ext)
```

Figure 240.Output of ”show” command without arguments in this node context

```
/cli/acl> show
+-------------------------------------------------------------------------------------------------------------+
|Access Control List                                                                                          |
+-------------------------------------------------------------+-----------------+-----------+----------------+
|                                                             |Association      |Interfaces |Network Services|
+------+----------+---------+-------------------------------+---------+-------+----+------+----------------+
|ACL ID|Type      |Rules    |Name                           |Direction|Admin  |Slot|Port  |IDs             |
+------+----------+---------+-------------------------------+---------+-------+----+------+----------------+
|1     |MAC       |1        |ACL_M_L1                       |In       |disable|2   |Eth 4 |                |
|3     |MAC       |0        |                               |--       |--     |--  |--    |--              |
|2     |IPv4 STD  |1        |ACL_IPv4_S_1                   |In       |disable|    |      |1               |
+------+----------+---------+-------------------------------+---------+-------+----+------+----------------+
```

Table 160. “show” command output table parameters

Parameter Group	Parameter	Description
	ACL ID	ACL identification (number)
	Type	ACL type (text)
	Rules	Number of existing rules for the ACL ID table entry (number)
	Name	ACL name (text)
Association	Direction	Traffic direction subject to ACL
	Admin	ACL Administraticve status
Interfaces	Slot	Line card slot number of the port associated to ACL
	Port	ACL associated Port
Network Services	IDs	ACL Associated Services’ID

“showconfig” command

Table 161. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/acl/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 241. CLI on line help on “showconfig” command usage in this node context

```
/cli/acl> showconfig ?

Usage:
  SHOWCONFIG                Print the command list that enforces the current configuration
```

“interface” sub-node

“add” command

Table 162. "add" command information

Name	add
Description	Associate a given Interface to an ACL.
Full path	/acl/interface/add
Mandatory Parameters	--acl-id --port --slot
Screen Output	No

Figure 242. CLI on line help on “add” command usage in this node context

```
/cli/acl/interface> add ?

Usage:
  ADD                  Associate a given Interface to an ACL

  <MANDATORY>
  --acl-id             Identifies an ACL by ID, in this context.
  --port               Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slot               Identifies a slot.

  [OPTIONAL]
  --admin              Administrative State. Enable/disable, in this context. (enable|disable)
  --direction          Identifies an ACL Rule by ID, in this context.
```

“config” command

Table 163. "config" command information

Name	config
Description	Configure an existing Interface association.
Full path	/acl/interface/config
Mandatory Parameters	--acl-id --port --slot
Screen Output	No

Figure 243. CLI on line help on "config" command usage in this node context

```
/cli/acl/interface> config ?

Usage:
  CONFIG                  Configure an existing Interface association.

   <MANDATORY>
   --acl-id               Identifies an ACL by ID, in this context.
   --port                 Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
   --slot                 Identifies a slot.

   [OPTIONAL]
   --admin                Administrative State. Enable/disable, in this context. (enable|disable)
   --direction            Identifies an ACL Rule by ID, in this context.
```

"remove" command

Table 164. "remove" command information

Name	remove
Description	Remove an existing Interface association.
Full path	/acl/interface/remove
Mandatory Parameters	--acl-id --port --slot
Screen Output	No

Figure 244. CLI on line help on "remove" command usage in this node context

```
/cli/acl/interface> remove ?

Usage:
  REMOVE                  Remove an existing Interface association

   <MANDATORY>
   --acl-id               Identifies an ACL by ID, in this context.
   --port                 Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
   --slot                 Identifies a slot.
   <MANDATORY>
```

--ID	Identifies a table entry by ID, in this context.

“network-service” sub-node

“add” command

Table 165. "add" command information

Name	add
Description	Associate a given Network Service to an ACL.
Full path	/acl/network-service/add
Mandatory Parameters	--acl-id --serviceID
Screen Output	No

Figure 245. CLI on line help on “add” command usage in this node context

```
/cli/acl/network-service> add ?

Usage:
  ADD                  Associate a given Network Service to an ACL

  <MANDATORY>
  --acl-id             Identifies an ACL by ID, in this context.
  --serviceID          Select an OLT service by ID.

  [OPTIONAL]
  --admin              Administrative State. Enable/disable, in this context. (enable|disable)
  --direction          Identifies an ACL Rule by ID, in this context.
```

“config” command

Table 166. "config" command information

Name	config
Description	Configure an existing Network Service association.
Full path	/acl/network-service/config
Mandatory Parameters	--acl-id --serviceID
Screen Output	No

Figure 246. CLI on line help on "config" command usage in this node context

```
/cli/acl/network-service> config ?

Usage:
  CONFIG                  Configure an existing Network Service association

   <MANDATORY>
   --acl-id               Identifies an ACL by ID, in this context.
   --serviceID             Select an OLT service by ID.

   [OPTIONAL]
   --admin                Administrative State. Enable/disable, in this context. (enable|disable)
   --direction            Identifies an ACL Rule by ID, in this context.
```

"remove" command

Table 167. "remove" command information

Name	remove
Description	Remove an existing Network Service association.
Full path	/acl/network-service/remove
Mandatory Parameters	--acl-id --serviceID
Screen Output	No

Figure 247. CLI on line help on "remove" command usage in this node context

```
/cli/acl/network-service> remove ?

Usage:
  REMOVE                  Remove an existing Network Service association

   <MANDATORY>
   --acl-id               Identifies an ACL by ID, in this context.
   --serviceID             Select an OLT service by ID.
```

“rule” sub-node

“config” command

Table 168. "config" command information

Name	config
Description	Configure any shared rule parameters
Full path	/acl/rule/config
Mandatory Parameters	--acl-id --rule-id
Screen Output	No

Figure 248. CLI on line help on “config” command usage in this node context

```
/cli/acl/rule> config ?

Usage:
  CONFIG                  Configure any shared rule parameters

   <MANDATORY>
   --acl-id               Identifies an ACL by ID, in this context.
   --rule-id              Identifies an ACL Rule by ID, in this context.

   [OPTIONAL]
   --action               permit or deny
   --admin                 Administrative State. Enable/disable, in this context. (enable|disable)
   --name                  Set a name for a specific Rule (STRING 31)
```

“remove” command

Table 169. "remove" command information

Name	remove
Description	Remove an existing rule.
Full path	/acl/rule/remove
Mandatory Parameters	--acl-id --rule-id
Screen Output	No

Figure 249. CLI on line help on "remove" command usage in this node context

```
/cli/acl/rule> remove ?

Usage:
 REMOVE                  Remove an existing rule

  <MANDATORY>
  --acl-id               Identifies an ACL by ID, in this context.
  --rule-id              Identifies an ACL Rule by ID, in this context.
```

"rule-ipv4-ext" sub-node

"config" command

Table 170. "config" command information

Name	config
Description	Configure an existing IPv4 Extended Rule.
Full path	/acl/rule-ipv4-ext/config
Mandatory Parameters	--acl-id --rule-id
Screen Output	No

Figure 250. CLI on line help on "config" command usage in this node context

```
/cli/acl/rule-ipv4-ext> config ?

Usage:
 CONFIG                  Configure an existing IPv4 Extended Rule.

  <MANDATORY>
  --acl-id               Identifies an ACL by ID, in this context.
  --rule-id              Identifies an ACL Rule by ID, in this context.

  [OPTIONAL]
  --action               permit or deny
  --admin                Administrative State. Enable/disable, in this context. (enable|disable)
  --dscp                 Match the DSCP value. (not-used|0..63)
```

```
  --dst-ipv4-addr          Destination IPv4 Address
  --dst-ipv4-mask          Destination IPv4 Mask
  --dst-port-end           Specify Destination L4 port number (not-used|0..65535)
  --dst-port-start         Specify Destination L4 port number (not-used|0..65535)
  --name                   Set a name for a specific Rule (STRING 31)
  --precedence             Match IP precedence value (not-used|0..7)
  --protocol               Match the protocol number. Protocol field of the IPv4 header. (not-
used|0..255)
  --src-ipv4-addr          Source IPv4 Address
  --src-ipv4-mask          Source IPv4 Mask
  --src-port-end           Specify Source L4 port number (not-used|0..65535)
  --src-port-start         Specify Source L4 port number (not-used|0..65535)
  --tos                    Specify match condition based on IP TOS Mask value. Two-digit
hexadecimal number (0000..0XFF)
  --tos-mask               Specify match condition based on IP TOS value. Two-digit hexadecimal
number (0000..0XFF)
```

“create” command

Table 171. "create" command information

Name	create
Description	Create a new IPv4 Extended Rule for a given ACL ID.
Full path	/acl/rule-ipv4-ext/create
Mandatory Parameters	--acl-id --action
Screen Output	No

Figure 251. CLI on line help on “create” command usage in this node context

```
/cli/acl/rule-ipv4-ext> create ?

Usage:
 CREATE                  Create a new IPv4 Extended Rule for a given ACL ID.

  <MANDATORY>
  --acl-id               Identifies an ACL by ID, in this context.
  --action               permit or deny

  [OPTIONAL]
```

```
  --admin                 Administrative State. Enable/disable, in this context. (enable|disable)
  --dscp                  Match the DSCP value. (not-used|0..63)
  --dst-ipv4-addr         Destination IPv4 Address
  --dst-ipv4-mask         Destination IPv4 Mask
  --dst-port-end          Specify Destination L4 port number (not-used|0..65535)
  --dst-port-start        Specify Destination L4 port number (not-used|0..65535)
  --name                  Set a name for a specific Rule (STRING 31)
  --precedence            Match IP precedence value (not-used|0..7)
  --protocol              Match the protocol number. Protocol field of the IPv4 header. (not-
used|0..255)
  --rule-id               Identifies an ACL Rule by ID, in this context.
  --src-ipv4-addr         Source IPv4 Address
  --src-ipv4-mask         Source IPv4 Mask
  --src-port-end          Specify Source L4 port number (not-used|0..65535)
  --src-port-start        Specify Source L4 port number (not-used|0..65535)
  --tos                   Specify match condition based on IP TOS Mask value. Two-digit
hexadecimal number (0000..0XFF)
  --tos-mask              Specify match condition based on IP TOS value. Two-digit hexadecimal
number (0000..0XFF)
```

"show" command

Table 172. "show" command information

Name	show
Description	Show the current IPv4 Extended Rules configured.
Full path	/acl/rule-ipv4-ext/show
Mandatory Parameters	No mandatory parameters
Screen Output	Table, Figure 253. Table parameters description in Table 205.

Figure 252. CLI on line help on "show" command usage in this node context

```
/cli/acl/rule-ipv4-ext> show ?

Usage:
  SHOW                  Show the current IPv4 Extended Rules configured.

   [OPTIONAL]
   --acl-id             Identifies an ACL by ID, in this context.
```

Figure 253.Output of ”show” command without arguments in this node context

```
/cli/acl/rule-ipv4-ext> show
+-------------------------------------------------------------------------------------------------+
|IPv4 Extended Rules                                                                              |
+-------+-------+---------+-------+--------------------+-----------------------------------------+
|ACL ID |Rule ID|Admin    |Action |Parameter           |Value                                    |
+-------+-------+---------+-------+--------------------+-----------------------------------------+
+-------+-------+---------+-------+--------------------+-----------------------------------------+
/cli/acl/rule-ipv4-ext>
```

Table 173. “show” command output table parameters

Parameter	Description
ACL ID	ACL identification (number)
Rule ID	Rule identification (number)
Admin	ACL Administraticve status
Action	Action implemented by the rule (permit|deny)
Parameter	
Value	

“rule-ipv4-std” sub-node

“config” command

Table 174. "config" command information

Name	config
Description	Configure an existing IPv4 Standard Rule.
Full path	/acl/rule-ipv4-std/config
Mandatory Parameters	--acl-id --rule-id
Screen Output	No

Figure 254. CLI on line help on “config” command usage in this node context

```
/cli/acl/rule-ipv4-std> config ?

Usage:
  CONFIG                  Configure an existing IPv4 Standard Rule.

  <MANDATORY>
  --acl-id                Identifies an ACL by ID, in this context.
  --rule-id               Identifies an ACL Rule by ID, in this context.
```

```
  [OPTIONAL]
  --action              permit or deny
  --admin               Administrative State. Enable/disable, in this context. (enable|disable)
  --name                Set a name for a specific Rule (STRING 31)
  --src-ipv4-addr         Source IPv4 Address
  --src-ipv4-mask         Source Wildcard Mask
```

"create" command

Table 175. "create" command information

Name	create
Description	Create a new IPv4 Standard Rule for a given ACL ID.
Full path	/acl/rule-ipv4-std/create
Mandatory Parameters	--acl-id --action
Screen Output	No

Figure 255. CLI on line help on "create" command usage in this node context

```
/cli/acl/rule-ipv4-std> create ?

Usage:
  CREATE                Create a new IPv4 Standard Rule for a given ACL ID.

  <MANDATORY>
  --acl-id              Identifies an ACL by ID, in this context.
  --action              permit or deny

  [OPTIONAL]
  --admin               Administrative State. Enable/disable, in this context. (enable|disable)
  --name                Set a name for a specific Rule (STRING 31)
  --rule-id             Identifies an ACL Rule by ID, in this context.
  --src-ipv4-addr         Source IPv4 Address
  --src-ipv4-mask         Source Wildcard Mask
```

“show” command

Table 176. "show" command information

Name	show
Description	Show the current IPv4 Standard Rules configured.
Full path	/acl/rule-ipv4-std/show
Mandatory Parameters	No mandatory parameters
Screen Output	Table, Figure 257. Table parameters description in Table 177.

Figure 256. CLI on line help on “show” command usage in this node context

```
/cli/acl/rule-ipv4-std> show ?

Usage:
  SHOW                    Show the current IPv4 Standard Rules configured.

   [OPTIONAL]
   --acl-id               Identifies an ACL by ID, in this context.
```

Figure 257.Output of ”show” command without arguments in this node context

```
/cli/acl/rule-ipv4-std> show
+-------------------------------------------------------------------------------------------+
|IPv4 Standard Rules                                                                        |
+-------+-------+----------------+---------+-------+-----------------+-----------------+
|ACL ID |Rule ID|Rule Name       |Admin    |Action |Source IP        |Source Mask      |
+-------+-------+----------------+---------+-------+-----------------+-----------------+
|2      |1      |                |disable  |permit |0.0.0.0          |0.0.0.0          |
+-------+-------+----------------+---------+-------+-----------------+-----------------+
```

Table 177. “show” command output table parameters

Parameter	Description
ACL ID	ACL identification (number)
Rule ID	Rule identification (number)
Admin	ACL Administraticve status
Action	Action implemented by the rule (permit|deny)
Source IP	Source IPv4 address
Source Mask	Source IPv4 mask

“rule-ipv6-ext” sub-node

“config” command

Table 178. "config" command information

Name	config
Description	Configure an existing IPv6 Extended Rule.
Full path	/acl/rule-ipv6-ext/config
Mandatory Parameters	--acl-id --rule-id
Screen Output	No

Figure 258. CLI on line help on “config” command usage in this node context

```
/cli/acl/rule-ipv6-ext> config ?

Usage:
  CONFIG                  Configure an existing IPv6 Extended Rule.

   <MANDATORY>
   --acl-id               Identifies an ACL by ID, in this context.
   --rule-id              Identifies an ACL Rule by ID, in this context.

   [OPTIONAL]
   --action               permit or deny
   --admin                Administrative State. Enable/disable, in this context. (enable|disable)
   --dscp                 Match the DSCP value. (not-used|0..63)
   --dst-ipv6-addr        Destination IPv6 Address
   --dst-ipv6-prefix      Destination IPv6 prefix length (0..128)
   --dst-port-end         Specify Destination L4 port number (not-used|0..65535)
   --dst-port-start       Specify Destination L4 port number (not-used|0..65535)
   --flow-label           Match IPv6 flow label field (not-used|0..1048575)
   --name                 Set a name for a specific Rule (STRING 31)
   --protocol             Match the protocol number. Protocol field of the IPv4 header. (not-
used|0..255)
   --src-ipv6-addr        Source IPv6 Address
   --src-ipv6-prefix      Source IPv6 prefix length (0..128)
   --src-port-end         Specify Source L4 port number (not-used|0..65535)
```

```
  --src-port-start          Specify Source L4 port number (not-used|0..65535)
```

“create” command

Table 179. "create" command information

Name	create
Description	Create a new IPv6 Extended Rule for a given ACL ID.
Full path	/acl/rule-ipv6-ext/create
Mandatory Parameters	--acl-id --action
Screen Output	No

Figure 259. CLI on line help on “create” command usage in this node context

```
/cli/acl/rule-ipv6-ext> create ?

Usage:
 CREATE                  Create a new IPv6 Extended Rule for a given ACL ID.

  <MANDATORY>
  --acl-id               Identifies an ACL by ID, in this context.
  --action               permit or deny

  [OPTIONAL]
  --admin                Administrative State. Enable/disable, in this context. (enable|disable)
  --dscp                 Match the DSCP value. (not-used|0..63)
  --dst-ipv6-addr        Destination IPv6 Address
  --dst-ipv6-prefix      Destination IPv6 prefix length (0..128)
  --dst-port-end         Specify Destination L4 port number (not-used|0..65535)
  --dst-port-start       Specify Destination L4 port number (not-used|0..65535)
  --flow-label           Match IPv6 flow label field (not-used|0..1048575)
  --name                 Set a name for a specific Rule (STRING 31)
  --protocol             Match the protocol number. Protocol field of the IPv4 header. (not-
used|0..255)
  --rule-id              Identifies an ACL Rule by ID, in this context.
  --src-ipv6-addr        Source IPv6 Address
  --src-ipv6-prefix      Source IPv6 prefix length (0..128)
  --src-port-end         Specify Source L4 port number (not-used|0..65535)
```

--src-port-start	Specify Source L4 port number (not-used|0..65535)

"show" command

Table 180. "show" command information

Name	show
Description	Show the current IPv6 Extended Rules configured.
Full path	/acl/rule-ipv6-ext/show
Mandatory Parameters	No mandatory parameters
Screen Output	Table, Figure 261. Table parameters description in Table 181.

Figure 260. CLI on line help on "show" command usage in this node context

```
/cli/acl/rule-ipv6-ext> show ?

Usage:
  SHOW                  Show the current IPv6 Extended Rules configured.

  [OPTIONAL]
  --acl-id              Identifies an ACL by ID, in this context.
```

Figure 261.Output of "show" command without arguments in this node context

```
/cli/acl/rule-ipv6-ext> show
+-------------------------------------------------------------------------------------------------------------+
|IPv6 Extended Rules                                                                                          |
+-------+-------+---------+-------+--------------------+-----------------------------------------------------+
|ACL ID |Rule ID|Admin    |Action |Parameter           |Value                                                |
+-------+-------+---------+-------+--------------------+-----------------------------------------------------+
+-------+-------+---------+-------+--------------------+-----------------------------------------------------+
/cli/acl/rule-ipv6-ext>
```

Table 181. "show" command output table parameters

Parameter	Description
ACL ID	ACL identification (number)
Rule ID	Rule identification (number)
Admin	ACL Administraticve status
Action	Action implemented by the rule (permit|deny)
Parameter	
Value	

“rule-mac” sub-node

“config” command

Table 182. "config" command information

Name	config
Description	Configure an existing MAC Rule.
Full path	/acl/rule-mac/config
Mandatory Parameters	--acl-id --rule-id
Screen Output	No

Figure 262. CLI on line help on “config” command usage in this node context

```
/cli/acl/rule-mac> config ?

Usage:
  CONFIG                  Configure an existing MAC Rule.

   <MANDATORY>
   --acl-id               Identifies an ACL by ID, in this context.
   --rule-id              Identifies an ACL Rule by ID, in this context.

   [OPTIONAL]
   --action               permit or deny
   --admin                Administrative State. Enable/disable, in this context. (enable|disable)
   --cos                  Match condition based on the CoS value (not-used|0..7)
   --dst-mac-addr         Destination MAC address in the format [AA:BB:CC:DD:EE:FF]
   --dst-mac-mask         Destination MAC mask in the format [AA:BB:CC:DD:EE:FF]
   --ethernet-type        Four-digit hexadecimal number to specify an 'Ethertype' value (not-
used|0X600..0XFFFF)
   --name                 Set a name for a specific Rule (STRING 31)
   --src-mac-addr         Source MAC address in the format [AA:BB:CC:DD:EE:FF]
   --src-mac-mask         Source MAC mask in the format [AA:BB:CC:DD:EE:FF]
```

“create” command

Table 183. "create" command information

Name	create
Description	Create a new MAC Rule for a given ACL ID.
Full path	/acl/rule-mac/create
Mandatory Parameters	--acl-id --action
Screen Output	No

Figure 263. CLI on line help on “create” command usage in this node context

```
/cli/acl/rule-mac> create ?

Usage:
  CREATE                  Create a new MAC Rule for a given ACL ID.

   <MANDATORY>
   --acl-id               Identifies an ACL by ID, in this context.
   --action               permit or deny

   [OPTIONAL]
   --admin                Administrative State. Enable/disable, in this context. (enable|disable)
   --cos                  Match condition based on the CoS value (not-used|0..7)
   --dst-mac-addr         Destination MAC address in the format [AA:BB:CC:DD:EE:FF]
   --dst-mac-mask         Destination MAC mask in the format [AA:BB:CC:DD:EE:FF]
   --ethernet-type        Four-digit hexadecimal number to specify an 'Ethertype' value (not-
used|0X600..0XFFFF)
   --name                 Set a name for a specific Rule (STRING 31)
   --rule-id              Identifies an ACL Rule by ID, in this context.
   --src-mac-addr         Source MAC address in the format [AA:BB:CC:DD:EE:FF]
   --src-mac-mask         Source MAC mask in the format [AA:BB:CC:DD:EE:FF]
```

“show” command

Table 184. "show" command information

Name	show
Description	Show the current MAC Rules configured.
Full path	/acl/rule-mac/show
Mandatory Parameters	No mandatory parameters
Screen Output	Table, Figure 261. Table parameters description in Table 181.

Figure 264. CLI on line help on “show” command usage in this node context

```
/cli/acl/rule-mac> show ?

Usage:
 SHOW                    Show the current MAC rules configured.

  [OPTIONAL]
  --acl-id               Identifies an ACL by ID, in this context.
```

Figure 265.Output of ”show” command without arguments in this node context

```
/cli/acl/rule-mac> show
+-------------------------------------------------------------------------------------------------------------------------------------------------------------------+
|MAC Rules                                                                                                                                                          |
+--------+-------+----------------+-------+------+----------+--------+-----------------+-----------------+-----------------+-----------------+
|ACL ID |Rule ID|Rule Name       |Admin  |Action|Eth-Type  |CoS     |Source MAC Addr  |Source MAC Mask  |Destination MAC Addr|Destination MAC Mask|
+-------+-------+----------------+-------+------+----------+--------+-----------------+-----------------+-----------------+-----------------+
|1      |1      |Teste           |enable |permit|not-used  |not-used|00:00:00:00:00:00 |00:00:00:00:00:00 |00:00:00:00:00:00   |00:00:00:00:00:00   |
+-------+-------+----------------+-------+------+----------+--------+-----------------+-----------------+-----------------+-----------------+
```

Table 185. “show” command output table parameters

Parameter	Description
ACL ID	ACL identification (number)
Rule ID	Rule identification (number)
Name	Rule Name (text)
Admin	ACL Administraticve status
Action	Action implemented by the rule (permit|deny)
Eth-Type	Four-digit hexadecimal number to specify an 'Ethertype' value (not-used|0X600..0XFFFF)
CoS	Match condition based on the CoS value (not-used|0..7)
Source MAC Addr	Source MAC address
Source MAC Mask	Source MAC mask
Destination MAC Addr	Destination MAC address
Destination MAC Mask	Destination MAC mask

"applications" node

Figure 266. "applications" node tree

```
/cli/applications> tree
+ applications[]
  + firmware-upgrade[]
    + files[@check, @config, @export, @import, @remove, @show, @status]
    + onu-upgrade[@apply-file, @availableValues, @execute]
  + manager[@config, @show, @showconfig]
  + olt-upgrade[@apply-file, @import]
  + time[]
    + ntp[@config, @create, @disable, @enable, @remove, @show, @showconfig]
    + time-zone[@availableValues, @config, @show, @showconfig]
```

"firmware-upgrade" sub-node

This sub-node can be used to update the firmware of several ONTs in one operation (in **/applications/firmware-upgrade/onu-upgrade** node).

The **/applications/firmware-upgrade/files** node is used to manage the local firmware repository.

"files" sub-node

"check" command

Table 186. "check" command information

Name	check
Description	Calculates MD5SUM for all files to check for inconsistencies..
Full path	/applications/firmware-upgrade/files/check
Mandatory Parameters	This command has no parameters
Screen Output	No

Figure 267. CLI on line help on "check" command usage in this node context

```
/cli/applications> firmware-upgrade/files/check ?


Usage:
 CHECK        Calculate MD5SUM for all files to check for inconsistencies.
```

"config" command

Table 187. "config" command information

Name	config
Description	Configures usage by the system of existing configuration files in the repository
Full path	/applications/firmware-upgrade/files/config
Mandatory Parameters	--fileID
Screen output	No

Figure 268. CLI on line help on "config" command usage in this node context

```
/cli/applications/firmware-upgrade/files> config ?

Usage:
  CONFIG         Configure information for a given file ID.

  <MANDATORY>
  --fileID    Identifies a file by ID, in this context.

  [OPTIONAL]
  --description   Set a description, in this context.
  --hw-version   Set the hardware version for a given file.
  --profileID     Identifies a profile by ID.
  --set-default   Set the default file for the 'auto' upgrade option. (true|false)
  --sw-version   Set the software version for a given file.
```

"export" command

Table 188. "export" command information

Name	export
Description	Sends an existing file to a TFTP server.
Full path	/applications/firmware-upgrade/files/export
Mandatory Parameters	--ip-address
Screen output	No

Figure 269. . CLI on line help on "export" command usage in this node context

```
/cli/applications/firmware-upgrade/files> export ?

Usage:
 EXPORT        Send an existing file to a TFTP server.

  <MANDATORY>
  --ip-address    IPv4 address

  [OPTIONAL]
  --file-name     Specify the file name, in this context.
  --fileID    Identifies a file by ID, in this context.
```

"import" command

Table 189. "import" command information

Name	import
Description	Imports a new file from a TFTP server.
Full path	/applications/firmware-upgrade/files/import
Mandatory Parameters	--ip-address
Screen output	No

Figure 270. . CLI on line help on "import" command usage in this node context

```
/cli/applications/firmware-upgrade/files> import ?

Usage:
 IMPORT        Import a new file from a TFTP server

  <MANDATORY>
  --file-name     Specify the file name, in this context.
  --ip-address    IPv4 address
  --profileID     Identifies a profile by ID.

  [OPTIONAL]
  --description   Set a description, in this context.
```

```
--hw-version  Set the hardware version for a given file.
--sw-version  Set the software version for a given file.
```

"remove" command

Table 190. "remove" command information

Name	remove
Description	Removes an existing file from the repository.
Full path	/applications/firmware-upgrade/files/remove
Mandatory Parameters	No mandatory parameters
Screen Output	No

Figure 271. . CLI on line help on "remove" command usage in this node context

```
/cli/applications/firmware-upgrade/files> remove ?

Usage:
 REMOVE        Remove an existing file from the repository.

  [OPTIONAL]
  --file-name    Specify the file name, in this context.
  --fileID   Identifies a file by ID, in this context.
```

"show" command

Table 191. "show" command information

Name	show
Description	Shows the current ONU firmware files.
Full path	/applications/firmware-upgrade/files/show
Mandatory Parameters	No mandatory parameters
Screen Ouput	Table, Figure 273 and Figure 274. Table parameters are described in Table 192.

Figure 272. . CLI on line help on "show" command usage in this node context

```
/cli/applications/firmware-upgrade/files> show ?

Usage:
 SHOW          Show the current ONU firmware files.

  [OPTIONAL]
  --fileID    Identifies a file by ID, in this context.
```

Figure 273.Output of "show" command without arguments in this node context

```
/cli/applications/firmware-upgrade/files> show
+-----------------------------------------------------------------------------------------------------------------------------------------------------------+
|Files List
+---+-------------------------------+------------+-------+-------------------------+---------------+---------------+------------+
|ID |Name                           |Size (Bytes)|Default|ONU Profile (ID) Name    |SW version     |HW version     |Description
+---+-------------------------------+------------+-------+-------------------------+---------------+---------------+------------+
|1  |NT7SW03010001                  |0           |NO     |(1) SFU                  |3NT7SW03010001 |3NT7SFU1223A03 |
|2  |NT7SW030100A1                  |0           |NO     |(1) SFU                  |3NT7SW030100A1 |3NT7SFU1223A03 |
|3  |NT7SW030100B1                  |1420317     |NO     |(1) SFU                  |3NT7SW030100B1 |               |
|4  |NT7SW0000005K                  |1347556     |NO     |(0) No Profile           |3NT7SW0000005K |               |
|5  |NT7SW00000A5K                  |0           |NO     |(3) MBH                  |3NT7SW00000A5K |               |
|6  |bcm968500GWOV_nand_fs_image_12|11534356    |NO     |(0) No Profile           |RGW-2.2.0sp2A  |               |
+---+-------------------------------+------------+-------+-------------------------+---------------+---------------+------------+
```

This command displays information on the current files configuration, in the format of a table.

Table 192. "show" command output table parameters

Parameter	Description
ID	File identification (number)
Name	File name (text)
Size (Bytes)	File size (Bytes)
Default	Identifies if the file is the default file (Yes|No)
(ID) ONT Profile Name	(ONT Profile ID (number)) ONT Profile Name (text)
SW version	Software version (text)
HW version	Hardware version (text)
Description	File description (text)
MD5 Sum	File MD5 Sum calculated value (only displayed when the command is executed with a specific file as argument)

Figure 274. Output of "show" command with argument fileID in this node context

```
/cli/applications/firmware-upgrade/files> show --fileID=6
+-----------------------------------------------------------
|File 6 - 'bcm968500GWOV_nand_fs_image_128.w'
+-----------------------+-----------------------------------
|Parameter              |Value
+-----------------------+-----------------------------------
|ID                     |6
|Name                   |bcm968500GWOV_nand_fs_image_128.w
|Size (Bytes)           |11534356
|Default                |NO
|ONU Profile (ID) Name  |(0) No Profile
|SW version             |RGW-2.2.0sp2A
|HW version             |
|Description            |
|MD5 Sum                |d3614e1628f69f63dce5c77020c45e2f
+-----------------------+-----------------------------------
```

"status" command

Table 193. "status" command information

Name	status
Description	Display existing problems with the file repository.
Full path	/applications/firmware-upgrade/files/status
Mandatory Parameters	No parameters
Screen Ouput	Table, Figure 276. Table parameters are described in Table 194.

Figure 275. . CLI on line help on "status" command usage in this node context

```
/cli/applications/firmware-upgrade/files> status ?

Usage:
  STATUS        Display existing problems with the file repository
```

Figure 276. Output of ”status” command in this node context

```
/cli/applications/firmware-upgrade/files> status
+-------------------------------------------------------------------------------
|Files List
+---+----------------------------------------+--------------------+----------
|ID |Name                                    |Status              |Solution
+---+----------------------------------------+--------------------+----------
|1  |NT7SW03010001                           |OK                  |--
|2  |NT7SW030100A1                           |OK                  |--
|3  |NT7SW030100B1                           |OK                  |--
|4  |NT7SW0000005K                           |OK                  |--
|5  |NT7SW00000A5K                           |OK                  |--
|6  |bcm968500GWOV_nand_fs_image_128.w       |OK                  |--
+---+----------------------------------------+--------------------+----------
```

Table 194. “status” command output table parameters

Parameter	Description
ID	File identification (number)
Name	File name (text)
Status	File status. If Ok no problem exists with the file
Solution	Proposed solution for the identified problem

“onu-upgrade” sub-node

“apply-file” command

The command apply-file must ask for user confirmation before running.

If neither 'commit' nor 'activate' parameters are used in the command line or if both parameters are used but set to the <disable> value, the image is only downloaded into the ONU.

Table 195. "apply-file" command information

Name	apply-file
Description	Sends a specified firmware version to a specific ONU, or all ONUs in a specific <slot-port>.
Full path	/applications/firmware-upgrade/onu-upgrade/ apply-file
Mandatory Parameters	--fileID
Screen Output	No

Figure 277. CLI on line help on “apply-file” command usage in this node context

```
/cli/applications/firmware-upgrade/onu-upgrade> apply-file ?


Usage:
  APPLY-FILE      Send a specified firmware version to a specific ONU, or all ONUs in a
```

```
specific <slot-port>.

  <MANDATORY>
  --fileID    Identifies a file by ID, in this context.

  [OPTIONAL]
  --activate The ONU reboots and starts up with this image. The default boot image is  not
modified. (enable|disable)
  --commit This image will be set to be the default boot image. (enable|disable)
  --onuID   Identifies an ONU by ID. (Not used means all ONUs)
  --port      Identifies an interface on the given slot. (only PON interfaces are available.
   Not used means all PONs)
  --slot Identifies a slot. (Not used means all Slots)
```

"availableValues" command

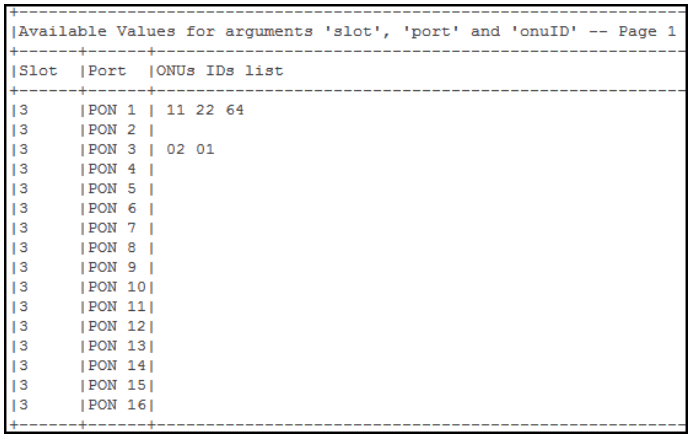
Table 196. "availableValues" command information

Name	availableValues
Description	Shows available options for each argument.
Full path	/applications/firmware-upgrade/onu-upgrade/ availableValues
Mandatory Parameters	No
Screen Output	Table, Figure 279. Table parameters are described in Table 197

Figure 278. CLI on line help on "availableValues" command usage in this node context

```
/cli/applications/firmware-upgrade/onu-upgrade> availableValues ?

Usage:
  AVAILABLEVALUES   Show available options for each argument.

  [OPTIONAL]
  --port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot. (not used for LAG)       Not used means all PONs)
```

Figure 279. Output of ”availableValues” command in this node context



```
+-------------------------------------------------------------------
|Available Values for arguments 'slot', 'port' and 'onuID' -- Page 1
+------+------+------------------------------------------------------
|Slot  |Port  |ONUs IDs list
+------+------+------------------------------------------------------
|3     |PON 1 | 11 22 64
|3     |PON 2 |
|3     |PON 3 | 02 01
|3     |PON 4 |
|3     |PON 5 |
|3     |PON 6 |
|3     |PON 7 |
|3     |PON 8 |
|3     |PON 9 |
|3     |PON 10|
|3     |PON 11|
|3     |PON 12|
|3     |PON 13|
|3     |PON 14|
|3     |PON 15|
|3     |PON 16|
+------+------+------------------------------------------------------
```

Table 197. “availableValues” command output table parameters

Parameter	Description
Slot	Used slots in the system
Port	Used PON interfaces
ONUs IDs list	List of ONUs per PON interface

“execute” command

Table 198. "execute" command information

Name	execute
Description	Updates firmware on all the ONUs in the given <slot,port>.
Full path	/applications/firmware-upgrade/onu-upgrade/execute
Mandatory Parameters	No
Screen Output	No

Figure 280. CLI on line help on “execute” command usage in this node context

```
/cli/applications> firmware-upgrade/onu-upgrade/execute ?

Usage:
 EXECUTE       Will update firmware on all the ONUs in the given <slot,port>.

  [OPTIONAL]
  --auto    Send firmware to all ONUs that have software version set to 'auto'.
   (enable|disable)
  --planned Send firmware to all ONUs that have software version set to 'planned'.
```

```
(enable|disable)
--port      Identifies an interface on the given slot. (only PON interfaces are available.
Not used means all PONs)
--slotIdentifies a slot. (Not used means all Slots)
```

The command executed must ask for user confirmation before running.

In this command the user does not select a firmware file. The file is chosen automatically for each ONU based on the software version and hardware versions defined.

About the sw-version parameter:

- **OFF** – this ONU does not have a software version specified. See the **/applications/firmware-upgrade** node for more information.
- **AUTO** – this ONU has the software version set to automatically. This ONU will receive software updates from the default file for the configured profile. See the **/applications/firmware- upgrade** node for more information.
- **text** – Insert a valid sw-version or create a new one. This ONU will only receive updates executed as **"planned"** from the files that have a matching sw-version.

"manager" sub-node

This sub-node can be used to update the firmware of several ONTs in one operation (in /applications/firmware-upgrade/onu-upgrade node).

The /applications/firmware-upgrade/files node is used to manage the local firmware repository.

"config" command

Table 199. "config" command information

Name	config
Description	Configures management information
Full path	/applications/manager/config
Mandatory Parameters	--ID
Screen Output	No

Figure 281. CLI on line help on "config" command usage in this node context

```
/cli/applications> manager/config ?

Usage:
  CONFIG        Configure management information

  <MANDATORY>
```

--ID Identifies a table entry by ID, in this context.

[OPTIONAL]

--admin Administrative State. Enable/disable, in this context. (enable|disable)

--buffer-size Specify the trap buffer size in bytes (informs only).

--interval Wait the specified period of seconds before re-sending the trap when no ACK is received (informs only).

--ip-address IPv4 address

--ip-port Identifies the IP port number to use. (1..65535)

--permissions Allow this manager to READ or READ/CONFIGURE on this equipment (ro|rw)

--retries Number of retries before skipping the current trap (informs only).

--trap-mode Specify the trap mode

"show" command

Table 200. "show" command information

Name	show
Description	Shows the current management configuration
Full path	/applications/manager/show
Mandatory Parameters	This command has no parameters
Screen Output	Table, Figure 283; table parameters description in Table 201

Figure 282. CLI on line help on "show" command usage in this node context

/cli/applications> manager/show ?

Usage:

SHOW Show the current management configuration

Figure 283. Output of "show" command in this node context

```
/cli/applications/manager> show
+-----------------------------------------------------------------------------------------------------------------+
|Manager Configuration                                                                                            |
+---+---------------+---------+----------+-------------+-----------+-------------------+--------------+---------+
|ID |Manager IP     |Admin    |Trap Mode |Permissions  |Send Port  |Buffer size (bytes)|Interval (s)  |Retries  |
+---+---------------+---------+----------+-------------+-----------+-------------------+--------------+---------+
|1  |0.0.0.0        |disable  |none      |read-write   |162        | --                | --           | --      |
|2  |0.0.0.0        |disable  |none      |read-write   |162        | --                | --           | --      |
|3  |0.0.0.0        |disable  |none      |read-write   |162        | --                | --           | --      |
+---+---------------+---------+----------+-------------+-----------+-------------------+--------------+---------+
/cli/applications/manager>
```

Table 201. "show" command output table parameters

Parameter	Description
ID	Manager ID
Manager IP	Manager IPv4 address
Admin	Administrative State.
Trap Mode	Used Trap mode for the OLT to communicate with Network Management System. (none|Trap/Ack|Trap V2| Inform)
Permissions	Manager permissions in the equipment (READ|READ/CONFIGURE
Send Port	Used IP port number to send traps
Buffer size(bytes)	trap buffer size
Interval (s)	Waiting period of time before re-sending the trap when no ACK is received
Retries	Number of retries before skipping the current trap

"olt-upgrade" sub-node

"apply-file" command

Table 202. "apply-file" command information

Name	apply-file
Description	Updates OLT-OS with the last imported setup file. The system will reboot to use the new image.
Full path	/applications/olt-upgrade/apply-file
Mandatory Parameters	This command has no parameters
Screen Output	No

Figure 284. CLI on line help on "apply-file" command usage in this node context

```
/cli/applications> olt-upgrade/apply-file ?

Usage:
  APPLY-FILE      Update OLT-OS with the last imported setup file. The system will
reboot to use the new image.
```

"import" command

Table 203. "import" command information

Name	import
Description	Imports a new OLT-OS setup file from a TFTP server.
Full path	/applications/olt-upgrade/import
Mandatory Parameters	--file-name --ip-address
Screen Output	No

Figure 285. CLI on line help on "import" command usage in this node context

```
/cli/applications> olt-upgrade/import ?

Usage:
 IMPORT        Import a new OLT-OS setup file from a TFTP server.

  <MANDATORY>
  --file-name     Specify the file name, in this context.
  --ip-address    IPv4 address

  [OPTIONAL]
  --ip-port  Identifies the IP port number to use. (1..65535)
```

"time" sub-node

This sub-node can be used to update the firmware of several ONTs in one operation (in **/applications/firmware-upgrade/onu-upgrade** node).

The **/applications/firmware-upgrade/files** node is used to manage the local firmware repository.

"ntp" sub-node

This sub-node allows the configuration of the NTP servers.

"config" command

Table 204. "config" command information

Name	config
Description	Configures an existing NTP server..
Full path	/applications/time/ntp/config
Mandatory Parameters	--ID
Screen Output	No

Figure 286. CLI on line help on "config" command usage in this node context

```
/cli/applications> time/ntp/config ?

Usage:
 CONFIG        Configure
```

```
<MANDATORY>
--ID                    Identifies a table entry by ID, in this context.

[OPTIONAL]
--admin   Administrative State. Enable/disable, in this context. (enable|disable)
--ip-address   IPv4 address
--name    Insert a name STRING.
```

"create" command

Table 205. "config" command information

Name	create
Description	Creates a new NTP server entry
Full path	/applications/time/ntp/create
Mandatory Parameters	--ip-address --name
Screen Output	No

Figure 287. CLI on line help on "create" command usage in this node context

```
/cli/applications> time/ntp/create ?

Usage:
 CREATE        Create

 <MANDATORY>
 --ip-address   IPv4 address
 --name    Insert a name STRING.

 [OPTIONAL]
 --admin   Administrative State. Enable/disable, in this context. (enable|disable)
```

"disable" command

Table 206. "disable" command information

Name	disable
Description	Disable global NTP time configuration.
Full path	/applications/time/ntp/disable
Mandatory	This command has no parameters

Parameters	
Screen Output	No

Figure 288. CLI on line help on "disable" command usage in this node context

```
/cli/applications> time/ntp/disable ?

Usage:
  DISABLE        Disable global NTP time configuration.
```

"enable" command

Table 207. disable" command information

Name	enable
Description	Enables global NTP time configuration.
Full path	/applications/time/ntp/enable
Mandatory Parameters	This command has no parameters
Screen Output	No

Figure 289. CLI on line help on "enable" command usage in this node context

```
/cli/applications> time/ntp/enable ?

Usage:
  ENABLE         Enable global NTP time configuration.
```

"remove" command

Table 208. "remove" command information

Name	enable
Description	Removes a configured NTP server.
Full path	/applications/time/ntp/remove
Mandatory Parameters	--ID
Screen Output	No

Figure 290. CLI on line help on "remove" command usage in this node context

```
/cli/applications> time/ntp/remove ?
```

```
Usage:
 REMOVE        Remove

 <MANDATORY>
 --ID  Identifies a table entry by ID, in this context.
```

"show" command

Table 209. "show" command information

Name	show
Description	Shows the current configuration
Full path	/applications/time/ntp/show
Mandatory Parameters	This command has no parameters
Screen Output	Table, Figure 292; table parameters description in Table 210

Figure 291. CLI on line help on "show" command usage in this node context

```
/cli/applications> time/ntp/show ?

Usage:
 SHOW          Show the current configuration
```

Figure 292. Output of "show" command in this node context

```
/cli/applications/time/ntp> show
+----------------------------------------+
|Global NTP State                        |
+----------------------------------------+
|Disabled                                |
+----------------------------------------+

+-------------------------------------------+
|Configured NTP Servers                     |
+---+-------+---------------+---------------+
|ID |Admin  |Name           |IP             |
+---+-------+---------------+---------------+
+---+-------+---------------+---------------+
/cli/applications/time/ntp>
```

Table 210. "show" command output table parameters

Parameter	Description
Global NTP state	Current Global NTP server state (enabled|disabled)
ID	Current NTP server ID
Admin	Current administrative state

Name	Current NTP server name
IP	Current NTP server IP address (IPv4 address)

"showconfig" command

Table 211. "showconfig" command information

Name	showconfig
Description	Prints the command list that enforces the current configuration
Full path	/applications/time/ntp/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 293. CLI on line help on "showconfig" command usage in this node context

```
/cli/applications> time/ntp/showconfig ?

Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

"time-zone" sub-node

This sub-node allows the configuration of the system time and the time zones.

"availableValues" command

Table 212. "availableValues" command information

Name	availableValues
Description	Displays all supported Time Zones and respective IDs.
Full path	/applications/time/time-zone/availableValues
Mandatory Parameters	This command has no parameters
Screen Output	Table, Figure 295 . Table parameters described in Table 213

Figure 294. CLI on line help on "availableValues" command usage in this node context

```
/cli/applications> time/time-zone/availableValues ?

Usage:
  AVAILABLEVALUES Display all supported Time Zones and respective IDs.
```

Figure 295. Partial output of ”availableValues” command in this node context

```
+-------------------------------------------------------------------------------------------------------------------------------+
|Time Zones Available Values                                                                                                    |
+-----+-----------------------------------------------------------+-------------------------------------------------------------+
|ID   |Time-Zone Name                                             |Time-Zone Description                                        |
+-----+-----------------------------------------------------------+-------------------------------------------------------------+
|412  |America/Denver                                             |Mountain Time                                                |
|413  |America/Boise                                              |Mountain Time - south Idaho & east Oregon                    |
|414  |America/Shiprock                                           |Mountain Time - Navajo                                       |
|415  |America/Phoenix                                            |Mountain Standard Time - Arizona                             |
|416  |America/Los_Angeles                                        |Pacific Time                                                 |
|417  |America/Anchorage                                          |Alaska Time                                                  |
|418  |America/Juneau                                             |Alaska Time - Alaska panhandle                               |
|419  |America/Sitka                                              |Alaska Time - southeast Alaska panhandle                     |
|420  |America/Yakutat                                            |Alaska Time - Alaska panhandle neck                          |
|421  |America/Nome                                               |Alaska Time - west Alaska                                    |
|422  |America/Adak                                               |Aleutian Islands                                             |
|423  |America/Metlakatla                                         |Metlakatla Time - Annette Island                             |
|424  |Pacific/Honolulu                                           |Hawaii                                                       |
|425  |America/Montevideo                                         |                                                             |
|426  |Asia/Samarkand                                             |west Uzbekistan                                              |
|427  |Asia/Tashkent                                              |east Uzbekistan                                              |
|428  |Europe/Vatican                                             |                                                             |
|429  |America/St_Vincent                                         |                                                             |
|430  |America/Caracas                                            |                                                             |
|431  |America/Tortola                                            |                                                             |
|432  |America/St_Thomas                                          |                                                             |
|433  |Asia/Ho_Chi_Minh                                           |                                                             |
|434  |Pacific/Efate                                              |                                                             |
|435  |Pacific/Wallis                                             |                                                             |
|436  |Pacific/Apia                                               |                                                             |
|437  |Asia/Aden                                                  |                                                             |
|438  |Indian/Mayotte                                             |                                                             |
|439  |Africa/Johannesburg                                        |                                                             |
|440  |Africa/Lusaka                                              |                                                             |
|441  |Africa/Harare                                              |                                                             |
|--   |UTC                                                        |                                                             |
+-----+-----------------------------------------------------------+-------------------------------------------------------------+
/cli/applications/time/time-zone>
```

Table 213. “availablleValues” command output table parameters

Parameter	Description
ID	Time Zone identifier (number)
Time-Zone Name	Time Zone identifier (name)
Time-Zone description	Indicates region to which the indicated time zone is applicable

“config” command

Table 214. "config" command information

Name	config
Description	Configures time-zone information.
Full path	/applications/time/time-zone/config
Mandatory Parameters	No
Screen Output	No

Figure 296. CLI on line help on “config” command usage in this node context

```
/cli/applications> time/time-zone/config ?

Usage:
  CONFIG        Configure time-zone information.
```

```
[OPTIONAL]
--central-manager-time-zone     Select the time zone of the central manager. (string or
      ID from table 'availableValues')
--local-time-zone          Select the time zone of the current equipment. (string          or
ID from table 'availableValues')
```

"show" command

Table 215. "show" command information

Name	show
Description	Displays the current time zone configuration.
Full path	/applications/time/time-zone/show
Mandatory Parameters	This command has no parameters
Screen Output	Table, Figure 298, table parameters described in Table 216

Figure 297. CLI on line help on "show" command usage in this node context

```
/cli/applications> time/time-zone/show ?


Usage:
 SHOW          Display the current time zone configuration.
```

Figure 298. Output of "show" command in this node context

```
/cli/applications/time/time-zone> show
+-------------------------------------------------------------------------------------------------------+
|Time Zones                                                                                             |
+------------------------------+------------------------------------------------------------------------+
|Reference                     |Time Zone                                                               |
+------------------------------+------------------------------------------------------------------------+
|Local                         |UTC                                                                     |
|Network Management Platform   |UTC                                                                     |
+------------------------------+------------------------------------------------------------------------+
/cli/applications/time/time-zone>
```

Table 216. "show" command output table parameters

Parameter	Description
Reference	Indicates the currently used reference used either by the equipment (Local) and the Network Management Platform
Time Zone	Indicates the currently used Time Zone

"showconfig" command

Table 217. "showconfig" command information

Name	showconfig

Description	Prints the command list that enforces the current configuration.
Full path	/applications/time/time-zone/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 299. CLI on line help on "showconfig" command usage in this node context

```
/cli/applications> time/time-zone/showconfig ?

Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

"backup-manager" node

"create" command

Table 218. "create" command information

Name	create
Description	Creates a new backup file from the current system state.
Full path	/backup-manager/create
Mandatory Parameters	No
Screen Output	No

Figure 300. CLI on line help on "create" command usage in this node context

```
/cli/backup-manager> create ?

Usage:
  CREATE          Creates a new backup file from the current system state.

  [OPTIONAL]
  --description               Set a description, in this context.
```

“del-serv-conf” command

Table 219. " del-serv-conf " command information

Name	del-serv-conf
Description	Delete the Service configuration. Resets to factory settings.
Full path	/backup-manager/del-serv-conf
Mandatory Parameters	This command has no parameters
Screen output	No

Figure 301. CLI on line help on “del-serv-conf” command usage in this node context

```
/cli/backup-manager> del-serv-conf ?

Usage:
  DEL-SERV-CONF   Delete the Service configuration. Resets to factory settings.
```

“export” command

Table 220. " export " command information

Name	export
Description	Send an existing backup file to a TFTP server.
Full path	/backup-manager/export
Mandatory Parameters	--local-file --remote-file --server-ip
Screen output	No

Figure 302. CLI on line help on “export” command usage in this node context

```
/cli/backup-manager> export ?

Usage:
  EXPORT        Send an existing backup file to a TFTP server.

   <MANDATORY>
   --local-file     A file name on the local repository
   --remote-file    The Path/to/file on the TFTP server
   --server-ip      The TFTP server IP address
```

```
[OPTIONAL]
--server-port   The TFTP server port number
```

“import” command

Table 221. "import " command information

Name	import
Description	Get a previously exported backup file from a TFTP server.
Full path	/backup-manager/import
Mandatory Parameters	--local-file --remote-file --server-ip
Screen output	No

Figure 303. CLI on line help on “import” command usage in this node context

```
/cli/backup-manager> import ?

Usage:
 IMPORT        Get a previously exported backup file from a TFTP server.

  <MANDATORY>
  --local-file     A file name on the local repository
  --remote-file   The Path/to/file on the TFTP server
  --server-ip      The TFTP server IP address

  [OPTIONAL]
  --server-port   The TFTP server port number
```

“remove” command

Table 222. "remove " command information

Name	remove
Description	Deletes an existing backup file.
Full path	/backup-manager/remove
Mandatory Parameters	--file-name

Screen output	No

Figure 304. CLI on line help on "remove" command usage in this node context

```
/cli/backup-manager> remove ?

Usage:
 REMOVE        Deletes an existing backup file.

  <MANDATORY>
  --file-name                Specify the file name, in this context.
```

"restore" command

Table 223. "restore" command information

Name	restore
Description	Apply a backup file to the current system. The equipment will reboot.
Full path	/backup-manager/ restore
Mandatory Parameters	--file-name
Screen output	No

Figure 305. CLI on line help on "restore" command usage in this node context

```
/cli/backup-manager> restore ?

Usage:
 RESTORE        Apply a backup file to the current system. The equipment will reboot.

  <MANDATORY>
  --file-name     Specify the file name, in this context.
```

"show" command

Table 224. "show" command information

Name	show
Description	Display a table with all existing backup files.
Full path	/backup-manager/show

Mandatory Parameters	This command has no parameters
Screen output	Table, Figure 307; table parameter description in Table 225

Figure 306. CLI on line help on "show" command usage in this node context

```
/cli/backup-manager> show ?

Usage:
  SHOW          Display a table with all existing backup files.
```

Figure 307. Output of "show" command in this node context

```
/cli/backup-manager> show
+-------------------------------------------------------------------------------------------------------------------------------------------------------+
|Backups List                                                                                                                                           |
+-------------------------------------------------------------------------------------------------------------------------------------------------------+
|Name                                                  |Date       |Time     |Description                                                                   |
+-------------------------------------------------------------------------------------------------------------------------------------------------------+
|file20141110_141852_10_112_105_25.db                  |2014/11/10 |14:18:52 |AGG_PON_3                                                                     |
+-------------------------------------------------------------------------------------------------------------------------------------------------------+
/cli/backup-manager>
```

Table 225. "show" command output table parameters

Parameter	Description
Name	Backup filename
Date	Date of backup file creation
Time	Time of backup file creation
Description	Backup file short description

"cfm-probe" node

Figure 308. "cfm-node" tree

```
/cli/cfm-probe> tree
+ cfm-probe[@config, @create, @remove, @show, @showconfig, @status]
  + unx-ccm[@remove, @show]
```

"config" command

Table 226. "config" command information

Name	config
Description	Configure a specific CFM probe.
Full path	/cfm-probe/config
Mandatory Parameters	--ID --slot

Screen Output	No

Figure 309. CLI on line help on "config" command usage in this node context

```
/cli/cfm-probe> config ?

Usage:
 CONFIG        Configure a specific CFM probe.

  <MANDATORY>
  --ID  Identifies a table entry by ID, in this context.
  --slotIdentifies a slot.

  [OPTIONAL]
  --admin   Administrative State. Enable/disable, in this context. (enable|disable)
  --icc-umcSpecify the concatenated ICC and UMC fields of the MEG ID      according to
ITU-T Y.1731
  --level     Specify level (only 7 allowed)
  --md-format   Specify the MD Name Format (no-md|dns-based|mac+integer|string)
  --md-name     Specify the Maintenance Domain (MD) Name according to IEEE 802.1ag
  --mep     Specify MEP Id
  --rmep    Specify RMEP Id
  --sma-format  Specify the Short MA Name Format (primary-   vid|string|integer|rfc2685-
vpn-id)
  --sma-name    Specify the short MA Name according to IEEE 802.1ag
  --transmission-period   Specify the transmission period (10ms|100ms|1s|10s|1min|10min)
  --vlan      Choose a VLAN ID.
```

"create" command

Table 227. "create" command information

Name	create
Description	Create a new CFM probe.
Full path	/cfm-probe/create
Mandatory Parameters	--mep --port --slot
Screen output	No

Figure 310. CLI on line help on "create" command usage in this node context

```
/cli/cfm-probe> create ?

Usage:
 CREATE        Create a new CFM probe.

  <MANDATORY>
  --mep       Specify MEP Id
  --port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot.

  [OPTIONAL]
  --admin   Administrative State. Enable/disable, in this context. (enable|disable)
  --icc-umcSpecify the concatenated ICC and UMC fields of the MEG ID       according to
ITU-T Y.1731
  --level     Specify level (only 7 allowed)
  --md-format   Specify the MD Name Format (no-md|dns-based|mac+integer|string)
  --md-name     Specify the Maintenance Domain (MD) Name according to IEEE  802.1ag
  --rmep     Specify RMEP Id
  --sma-format  Specify the Short MA Name Format (primary-    vid|string|integer|rfc2685-
vpn-id)
  --sma-name    Specify the short MA Name according to IEEE 802.1ag
  --transmission-period   Specify the transmission period (10ms|100ms|1s|10s|1min|10min)
  --vlan       Choose a VLAN ID.
```

"remove" command

Table 228. "remove " command information

Name	remove
Description	Remove an existing CFM probe.
Full path	/cfm-probe/ remove
Mandatory Parameters	--ID --slot
Screen output	No

Figure 311. CLI on line help on “remove” command usage in this node context

```
/cli/cfm-probe> remove ?

Usage:
 REMOVE         Remove an existing CFM probe.

  <MANDATORY>
  --ID  Identifies a table entry by ID, in this context.
  --slotIdentifies a slot.
```

“show” command

Table 229. "show" command information

Name	show
Description	Show the current CFM probe configuration
Full path	/cfm-probe/show
Mandatory Parameters	No
Screen output	Table,Figure 313; table parameter description in Table 230

Figure 312. CLI on line help on “show” command usage in this node context

```
/cli/cfm-probe> show ?

Usage:
 SHOW           Show the current CFM probe configuration

  [OPTIONAL]
  --ID  Identifies a table entry by ID, in this context.
  --slotIdentifies a slot. (not used for LAG)
```

Figure 313. Output of ”show” command in this node context

```
/cli/cfm-probe> show
+-------------------------------------------------------------------------------------------------------------------------------------------------+
|CFM Probes                                                                                                                                       |
+----+---+---------+-------+------+------+-----+------------------+-----------------------------------------------------------------------+-----+
|Slot|ID |Admin    |Port   |MEP   |RMEP  |Level|Transmission Period|MEG ID / MAID                                                          |VLAN |
+----+---+---------+-------+------+------+-----+------------------+-----------------------------------------------------------------------+-----+
+----+---+---------+-------+------+------+-----+------------------+-----------------------------------------------------------------------+-----+
/cli/cfm-probe>
```

Table 230. "show" command output table parameters

Parameter	Description
Slot	Slot to which the monitored Physical interface belongs to
ID	CFM-probe ID
Admin	CFM probe administrative state
Port	Physical interface that the probe is monitoring
MEP	MEP Identification forwarded by the probe in the CCM message
RMEP	MEP ID of the remote MEP with which this probe makes P2P
Level	Probe OAM level, from 0-7 **Operator** (0, 1, 2) **Provider** (3, 4) **Customer** (5, 6, 7)
Transmission Period	Forwarding period of the CCM frames
MEG ID/MAID	Identification of the CFM maintenance group
VLAN	VLAN that encapsulates the CCM frame sent by the probe

"showconfig" command

Table 231. "showconfig" command information

Name	showconfig
Description	Prints the command list that enforces the current configuration.
Full path	/cfm-probe/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 314. CLI on line help on "showconfig" command usage in this node context

```
/cli/cfm-probe> showconfig ?

Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

"status" command

Table 232. "status" command information

Name	status
Description	Prints the command list that enforces the current configuration.
Full path	/cfm-probe/status
Mandatory Parameters	No

Screen Output	Table, Figure 316. Table parameters description in Table 233.

Figure 315. CLI on line help on "status" command usage in this node context

```
/cli/cfm-probe> status ?

Usage:
 STATUS        Show the current CFM probes status

  [OPTIONAL]
  --slot                  Identifies a slot. (not used for LAG)
```

Figure 316. Output of "status" command in this node context

```
/cli/cfm-probe> status
+-----------------------------------------------------------------------------------------+
|CFM Probe Status                                                                         |
+----+---+----------+-------+------+------+-------+------------+-------------------------+
|Slot|ID |Admin     |Port   |MEP   |RMEP  |VLAN   |Last CCM(ms)|Alarms                   |
+----+---+----------+-------+------+------+-------+------------+-------------------------+
+----+---+----------+-------+------+------+-------+------------+-------------------------+
/cli/cfm-probe>
```

Table 233. "status" command output table parameters

Parameter	Description
Slot	Slot to which the monitored Physical interface belongs to
ID	CFM-probe ID
Admin	CFM probe administrative state
Port	Physical interface that the probe is monitoring
MEP	MEP Identification forwarded by the probe in the CCM message
RMEP	MEP ID of the remote MEP with which this probe makes P2P
VLAN	VLAN that encapsulates the CCM frame sent by the probe
Last CCM (ms)	Instant of time of arrival of last received CCM packet
Alarms	This alarms triggers when no packets are transmitted/received

"unx-ccm" sub-node

"remove" command

Table 234. "remove" command information

Name	remove
Description	Clears the list of Unexpected CCMs received.
Full path	/cfm-probe/unx-ccm/remove

Mandatory Parameters	--slot
Screen Output	No

Figure 317. CLI on line help on “remove” command usage in this node context

```
/cli/cfm-probe/unx-ccm> remove ?

Usage:
 REMOVE        Clears the list of Unexpected CCMs received

  <MANDATORY>
  --slot       Identifies a slot.
```

“show” command

Table 235. "show" command information

Name	show
Description	Shows a list of Unexpected CCMs received.
Full path	/cfm-probe//unx-ccm/show
Mandatory Parameters	No
Screen Output	Table, Figure 319. Table parameters description in Table 236.

Figure 318. CLI on line help on “show” command usage in this node context

```
/cli/cfm-probe/ unx-ccm>show ?

Usage:
 SHOW          Shows a list of Unexpected CCMs received

  [OPTIONAL]
  --slotIdentifies a slot. (not used for LAG)
```

Figure 319. Output of ”show” command in this node context

```
/cli/cfm-probe/unx-ccm> show
+-----------------------------------------------------------------------------------------------------------------------+
|Unexpected CCMs Received                                                                                               |
+----+---+-------+------+------+----------+--------------+-------+--------------------+--------------------+--------+
|Slot|ID |Port   |MEP   |RMEP  |MEG-Format|MEG ICC/UMC   |VLAN   |Fist occur.         |Last occur.         |# occur.|
+----+---+-------+------+------+----------+--------------+-------+--------------------+--------------------+--------+
+----+---+-------+------+------+----------+--------------+-------+--------------------+--------------------+--------+
/cli/cfm-probe/unx-ccm>
```

Table 236. "show" command output table parameters

Parameter	Description
Slot	Slot to which the monitored Physical interface belongs to
ID	CFM-probe ID
Admin	CFM probe administrative state
Port	Physical interface that the probe is monitoring
MEP	MEP Identification forwarded by the probe in the CCM message
RMEP	MEP ID of the remote MEP with which this probe makes P2P
MEG-Format	ITU-T Y.1731 or IEEE 802.1ag
MEG ICC/UMC	ITU Carrier Code or Unique MEG Code
VLAN	VLAN that encapsulates the CCM frame sent by the probe
Fist occur.	Date of first Unexpected CCM Packet type occurrence
Last occur.	Date of last Unexpected CCM Packet type occurrence
# occur.	Number of Unexpected CCM Packet type occurrences

"dhcp" node

Circuit ID template String Syntax

The Syntax for the circuit ID template string is the following:

$accessnodeid PON $rack/$subrack/$slot/$port:$onuid.$svid

Template circuit ID parameters, variables and usable values are listed in the following table:

Table 237. Template circuit ID syntax

Parameter	Variable	Value
Access Node	$accessnodeid	String(63)
Rack	$rack	0..99
Sub-Rack	$subrack	0..99
Shelf	$shelf	0..99
Ethernet Priority	$ethprty	0..7
Shelf	$shelf	0..99
Ethernet Priority	$ethprty	0..7
ONU ID	$onuid	0..999
Slot	$slot	0..99
Port	$port	0..99
Q-VLAN ID	$qvid	0..4095
S-VLAN ID	$svid	0..4095
C-VLAN ID	$cvid	0..4095

Figure 320. "dhcp" tree

```
/cli/dhcp> tree
+ dhcp[]
  + dhcp-services[@config, @show]
  + global[@config, @show, @showconfig]
  + leases[@show]
```

"dhcp-services" sub-node

"config" command

Table 238. "config" command information

Name	config
Description	Configure DHCP parameters for a given service.
Full path	/dhcp/dhcp-services/config
Mandatory Parameters	--serviceID
Screen Output	No

Figure 321. CLI on line help on "config" command usage in this node context

```
/cli/dhcp/dhcp-services> config ?

Usage:
 CONFIG        Configure DHCP parameters for a given service.

  <MANDATORY>
  --serviceID                Select an OLT service by ID.

  [OPTIONAL]
  --circuit-id-strtemplate string for circuit-id
  --dhcp-op18   Enable or disable the DHCP Op.18 (enable|disable)
  --dhcp-op37   Enable or disable the DHCP Op.37 (enable|disable)
  --dhcp-op82   Enable or disable the DHCP Op.82 (enable|disable)
  --eth-priority  pbit value in the DHCP packets (0<=n<=7)
  --use-global   If enabled, this service will use the global circuit-id string (enable|disable)
```

“show” command

Table 239. "show" command information

Name	show
Description	Show DHCP services information..
Full path	/dhcp/dhcp-services/show
Mandatory Parameters	--serviceID
Screen Output	Table, Figure 323.Table parameter description in Table 240.

Figure 322. CLI on line help on “show” command usage in this node context

```
/cli/dhcp/dhcp-services> show ?


Usage:
  SHOW          Show DHCP services information.
```

Figure 323. Output of ”show” command in this node context

```
/cli/dhcp/dhcp-services> show
+-----------------------------------------------------------------------------------------------------------------------------------------------------------------+
|DHCP Services Configuration                                                                                                                                      |
+-----------------------------------------------------------------+-------+-----------------------------------------------------------------------------------------+
|                                                                 |DHCP Opt|Circuit-ID                                                                              |
+---+---------------------------------+--------+--------------+--+--+--+----------+-----------------------------------------------------------------------------------------+
|ID |Service Name                     |Priority|Broadcast flag|82|37|18|Use Global|Service Template String                                                                  |
+---+---------------------------------+--------+--------------+--+--+--+----------+-----------------------------------------------------------------------------------------+
+---+---------------------------------+--------+--------------+--+--+--+----------+-----------------------------------------------------------------------------------------+
/cli/dhcp/dhcp-services>
```

Table 240. “show” command output table parameters

Parameter	Description
ID	OLT service ID
Service Name	OLT service Name.
DHCP Opt	DHCP Options:18/37/82 – Enabled DHCP options in the service
Eth. Priority	pbit value in the DHCP packets (0<=n<=7)
Circuit Id	**Use Global:** if Enabled the Circuit-Id configure in the Global DHCP configuration window is being used. **Service Template String :** Circuit-Id template used for the service if Use Global Disabled.

“showconfig” command

Table 241. "showconfig" command information

Name	showconfig
Description	Prints the command list that enforces the current configuration.

Full path	/dhcp/dhcp-services/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 324. CLI on line help on "showconfig" command usage in this node context

```
/cli/dhcp/dhcp-services> showconfig ?

Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

"global" sub-node

"config" command

Table 242. "config" command information

Name	config
Description	Configure global DHCP parameters.
Full path	/dhcp/global/config
Mandatory Parameters	--circuit-id-str
Screen Output	No

Figure 325. CLI on line help on "config" command usage in this node context

```
//cli/dhcp/global> config ?

Usage:
  CONFIG          Configure global DHCP parameters.

   <MANDATORY>
   --circuit-id-str[=STRING]    template string for circuit-id
```

"show" command

Table 243. "show" command information

Name	show
Description	Show DHCP global configuration.

Full path	/dhcp/global/show
Mandatory Parameters	This command has no parameters
Screen Output	Text string, Figure 327.Template string parameter description in Table 237.

Figure 326. CLI on line help on "show" command usage in this node context

```
/cli/dhcp/global> show ?

Usage:
  SHOW          Show DHCP global configuration.
```

Figure 327. Output of "show" command in this node context

```
/cli/dhcp/global> show
Global DHCP circuit ID Template String:
"$accessnodeid PON $rack/$subrack/$slot/$port:$onuid.$svid"
```

"showconfig" command

Table 244. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/dhcp/global/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 328. CLI on line help on "showconfig" command usage in this node context

```
/cli/dhcp/global> showconfig ?

Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

"leases" sub-node

"show" command

Table 245. "show" command information

Name	show
Description	Show DHCP leases information.
Full path	/dhcp/leases/show
Mandatory Parameters	No
Screen Output	Table Figure 330.Table parameter description in Table 246.

Figure 329. CLI on line help on "show" command usage in this node context

```
/cli/dhcp/leases> show ?

Usage:
  SHOW          Show DHCP leases information.

  [OPTIONAL]
  --slot        Identifies a slot. (not used for LAG)
```

Figure 330. Output of "show" command in this node context

```
/cli> dhcp/leases/show
+-----------------------------------------------------------------------------------------------+
|DHCP Leases                                                                                    |
+----+-------+------+--------------------+------------------+----------------+----------+
|Slot|Port   |ONT ID|(ID)Service         |IP                |MAC             |Leave Time|
+----+-------+------+--------------------+------------------+----------------+----------+
|2   |Pon 16 |1     |(13)LDRA_Enable     |3000:0:0:801a::   |00:00:6A:19:01:02|00:55:12  |
|2   |Pon 16 |1     |(13)LDRA_Enable     |192.154.0.2       |00:00:6A:1E:01:02|00:59:55  |
+----+-------+------+--------------------+------------------+----------------+----------+
```

Table 246. "show" command output table parameters

Parameter	Description
Slot	Slot number
Port	Identifies interface
ONU ID	Identifies ONT (number)
(ID)	Service ID (number)
Service	Service name (text)
IP	IP address
MAC	MAC address
Leave Time	Use of Global circuit Id string (enabled|disabled)

“equipment” node

Figure 331. “equipment” node tree

```
/cli/equipment> tree
+ equipment[@status]
  + boards[@config, @show, @reboot, @showconfig]
  + slot[@apply, @config, @show, @showconfig]
  + switch-fabric[@show, @switch, @update, @upgrade-sw]
  + system[@config, @show, @showconfig]
```

“status” command

Table 247. "status" command information

Name	status
Description	Show the current equipment status.
Full path	/equipment/status
Mandatory Parameters	This command has no parameters
Screen Output	Table, Figure 333. Table parameters description inTable 248.

Figure 332. CLI on line help on “status” command usage in this node context

```
/cli/equipment> status ?

Usage:
  STATUS        Show the current equipment status.
```

Figure 333. Output of ”status” command in this node context

```
/cli/equipment> status
+----------------+
|Equipment Status|
+----------------+
|Status          |
+----------------+
|OK              |
+----------------+
/cli/equipment>
```

Table 248. “status” command output table parameters

Parameter	Description
Status	Indicates equipment status.

“boards” sub-node

“config” command

Table 249. "config" command information

Name	config
Description	Configure HW slots.
Full path	/equipment/boards/config
Mandatory Parameters	--admin --slot
Screen Output	No

Figure 334. CLI on line help on “config” command usage in this node context

```
/cli/equipment/boards> config ?

Usage:
  CONFIG        Configure HW slots

  <MANDATORY>
  --admin   Administrative State. Enable/disable, in this context. (enable|disable)
  --slotIdentifies a slot..
```

“reboot” command

Table 250. "reboot" command information

Name	reboot
Description	Send the reboot command to one board.
Full path	/equipment/boards/reboot
Mandatory Parameters	--slot
Screen Output	No

Figure 335. CLI on line help on “reboot” command usage in this node context

```
/cli/equipment/boards> reboot ?

Usage:
  REBOOT                Send the reboot command to one board.
```

<MANDATORY>	
--slot	Identifies a slot.

“show” command

Table 251. "show" command information

Name	show
Description	Show the current configuration.
Full path	/equipment/boards/show
Mandatory Parameters	This command has no parameters.
Screen Output	Tables Figure 337 and Figure 338.Tables parameter description in Table 252 and Table 253.

Figure 336. CLI on line help on “show” command usage in this node context

```
/cli/equipment/boards> show ?

Usage:
  SHOW          Show the current configuration
```

Figure 337. Output of ”show” command in this node context – table “Equipment Boards Information”

```
/cli/equipment/boards> show
+-------------------------------------------------------------------------------------------------------------------------------+
|Equipment Boards Information                                                                                                   |
+----+---------------+---------------+--------+---------------+--------+----------+------------+---------------+--------------------+
|Slot|Name           |State          |Admin   |Temperature (C)|CPU (%) |Memory (%)|Capacity (%)|Serial number  |FW / HW version     |
+----+---------------+---------------+--------+---------------+--------+----------+------------+---------------+--------------------+
|1   |XCO-160 (ACT)  |OK             |enable  |56.00          |8.69    |28.14     |22.45       |7864100098     |1.0.50 / PCB 2.14   |
|2   |AMX-48GE       |OK             |enable  |62.00          |35.59   |45.09     |86.95       |7614100429     |1.6.36 / PCB 4.5    |
|3   |AMX-48GE       |OK             |enable  |63.00          |35.51   |45.16     |88.51       |7614100443     |1.6.36 / PCB 4.5    |
|4   |AMX-48GE       |OK             |enable  |55.00          |36.36   |45.04     |87.02       |7614100439     |1.6.36 / PCB 4.5    |
|5   | --            |Empty          | --     | --            | --     | --       | --         | --            | --                 |
+----+---------------+---------------+--------+---------------+--------+----------+------------+---------------+--------------------+
```

Figure 338. Output of ”show” command in this node context – table “Equipment Fans Information”

```
+-----------------------------------------------------------------------------------------------+
|Equipment Fans Information                                                                     |
+-----+-----------------------------------------------------------------------------------------+
|     |RPM                                                                                      |
+-----+----------+----------+----------+----------+----------+----------+----------+----------+
|Slot |Fan 1     |Fan 2     |Fan 3     |Fan 4     |Fan 5     |Fan 6     |Fan 7     |Fan 8     |
+-----+----------+----------+----------+----------+----------+----------+----------+----------+
|6    |4440      |4620      |4440      |4620      |4500      |4560      |n/a       |n/a       |
+-----+----------+----------+----------+----------+----------+----------+----------+----------+
/cli/equipment/boards>
```

Table 252. “show” command output table parameters

Parameter	Description
Slot	Slot number
Name	Board Name
State	Slot State
Admin	Board administrative State
Temperature (ºC)	Board Temperature
CPU (%)	Board CPU usage
Memory (%)	Board Memory usage
Capacity (%)	Board capacity usage
Serial Number	Board serial number
FW / HW version	Board firmware and hardware version

Table 253. “show” command output parameters

Parameter	Description
Fan Nr	FAN current working speed (RPM)

“showconfig” command

Table 254. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/equipment/boards/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 339. CLI on line help on “showconfig” command usage in this node context

```
/cli/equipment/board> showconfig ?

Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

“slot” sub-node

“apply” command

Table 255. "apply" command information

Name	apply
Description	Applies the current configuration to the HW

Full path	/equipment/slot/apply
Mandatory Parameters	This command has no parameters
Screen Output	No

Figure 340. CLI on line help on "apply" command usage in this node context

```
/cli/equipment/slot> apply ?

Usage:
  APPLY         Applies the current configuration to the HW
```

"config" command

Table 256. "config" command information

Name	config
Description	Configure HW slots (not immediately applied)
Full path	/equipment/slot/config
Mandatory Parameters	--mode --slot
Screen Output	No

Figure 341. CLI on line help on "config" command usage in this node context

```
/cli/equipment/slot> config ?

Usage:
  CONFIG        Configure HW slots (not immediately applied)

  <MANDATORY>
  --mode    Specify the mode (disabled|modeA|modeB|modeC)
  --slotIdentifies a slot.
```

"show" command

Table 257. "show" command information

Name	show
Description	Show the current Slot-Mode configuration.
Full path	/equipment/slot/show
Mandatory	This command has no parameters.

Parameters	
Screen Output	Tables Figure 342.Tables parameter description Table 258

Figure 342. CLI on line help on “show” command usage in this node context

```
/cli/equipment/slot> show ?


Usage:
  SHOW          Show the current Slot-Mode configuration.
```

Figure 343. Output of ”show” command in this node context”

```
/cli/equipment/slot> show
+-------------------------------------------------------------------------------------------------------------------------------+
|Equipment Slot Information                                                                                                     |
+----+--------------------------------+---------------+-------+--------------+--------------+------------------------------+
|Slot|Card Name                       |Card Status    |Admin  |Config. Mode  |FW Mode       |FW Status                     |
+----+--------------------------------+---------------+-------+--------------+--------------+------------------------------+
|2   |AMX-48GE                        |OK             |enable |modeC         |modeC         |OK                            |
|3   |AMX-48GE                        |OK             |enable |modeC         |modeC         |OK                            |
|4   |AMX-48GE                        |OK             |enable |modeC         |modeC         |OK                            |
+----+--------------------------------+---------------+-------+--------------+--------------+------------------------------+
/cli/equipment/slot>
```

Table 258. “show” command output table parameters

Parameter	Description
Slot	Slot number
Card Name	Name of the card in the specified slot
Card Status	Card status (newboard|operational|configuration error|absent|proc.)
Admin	Board administrative State
Config. Mode	Configured mode on card (Mode A|Mode B)
FW Mode	Detected firmware mode on card (Mode A|Mode B)
FW Status	Card firmware Status (OK|disabled)

“showconfig” command

Table 259. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/equipment/slot/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 344. CLI on line help on “showconfig” command usage in this node context

```
/cli/equipment/slot> showconfig ?

Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

“switch-fabric” sub-node

“show” command

Table 260. "show" command information

Name	show
Description	Show the current Switch Fabric status.
Full path	/equipment/switch-fabric/show
Mandatory Parameters	This command has no parameters.
Screen Output	Tables Figure 346.Tables parameter description Table 261

Figure 345. CLI on line help on “show” command usage in this node context

```
/cli/equipment/switch-fabric> show ?

Usage:
  SHOW          Show the current Switch Fabric status.
```

Figure 346. Output of ”show” command in this node context”

```
/cli/equipment/switch-fabric> show
+-----------------------------------------------------------------------------------------------------------------------------------------+
|Switch Fabric Status                                                                                                                     |
+----+----------+----------+-----------------------------------------+-------------------------+-----------------------------+
|Slot|Status    |FW Status |Software                                 |Data                     |Commands                     |
+----+----------+----------+-----------------------------------------+-------------------------+-----------------------------+
|    |          |          |Version                        |Upgrade Status |Database  |Configurations |                             |
+----+----------+----------+-------------------------------+---------------+----------+---------------+-----------------------------+
|1   |active    |OK        | v3.4.1-r263                   | --            | --       | --            | -- / -- / --                |
+----+----------+----------+-------------------------------+---------------+----------+---------------+-----------------------------+
/cli/equipment/switch-fabric>
```

Table 261. “show” command output table parameters

Parameter	Description
Slot	Switch Fabric slot number
Status	Status of Switch Fabric board (activity and data state)
Available Commands	Commands that can be used per Switch Fabric board (dependent on the status)

“switch” command

Table 262. "switch" command information

Name	switch
Description	Set the other Switch Fabric (if any) to be active. Deactivate the current Switch Fabric
Full path	/equipment/switch-fabric/switch
Mandatory Parameters	This command has no parameters
Screen Output	No

Figure 347. CLI on line help on "switch" command usage in this node context

```
/cli/equipment/switch-fabric> switch ?

Usage:
  SWITCH        Set the other Switch Fabric (if any) to be active. Deactivate the current Switch Fabric.
```

"update" command

Table 263. "update" command information

Name	update
Description	Updates information on the active Switch Fabric, if not up to date.
Full path	/equipment/switch-fabric/update
Mandatory Parameters	This command has no parameters
Screen Output	No

Figure 348. CLI on line help on "update" command usage in this node context

```
/cli/equipment/switch-fabric> update ?

Usage:
  UPDATE        Updates information on the active Switch Fabric, if not up to date.
```

"upgrade-sw" command

Table 264. "upgrade-sw" command information

Name	Upgrade-sw
Description	Upgrade the inactive matrix software to the same version as the active matrix.

Full path	/equipment/switch-fabric/upgrade-sw
Mandatory Parameters	This command has no parameters
Screen Output	No

Figure 349. CLI on line help on "upgrade-sw" command usage in this node context

```
/cli/equipment/switch-fabric> upgrade-sw ?

Usage:
  UPGRADE-SW                    Upgrade the inactive matrix software to the same version as the
active matrix.
```

"system" sub-node

"config" command

Table 265. "config" command information

Name	config
Description	Global system configuration.
Full path	/equipment/system/config
Mandatory Parameters	No
Screen Output	No

Figure 350. CLI on line help on "config" command usage in this node context

```
/cli/equipment/system> config ?

Usage:
  CONFIG        Global system configuration.

  [OPTIONAL]
  --access-node      Access Node ID
  --alarm-rep-mode      Define the alarm reporting mode. (none|snmp|xml)
  --auto-update      Automatically upgrade the second Switch Fabric. (enable|disable)
  --contact      Set contact information as appropriate
  --date     Set the system date as YYYY/MM/DD (UTC)
  --description  Set a description, in this context.
```

```
--location      Set the system location as appropriate
--name  Insert a name STRING.
--numerical-rack system rack (numerical value)
--numerical-shelfsystem shelf (numerical value)
--numerical-sub-rack  system subrack (numerical value)
--rack    system rack
--shelf   system shelf
--sub-rack    system subrack
--time    Set the system time as hh:mm:ss (UTC)
```

“reboot” command

Table 266. "reboot" command information

Name	reboot
Description	Send the reboot command to the equipment.
Full path	/equipment/system/reboot
Mandatory Parameters	This command has no parameters
Screen Output	No

Figure 351. CLI on line help on “reboot” command usage in this node context

```
/cli/equipment/system> reboot ?

Usage:
  REBOOT                    Send the reboot command to the equipment.
```

“show” command

Table 267. "show" command information

Name	show
Description	Show the current global system configuration.
Full path	/equipment/system/show
Mandatory Parameters	This command has no parameters.
Screen Output	Tables Figure 342.Tables parameter description Table 258

Figure 352. CLI on line help on “show” command usage in this node context

```
/cli/equipment/system> show ?

Usage:
  SHOW          Show the current global system configuration.
```

Figure 353. Output of ”show” command in this node context”

```
/cli/equipment/system> show
+-----------------------------------------------------------------------------------------------------------+
|System Configuration                                                                                       |
+-----------------------------------------+-----------------------------------------------------------------+
|Properties                               |Values                                                           |
+-----------------------------------------+-----------------------------------------------------------------+
|Equipment Type                           |OLT1T1                                                           |
+-----------------------------------------+-----------------------------------------------------------------+
|Equipment Name                           |                                                                 |
|Description                              |                                                                 |
|Access Node ID                           |                                                                 |
|Serial Number                            |--                                                               |
|Rack                                     | 0 - 1                                                           |
|SubRack                                  | 0 - 1                                                           |
|Shelf                                    | 0 - 1                                                           |
|Contact                                  |                                                                 |
|Location                                 |                                                                 |
+-----------------------------------------+-----------------------------------------------------------------+
|Firmware version                         | v3.4.1-r263                                                     |
+-----------------------------------------+-----------------------------------------------------------------+
|Date On Equipment (UTC)                  |2000/03/04                                                       |
|Time On Equipment (UTC)                  |07:58:03                                                         |
+-----------------------------------------+-----------------------------------------------------------------+
|Equipment IP (for management)            |10.112.105.25                                                    |
|Administrative Status                    |Not registered                                                   |
|Alarms Reporting Mode                    |none                                                             |
+-----------------------------------------+-----------------------------------------------------------------+
|Automatically Upgrade the second Matrix |Disabled                                                         |
+-----------------------------------------+-----------------------------------------------------------------+
/cli/equipment/system>
```

Table 268. “show” command output table parameters

Parameter	Description
Equipment Type	Type/Model of the equipment
Equipment Name	Name of the equipment
Description	Equipment brief description
Access Node ID	Identification of the Access Node
Serial Number	Equipment serial number
Rack	Equipment location rack (number)
Sub Rack	Equipment location sub-rack (number)
Shelf	Equipment location shelf (number)
Contact	contact information of the entity responsible for this equipment (department, person, etc)
Location	Equipment location
Firmware version	Version of the current firmware
Date On Equipment	Date
Time On Equipment	Time
Equipment IP (for	Equipment IPv4 address

management)	
Manager IP	Manager IPv4 address
Administrative status	Equipment administrative status
Alarms Reporting Mode	(none|SNMP|XML)
Automatically Upgrade the second Matrix	(enabled|disabled)

"showconfig" command

Table 269. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/equipment/system/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 354. CLI on line help on "showconfig" command usage in this node context

```
/cli/equipment/system> showconfig ?


Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

"erp-ring" node

Figure 355. "erp-ring" node tree

```
/cli/erp-ring> tree
+ erp-ring[@config, @create, @remove, @show, @showconfig]
  + status[@command, @show]
    + aps-channel[@show]
```

"config" command

Table 270. "config" command information

Name	config
Description	Configure an existing ERP instance.

Full path	/erp-ring/config
Mandatory Parameters	--ID
Screen Output	No

Figure 356. CLI on line help on "config" command usage in this node context

```
/cli/erp-ring> config ?

Usage:
 CONFIG        Configure an existing ERP instance.

  <MANDATORY>
  --ID  Identifies a table entry by ID, in this context.

  [OPTIONAL]
  --add-vlan      Add one Protected vlan entry to the list (1..4094)
  --admin   Administrative State. Enable/disable, in this context. (enable|disable)
  --aps-ch-vlan  Set the APS channel VLAN (1..4094)
  --aps-meg-level     Set APS channel MEG level value (0..7)
  --del-vlan      Delete one Protected vlan entry from the list (1..4094)
  --guard-time   Set the guard time, in milliseconds (1..200)
  --holdoff-time      Set the hold off time, in milliseconds (0..100)
  --open-ring     Specify whether the ring is open or not. (enable|disable)
  --p0-cfm-probe-id Identify a CFM probe by ID
  --p0-port Identify a Port (e.g.: eth.1, pon.3, lag.2)
  --p0-slot  Identify a Slot (not used for LAG)
  --p0-type Set the port type (non-rpl|rpl|rpl-neighbor)
  --p1-cfm-probe-id Identify a CFM probe by ID
  --p1-port Identify a Port (e.g.: eth.1, pon.3, lag.2)
  --p1-slot  Identify a Slot (not used for LAG)
  --p1-type Set the port type (non-rpl|rpl|rpl-neighbor)
  --revertive      Specify is reversion is enabled. (enable|disable)
  --ring-id  Set the ring ID
```

“create” command

Table 271. "create" command information

Name	create
Description	Create a new Ethernet Ring Protection (ERP) instance..
Full path	/erp-ring/create
Mandatory Parameters	No
Screen Output	No

Figure 357. CLI on line help on “create” command usage in this node context

```
/cli/erp-ring> create ?

Usage:
 CREATE        Create a new Ethernet Ring Protection (ERP) instance.

  [OPTIONAL]
  --add-vlan      Add one Protected vlan entry to the list (1..4094)
  --admin   Administrative State. Enable/disable, in this context. (enable|disable)
  --aps-ch-vlan  Set the APS channel VLAN (1..4094)
  --aps-meg-level     Set APS channel MEG level value (0..7)
  --del-vlan      Delete one Protected vlan entry from the list (1..4094)
  --guard-time   Set the guard time, in milliseconds (1..200)
  --holdoff-time       Set the hold off time, in milliseconds (0..100)
  --open-ring     Specify whether the ring is open or not. (enable|disable)
  --p0-cfm-probe-id Identify a CFM probe by ID
  --p0-port Identify a Port (e.g.: eth.1, pon.3, lag.2)
  --p0-slot  Identify a Slot (not used for LAG)
  --p0-type Set the port type (non-rpl|rpl|rpl-neighbor)
  --p1-cfm-probe-id Identify a CFM probe by ID
  --p1-port Identify a Port (e.g.: eth.1, pon.3, lag.2)
  --p1-slot  Identify a Slot (not used for LAG)
  --p1-type Set the port type (non-rpl|rpl|rpl-neighbor)
  --revertive      Specify is reversion is enabled. (enable|disable)
  --ring-id  Set the ring ID
```

"remove" command

Table 272. "remove" command information

Name	remove
Description	Remove an existing ERP instance.
Full path	/erp-ring/remove
Mandatory Parameters	--ID
Screen Output	No

Figure 358. CLI on line help on "remove" command usage in this node context

```
/cli/erp-ring> remove ?

Usage:
 REMOVE        Remove an existing ERP instance.

  <MANDATORY>
  --ID                    Identifies a table entry by ID, in this context.
```

"show" command

Table 273. "show" command information

Name	show
Description	Show the summary configuration for all ERP instances. Specify an ID to see details.
Full path	/erp-ring/show
Mandatory Parameters	No
Screen Output	Tables Figure 342.Tables parameter description Table 258

Figure 359. CLI on line help on "show" command usage in this node context

```
/cli/erp-ring> show ?

Usage:
 SHOW          Show the summary configuration for all ERP instances. Specify an ID to see
details.
```

[OPTIONAL]

--ID Identifies a table entry by ID, in this context.

Figure 360. Output of "show" command in this node context"

```
/cli/erp-ring> show
+-------------------------------------------------------------------------------------------------------------------------+
|Ethernet Ring Protection Instances Summary                                                                               |
+-----------------------------------+---------+-----------------------------------------------------------------------+
|                                   |APS Channel    |                                                                 |
+---+-------+---------+---------+---------+-----+---------+--------------------+--------------------+-------------------+
|ID |Admin  |Ring ID  |Open Ring|Revertive|VLAN |MEG Level|Wait to restore (min) |Holdoff Time (x100ms) |Guard time (x100ms) |
+---+-------+---------+---------+---------+-----+---------+--------------------+--------------------+-------------------+
+---+-------+---------+---------+---------+-----+---------+--------------------+--------------------+-------------------+
/cli/erp-ring>
```

Table 274. "show" command output table parameters

Parameter	Description
ID	ERP instance Id
Admin	ERP administrative state
Ring ID	ERP Id
Open Ring	Open Ring Flag (enable/disable)
Revertive	Revertive flag (enable/disable)
APS Channel	**VLAN:** VLAN used by the Automatic Protection Switch Channel **MEG level:** Maintenance Entity Group OAM level, from 0-7 (Operator (0, 1, 2)/Provider (3, 4)/Customer (5, 6, 7))
Wait to restore (min)	1 to 12 min, default value -5min
Holdoff Time (x100ms)	1 to 10secs, default value- 0secs
Guard Time (x100ms)	10ms to 2secs, default value 500ms

"showconfig" command

Table 275. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/erp-ring/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 361. CLI on line help on "showconfig" command usage in this node context

```
/cli/erp-ring> showconfig ?
```

```
Usage:
 SHOWCONFIG     Print the command list that enforces the current configuration
```

“status” sub-node

“command” command

Table 276. "command" command information

Name	command
Description	Specify the command to execute on a given ERP instance port.
Full path	/erp-ring/status/command
Mandatory Parameters	--ID --erp-port --type
Screen Output	No

Figure 362. CLI on line help on “command” command usage in this node context

```
/cli/erp-ring/status> command ?

Usage:
 COMMAND        Specify the command to execute on a given ERP instance port.

  <MANDATORY>
  --ID  Identifies a table entry by ID, in this context.
  --erp-portChoose the ERP port to execute the command (p0|p1)
  --type      Identify the command to execute (clear|forced-switch|manual-switch)
```

“show” command

Table 277. "show" command information

Name	show
Description	Show the status information for all active ERP instances.
Full path	/erp-ring/status/show
Mandatory Parameters	This command has no parameters.
Screen Output	Table, Figure 364. Table parameters description in Table 278

Figure 363. CLI on line help on "show" command usage in this node context

```
/cli/erp-ring/status> show ?

Usage:
  SHOW          Show the status information for all active ERP instances.
```

Figure 364. Output of "show" command in this node context"

```
/cli/erp-ring/status> show
+-------------------------------------------------------------------------------------------------------------------+
|Active Ethernet Ring Protection Instances Status                                                                   |
+----------------------+-------------------------+-------------------------+-------------------------------------+
|                      |P0                       |P1                       |Timers (ms)                          |
+---+-------------+-----+-----------+-----+-----+-----------+-----+-----+-------+-------+-------+-------+
|ID |Node State   |DNF  |Slot / Port|Alarm|State|Slot / Port|Alarm|State|Guard  |WTR    |WTB    |Holdoff|
+---+-------------+-----+-----------+-----+-----+-----------+-----+-----+-------+-------+-------+-------+
+---+-------------+-----+-----------+-----+-----+-----------+-----+-----+-------+-------+-------+-------+
/cli/erp-ring/status>
```

Table 278. "show" command output table parameters

Parameter Group	Parameter	Description
	ID	ERP instance Id
	Node State	Identifies node state Protection/--
	DNF	Filtering Database Non Flush status bit
P0	Slot/Port	Identifies interface in the system by Slot/port pair
	Alarm	This alarm signals activity in the interface
	State	Interface state (Blocking/Flushing)
P1	Slot/Port	Identifies interface in the system by Slot/port pair
	Alarm	This alarm signals activity in the interface
	State	Interface state (Blocking/Flushing)
Timers (ms)	Guard	Shows configured guard timer value
	WTR	Shows configured Wait to Restore timer value
	WTB	Shows configured Wait to Block timer value
	Holdoff	Shows configured Holdoff timer value

"aps-channel" sub-node

"show" command

Table 279. "show" command information

Name	show
Description	Show APS channel information (RX/TX) for a given ERP instance.
Full path	/erp-ring/status/aps-channel/show
Mandatory Parameters	--ID
Screen Output	Yes

Figure 365. CLI on line help on “show” command usage in this node context

```
//cli/erp-ring/status/aps-channel> show ?

Usage:
 SHOW          Show APS channel information (RX/TX) for a given ERP instance.

  <MANDATORY>
  --ID  Identifies a table entry by ID, in this context.
```

“eth-protection” node

Figure 366. “eth-protection” node tree

```
/cli/eth-protection> tree
+ eth-protection[@command, @config, @create, @remove, @show, @showconfig, @status]
```

“command” command

Table 280. "command" command information

Name	command
Description	Execute a command on a given Protection entity.
Full path	/eth-protection/command
Mandatory Parameters	--ID --type
Screen Output	No

Figure 367. CLI on line help on “command” command usage in this node context

```
/cli/eth-protection> command ?

Usage:
 COMMAND                  Execute a command on a given Protection entity.

  <MANDATORY>
  --ID                    Identifies a table entry by ID, in this context.
  --type                  Identify the command to execute (clear|lockout|force-to-protection|force-to-working|manual-to-protection|manual-to-working)
```

“config” command

Table 281. "config" command information

Name	config
Description	Configure one Protection Group parameters.
Full path	/eth-protection/config
Mandatory Parameters	--ID
Screen Output	No

Figure 368. CLI on line help on “config” command usage in this node context

```
/cli/eth-protection> config ?

Usage:
  CONFIG                  Configure one Protection Group parameters.

  <MANDATORY>
  --ID                  Identifies a table entry by ID, in this context.

  [OPTIONAL]
  --admin                 Administrative State. Enable/disable, in this context. (enable|disable)
  --hold-off-time           Hold Off Time (0..100) x100ms
  --hp-lc-fail            high priority: Generalized Line Card Failure (enable|disable)
  --hp-los                high priority: Generalized LOS (enable|disable)
  --p-port                Identifies the Protecting Interface ID. (e.g.: pon.2)
  --p-slot                Identifies the Protecting Interface Slot.
  --reversible              Specify is reversion is enabled (enable|disable)
  --w-port                Identifies the Working Interface ID. (e.g.: pon.2)
  --w-slot                Identifies the Working Interface Slot.
  --wtr-time                Wait to Restore Time (WTR) (5..12) min
```

“create” command

Table 282. "create" command information

Name	create
Description	Create a new Protection Group.
Full path	/eth-protection/create

Mandatory Parameters	This command has no mandatory parameters
Screen Output	No

Figure 369. CLI on line help on "create" command usage in this node context

```
/cli/eth-protection> create ?

Usage:
  CREATE                  Create a new Protection Group.

  [OPTIONAL]
  --ID                  Identifies a table entry by ID, in this context.
  --admin                 Administrative State. Enable/disable, in this context. (enable|disable)
  --hold-off-time           Hold Off Time (0..100) x100ms
  --hp-lc-fail            high priority: Generalized Line Card Failure (enable|disable)
  --hp-los                high priority: Generalized LOS (enable|disable)
  --p-port                Identifies the Protecting Interface ID. (e.g.: pon.2)
  --p-slot                Identifies the Protecting Interface Slot.
  --reversible              Specify is reversion is enabled (enable|disable)
  --w-port                Identifies the Working Interface ID. (e.g.: pon.2)
  --w-slot                Identifies the Working Interface Slot.
  --wtr-time                Wait to Restore Time (WTR) (5..12) min
```

"remove" command

Table 283. "remove" command information

Name	remove
Description	Remove an existing Protection Group.
Full path	/eth-protection/remove
Mandatory Parameters	--ID
Screen Output	No

Figure 370. CLI on line help on "remove" command usage in this node context

```
/cli/eth-protection> remove ?

Usage:
```

```
REMOVE                  Remove an existing Protection Group.

<MANDATORY>
--ID                    Identifies a table entry by ID, in this context.
```

“show” command

Table 284. "show" command information

Name	show
Description	Show the current configuration.
Full path	/eth-protection/show
Mandatory Parameters	This command has no mandatory parameters
Screen Output	Tables Figure 372.Tables parameter description Table 285

Figure 371. CLI on line help on “show” command usage in this node context

```
/cli/eth-protection> show ?

Usage:
 SHOW                   Show the current configuration

 [OPTIONAL]
 --ID                   Identifies a table entry by ID, in this context.
```

Figure 372. Output of ”show” command in this node context”

```
/cli/eth-protection> show
+-------------------------------------------------------------------------------------------------------+
|Ethernet Protection Groups                                                                             |
+------------------+-----------------+--------------------+---------------------------------------+
|                  |Interface Working|Interface Protecting|                                       |
+---+-------+------+----+------------+----+---------------+----------+---------+-----------------+
|ID |Admin  |Mode  |Slot|Port        |Slot|Port           |Reversible|WTR (min)|Hold Off (x100ms)|
+---+-------+------+----+------------+----+---------------+----------+---------+-----------------+
+---+-------+------+----+------------+----+---------------+----------+---------+-----------------+
/cli/eth-protection>
```

Table 285. “show” command output table parameters

Parameter Group	Parameter	Description
	ID	Ethernet protection group Id
	Admin	Ethernet protection group administrative state
	Mode	
Interface Working	Slot	Identifies the Working slot

	Port	Identifies the Working Interface
Interface Protecting	Slot	Identifies the Protecting slot
	Port	Identifies the Protecting Interface
	Reversible	Indicates if reversion is enabled (enable|disable)
	WTR (min)	Wait to restore (5..12) min
	Hold Off (x100ms)	Hold Off Time (0 to 100) (x100ms)

"showconfig" command

Table 286. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/eth-protection/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 373. CLI on line help on "showconfig" command usage in this node context

```
/cli/eth-protection> showconfig ?

Usage:
  SHOWCONFIG                Print the command list that enforces the current configuration
```

"status" command

Table 287. "status" command information

Name	status
Description	Show status information for one Protection Group.
Full path	/eth-protection/status
Mandatory Parameters	This command has no parameters
Screen Output	Tables Figure 375.Tables parameter description Table 288

Figure 374. CLI on line help on "status" command usage in this node context

```
/cli/eth-protection> status ?

Usage:
  STATUS                Show status information for one Protection Group.
```

Figure 375. Output of ”status” command in this node context”

```
/cli/eth-protection> status
+-------------------------------------------------------------------------------------------------------------------------------------------+
|Ethernet Protection Group Status                                                                                                           |
+---+-------------------------+-------------------------+                                                                                   |
|   |Interface Working        |Interface Protecting     |                                                                                   |
+---+----+------+--------------+----+------+-------------+---------+------+-----------------------------------+--------------------+
|ID |Slot|Port  |Status        |Slot|Port  |Status       |Active   |WTR(s)|Last Switch-over Cause             |Last Cmd            |
+---+----+------+--------------+----+------+-------------+---------+------+-----------------------------------+--------------------+
+---+----+------+--------------+----+------+-------------+---------+------+-----------------------------------+--------------------+
/cli/eth-protection>
```

Table 288. “status” command output table parameters

Parameter Group	Parameter	Description
	ID	Ethernet protection group Id
Interface Working	Slot	Identifies the Working slot
	Port	Identifies the Working Interface
	Status	Working interface Status information
Interface Protecting	Slot	Identifies the Protecting slot
	Port	Identifies the Protecting Interface
	Status	Protecting interface Status information
	Active	Indicates which interface is active
	WTR (s)	Wait to restore time
	Last Switch-over Cause	Indicates the cause for last switch-over
	Last Cmd	Indicates last executed Command

“gpon-protection” node

Figure 376. “gpon-protection” node tree

```
/cli/gpon-protection> tree
+ gpon-protection[@command, @config, @create, @remove, @show, @showconfig, @status]
```

“command” command

Table 289. "command" command information

Name	command
Description	Execute a command on a given Protection entity.
Full path	/gpon-protection/command
Mandatory Parameters	--ID --type
Screen Output	No

Figure 377. CLI on line help on “command” command usage in this node context

```
/cli/gpon-protection> command ?
```

```
Usage:
  COMMAND                  Execute a command on a given Protection entity.

   <MANDATORY>
   --ID                    Identifies a table entry by ID, in this context.
   --type                  Identify the command to execute (clear|lockout|force-to-protection|force-
to-working|manual-to-protection|manual-to-working)
```

“config” command

Table 290. "config" command information

Name	config
Description	Configure one Protection Group parameters.
Full path	/gpon-protection/config
Mandatory Parameters	--ID
Screen Output	No

Figure 378. CLI on line help on “config” command usage in this node context

```
/cli/gpon-protection> config ?

Usage:
  CONFIG                   Configure one Protection Group parameters.

   <MANDATORY>
   --ID                    Identifies a table entry by ID, in this context.

   [OPTIONAL]
   --admin                 Administrative State. Enable/disable, in this context. (enable|disable)
   --hold-off-time           Hold Off Time (0..100) x100ms
   --hp-lc-fail            high priority: Generalized Line Card Failure (enable|disable)
   --hp-losi-all-onus          high priority: Generalized LOSi on all ONUs connected to this OLT
interface  (enable|disable)
   --p-port                Identifies the Protecting Interface ID. (e.g.: pon.2)
   --p-slot                Identifies the Protecting Interface Slot.
   --reversible             Specify is reversion is enabled (enable|disable)
```

```
--w-port          Identifies the Working Interface ID. (e.g.: pon.2)
--w-slot          Identifies the Working Interface Slot.
--wtr-time        Wait to Restore Time (WTR) (5..12) min
```

“create” command

Table 291. "create" command information

Name	create
Description	Create a new Protection Group.
Full path	/gpon-protection/create
Mandatory Parameters	This command has no mandatory parameters
Screen Output	No

Figure 379. CLI on line help on “create” command usage in this node context

```
/cli/gpon-protection> create ?

Usage:
 CREATE                Create a new Protection Group.

  [OPTIONAL]
  --ID                 Identifies a table entry by ID, in this context.
  --admin              Administrative State. Enable/disable, in this context. (enable|disable)
  --hold-off-time      Hold Off Time (0..100) x100ms
  --hp-lc-fail         high priority: Generalized Line Card Failure (enable|disable)
--hp-losi-all-onus     high priority: Generalized LOSi on all ONUs connected to this OLT
interface  (enable|disable)
  --p-port             Identifies the Protecting Interface ID. (e.g.: pon.2)
  --p-slot             Identifies the Protecting Interface Slot.
  --reversible         Specify is reversion is enabled (enable|disable)
  --w-port             Identifies the Working Interface ID. (e.g.: pon.2)
  --w-slot             Identifies the Working Interface Slot.
  --wtr-time           Wait to Restore Time (WTR) (5..12) min
```

“remove” command

Table 292. "remove" command information

Name	remove
Description	Remove an existing Protection Group.
Full path	/gpon-protection/remove
Mandatory Parameters	--ID
Screen Output	No

Figure 380. CLI on line help on “remove” command usage in this node context

```
/cli/gpon-protection> remove ?

Usage:
  REMOVE                  Remove an existing Protection Group.

   <MANDATORY>
   --ID                   Identifies a table entry by ID, in this context.
```

“show” command

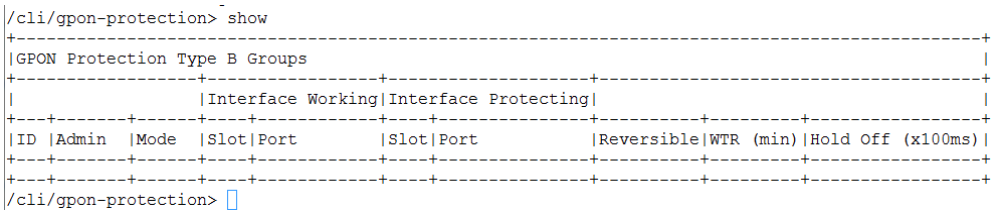
Table 293. "show" command information

Name	show
Description	Show the current configuration.
Full path	/gpon-protection/show
Mandatory Parameters	This command has no mandatory parameters
Screen Output	Tables Figure 382.Tables parameter description Table 294

Figure 381. CLI on line help on “show” command usage in this node context

```
/cli/gpon-protection> show ?

Usage:
  SHOW                    Show the current configuration

   [OPTIONAL]
   --ID                   Identifies a table entry by ID, in this context.
```

Figure 382. Output of "show" command in this node context"



```
/cli/gpon-protection> show
+-------------------------------------------------------------------------------------------------------+
|GPON Protection Type B Groups                                                                          |
+------------------+------------------+--------------------+-------------------------------------+
|                  |Interface Working|Interface Protecting|                                      |
+---+-------+------+----+------------+----+---------------+----------+---------+-----------------+
|ID |Admin  |Mode  |Slot|Port        |Slot|Port           |Reversible|WTR (min)|Hold Off (x100ms)|
+---+-------+------+----+------------+----+---------------+----------+---------+-----------------+
+---+-------+------+----+------------+----+---------------+----------+---------+-----------------+
/cli/gpon-protection>
```

Table 294. "show" command output table parameters

Parameter Group	Parameter	Description
	ID	Ethernet protection group Id
	Admin	Ethernet protection group administrative state
	Mode	
Interface Working	Slot	Identifies the Working slot
	Port	Identifies the Working Interface
Interface Protecting	Slot	Identifies the Protecting slot
	Port	Identifies the Protecting Interface
	Reversible	Indicates if reversion is enabled (enable|disable)
	WTR (min)	Wait to restore (5..12) min
	Hold Off (x100ms)	Hold Off Time (0 to 100) (x100ms)

"showconfig" command

Table 295. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/gpon-protection/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 383. CLI on line help on "showconfig" command usage in this node context

```
/cli/gpon-protection> showconfig ?

Usage:
  SHOWCONFIG                Print the command list that enforces the current configuration
```

“status” command

Table 296. "status" command information

Name	status
Description	Show status information for one Protection Group.
Full path	/gpon-protection/status
Mandatory Parameters	This command has no parameters
Screen Output	Tables Figure 375.Tables parameter description Table 297

Figure 384. CLI on line help on “status” command usage in this node context

```
/cli/gpon-protection> status ?

Usage:
  STATUS                Show status information for one Protection Group.
```

Figure 385. Output of ”status” command in this node context”

```
/cli/gpon-protection> status
+-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------+
|GPON Protection Type B Group Status                                                                                                                                            |
+---+-----------------------+-----------------------+-----------------------------------------------------------------------------------------------------------------------+
|   |Interface Working      |Interface Protecting   |                                                                                                                       |
+---+----+------+-----------+----+------+-----------+---------+-----------------+------+-----------------------------------+-------------------+
|ID |Slot|Port  |Status     |Slot|Port  |Status     |Active   |Sync. Status     |WTR(s)|Last Switch-over Cause             |Last Cmd           |
+---+----+------+-----------+----+------+-----------+---------+-----------------+------+-----------------------------------+-------------------+
+---+----+------+-----------+----+------+-----------+---------+-----------------+------+-----------------------------------+-------------------+
/cli/gpon-protection>
```

Table 297. “status” command output table parameters

Parameter Group	Parameter	Description
	ID	Ethernet protection group Id
Interface Working	Slot	Identifies the Working slot
	Port	Identifies the Working Interface
	Status	Working interface Status information
Interface Protecting	Slot	Identifies the Protecting slot
	Port	Identifies the Protecting Interface
	Status	Protecting interface Status information
	Active	Indicates which interface is active
	Sync. Status	Indicates synchronism Status
	WTR (s)	Wait to restore time
	Last Switch-over Cause	Indicates the cause for last switch-over
	Last Cmd	Indicates last executed Command

“interfaces” node

Figure 386. “interfaces” node tree

```
/cli/interfaces> tree
+ interfaces[]
  + ethernet[@config, @show, @showconfig]
    + cos[@config, @show, @showconfig]
    + services[@add, @availableValues, @config, @remove, @show]
      + statistics[]
        + counters[@availableValues, @show, @show-active, @start, @stop]
        + dhcp[@show]
        + igmp[@show]
    + statistics[@show]
    + status[@show]
      + SFPs[@show]
  + gpon[@config, @show, @showconfig]
    + cos[@config, @show, @showconfig]
    + statistics[]
      + errors[@show]
      + ethernet[@show]
      + gpon[@show]
    + status[@show]
      + SFPs[@show]
      + rx-power[@read-all, @show]
  + lag[@config, @create, @remove, @show, @showconfig]
    + cos[@config, @show, @showconfig]
    + mapping[@attach, @availableValues, @detach]
    + statistics[@show]
    + status[@show]
  + rf-overlay[@config, @show, @showconfig]
    + status[@show]
```

ethernet” sub-node

“config” command

Table 298. "config" command information

Name	config
Description	Configure the given Ethernet interface.
Full path	/interfaces/ethernet/config
Mandatory Parameters	--port --slot
Screen Output	No

Figure 387. CLI on line help on "config" command usage in this node context

```
/cli/interfaces/ethernet> config ?

Usage:
  CONFIG        Configure the given Ethernet interface

   <MANDATORY>
   --port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
   --slotIdentifies a slot.

   [OPTIONAL]
   --admin   Administrative State. Enable/disable, in this context. (enable|disable)
   --esmc     Enables sending SSM packets over ESMCChannel. (enable|disable)
   --media-type  only configurable for card type: 'AMX-48GE' (100-base-X-full|1000-base-
    X-full-auto-neg-on|1000-base-X-full-auto-neg-off)
   --timeout       Set the timeout used by the LACPDUs packets (short|long)(1s|30s)
```

"show" command

Table 299. "show" command information

Name	show
Description	Show the current configuration.
Full path	/interfaces/ethernet/show
Mandatory Parameters	No
Screen Output	Tables Figure 389 and Figure 390 (with argument –slot).Tables parameter description in Table 300 and Table 301.

Figure 388. CLI on line help on "show" command usage in this node context

```
/cli/interfaces/ethernet> show ?

Usage:
 SHOW          Shows Ethernet information for a specific slot.

  [OPTIONAL]
  --slotIdentifies a slot. (not used for LAG)
```

Figure 389. Output of "show" command in this node context

```
/cli/interfaces/ethernet> show
+-------------------------------------+
|General Information                  |
+----+---------------+----------------+
|Slot|Card Name      |Details         |
+----+---------------+----------------+
|1   |XCO-160        |YES             |
|2   |AMX-48GE       |YES             |
|3   |AMX-48GE       |YES             |
|4   |AMX-48GE       |YES             |
|6   |FAN            |                |
+----+---------------+----------------+
/cli/interfaces/ethernet>
```

Table 300. "show" command output table

Parameter	Description
Slot	Slot number
Card Name	Name of the board inserted in a slot
Details	YES, if there are Ethernet interfaces in the board and detailed information the interfaces is available

This command used with arguments provides detailed information on the existing Ethernet interfaces, in the format of a table.

Figure 390. Output of "show" command used with argument --slot, in this node context

```
/cli/interfaces/ethernet> show --slot=1
+-------------------------------------------------------------------------------------------------------------------------------+
|Slot 1 XCO-160 - Ethernet Configuration                                                                                        |
+---+----------+----------+----------+----------+-----------------------+---------------+-----+----------+------------+
|ID |Name      |Admin     |LAG       |Timeout   |Media Type             |Flow Control   |MTU  |ESMC      |IP Src Guard|
+---+----------+----------+----------+----------+-----------------------+---------------+-----+----------+------------+
|0  |Eth 1     |enable    |--        |--        |10G BASE X             |Disabled       |2048 |Disabled  |--          |
|1  |Eth 2     |disable   |--        |--        |10G BASE X             |Disabled       |2048 |Disabled  |--          |
+---+----------+----------+----------+----------+-----------------------+---------------+-----+----------+------------+
/cli/interfaces/ethernet>
```

Table 301. "show" command output used with argument --slot

Parameter	Description
ID	Interface ID (number)

Name	Name of the board inserted in a slot
Admin	Interface administrative state
LAG	Lag identification
Timeout	Timeout used by the LACPDUs packets (short|long)
Media Type	Interface standard
Flow Control	(enabled|disabled)
MTU	Maximum transfer unit (number
ESMC	SSM packets over ESMC Channel sending (enabled|disabled)

"showconfig" command

Table 302. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/cli/interfaces/ethernet/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 391. CLI on line help on "showconfig" command usage in this node context

```
/cli/interfaces/ethernet> showconfig ?

Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

"cos" sub-node

"config" command

Table 303. "config" command information

Name	config
Description	Configure CoS information for Eth interfaces.
Full path	/interfaces/ethernet/cos/config
Mandatory Parameters	--cos --port --slot
Screen Output	No

Figure 392. CLI on line help on "config" command usage in this node context

```
/cli/interfaces/ethernet/cos> config ?

Usage:
 CONFIG        Configure CoS information for Eth interfaces.

  <MANDATORY>
  --cos Identifies a Class of Service (1..8)
  --port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot.

  [OPTIONAL]
  --pcp-bitsIdentifies the p-bits associated to the Class of Service. (0..7)
  --profileID     Identifies a profile by ID.
  --scheduler     Identifies the type of Scheduler (strict|weighted)
```

"show" command

This command used without arguments provides information on all the equipment Ethernet interfaces CoS configuration: CoS traffic profile and scheduler policy. When used with the argument slot it displays that information only for the specific slot.

Table 304. "show" command information

Name	show
Description	Show the current CoS configuration.
Full path	/interfaces/ethernet/cos/show
Mandatory Parameters	No
Screen Output	Tables Figure 394. Table parameter description in Table 305.

Figure 393. CLI on line help on "show" command usage in this node context

```
/cli/interfaces/ethernet/cos> show ?

Usage:
 SHOW          Show the current CoS configuration
```

[OPTIONAL] --slotIdentifies a slot. (not used for LAG)

Figure 394. Partial view of output of "show" command in this node context

```
/cli/interfaces/ethernet/cos> show
+-------------------------------------------------------------------------------+
|Card 1 - XCO-160: Ethernet CoS Bit Mapping                                     |
+----------+---+---------------+------------------------------+----------+
|          |   |PCPs           |                              |          |
+----------+---+-+-+-+-+-+-+-+-+------------------------------+----------+
|Port      |CoS|0|1|2|3|4|5|6|7|(ID) Ethernet Profile         |Scheduler |
+----------+---+-+-+-+-+-+-+-+-+------------------------------+----------+
|Eth 1     |1  |x| | | | | | | |(0)No Profile                 |strict    |
|          |2  | |x| | | | | | |(0)No Profile                 |strict    |
|          |3  | | |x| | | | | |(0)No Profile                 |strict    |
|          |4  | | | |x| | | | |(0)No Profile                 |strict    |
|          |5  | | | | |x| | | |(0)No Profile                 |strict    |
|          |6  | | | | | |x| | |(0)No Profile                 |strict    |
|          |7  | | | | | | |x| |(0)No Profile                 |strict    |
|          |8  | | | | | | | |x|(0)No Profile                 |strict    |
+----------+---+-+-+-+-+-+-+-+-+------------------------------+----------+
|Eth 2     |1  |x| | | | | | | |(0)No Profile                 |strict    |
|          |2  | |x| | | | | | |(0)No Profile                 |strict    |
|          |3  | | |x| | | | | |(0)No Profile                 |strict    |
|          |4  | | | |x| | | | |(0)No Profile                 |strict    |
|          |5  | | | | |x| | | |(0)No Profile                 |strict    |
|          |6  | | | | | |x| | |(0)No Profile                 |strict    |
|          |7  | | | | | | |x| |(0)No Profile                 |strict    |
|          |8  | | | | | | | |x|(0)No Profile                 |strict    |
+----------+---+-+-+-+-+-+-+-+-+------------------------------+----------+
+-------------------------------------------------------------------------------+
|Card 2 - AMX-48GE: Ethernet CoS Bit Mapping                                    |
```

Table 305. "show" command output table

Parameter	Description
Table title	Card #(slot number) –name of the card inserted in that slot
Port	Ethernet port identification in the board
CoS	Class of Service identification (Number 1..8)
PCPs	p-bit associated to the Class of Service (0..8) marked X
(ID)	Profile ID (number)
Ethernet Profile	Profile Name
Scheduler	Scheduler policy (strict|weighted)

This command used with arguments provides detailed information on the existing Ethernet interfaces, in the format of a table.

"showconfig" command

Table 306. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/interfaces/ethernet/cos/showconfig

Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 395. CLI on line help on "showconfig" command usage in this node context

```
/cli/interfaces/Ethernet/cos> showconfig ?

Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

"services" sub-node

"add" command

Table 307. "add" command information

Name	add
Description	Add a client service to map one Ethernet interface to an existing network service.
Full path	/interfaces/ethernet/services/add
Mandatory Parameters	--ethernet-profileID --name --port --serviceID --slot
Screen Output	No

Figure 396. CLI on line help on "add" command usage in this node context

```
/cli/interfaces/ethernet/services> add ?

Usage:
  ADD                    Add a client service to map one Ethernet interface to an existing network
service.

  <MANDATORY>
  --ethernet-profileID        Choose an existing Ethernet profile by ID
  --name                    Set a name for this Client Service (STRING 65)
  --port                   Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --serviceID                Select an OLT service by ID.
  --slot                   Identifies a slot.
```

```
[OPTIONAL]
--admin                  Administrative State. Enable/disable, in this context. (enable|disable)
--dhcp-op18              DHCP Op.18 flag
--dhcp-op37              DHCP Op.37 flag
--dhcp-op82              DHCP Op.82 flag
--igmp                   IGMP flag
--mac-limit              Specifies the maximum number of MAC addresses allowed for a given client service (unlimited or 1..99)
--nni-ctag               Inner VLAN ID (client) on the network-facing (Ethernet) interface. (1..4094)
--remoteID               Remote ID field added to DHCP packets in DHCPop.82 enabled services. (STRING 63)
--uni-ctag               VLAN ID delivered/received from the (Ethernet) subscriber-facing interface at the ONU. (1..4094)
--use-global-dhcp-ops    Use DHCP options defined in the OLT global service.
--use-global-igmp        Use the IGMP options defined in the OLT global service. (enable|disable)
```

"availableValues" command

Table 308. "availableValues" command information

Name	availableValues
Description	Shows available options for each argument.
Full path	/interfaces/ethernet/services/availableValues
Mandatory Parameters	No
Screen Output	Tables Figure 398. Tables parameter description in Table 309 and Table 310.

Figure 397. CLI on line help on "show" command usage in this node context

```
/cli/interfaces/ethernet/services> availableValues ?

Usage:
 AVAILABLEVALUES
```

Figure 398. Output of ”availableValues” command in this node context

```
/cli/interfaces/ethernet/services> availableValues
+-----------------------------------------------+
|Available Interfaces For Client Services       |
+-----+----------+------------------------------+
|Slot |Card Name |Eth Interfaces                |
+-----+----------+------------------------------+
|2    |AMX-48GE  |All                           |
|3    |AMX-48GE  |All                           |
|4    |AMX-48GE  |All                           |
+-----+----------+------------------------------+

+-------------------------------------------------------------------------------------+
|Available Network Services To associate with Client Services                         |
+---+------------------------------+--------+--------+--------+--------------------+
|ID |Name                          |Admin   |NNI-STAG|UNI-CTAG|Slot                |
+---+------------------------------+--------+--------+--------+--------------------+
|1  |1031                          |enable  |1031    |100     | 2 AMX-48GE         |
|   |                              |        |        |        | 3 AMX-48GE         |
|   |                              |        |        |        | 4 AMX-48GE         |
+---+------------------------------+--------+--------+--------+--------------------+
|2  |1032                          |enable  |1032    |100     | 2 AMX-48GE         |
|   |                              |        |        |        | 3 AMX-48GE         |
|   |                              |        |        |        | 4 AMX-48GE         |
+---+------------------------------+--------+--------+--------+--------------------+
|3  |1033                          |enable  |1033    |100     | 2 AMX-48GE         |
|   |                              |        |        |        | 3 AMX-48GE         |
|   |                              |        |        |        | 4 AMX-48GE         |
+---+------------------------------+--------+--------+--------+--------------------+
|4  |1034                          |enable  |1034    |100     | 2 AMX-48GE         |
|   |                              |        |        |        | 3 AMX-48GE         |
|   |                              |        |        |        | 4 AMX-48GE         |
+---+------------------------------+--------+--------+--------+--------------------+
/cli/interfaces/ethernet/services>
```

Table 309. “Available interfaces for client services”

Parameter	Description
Slot	Slot number
Card Name	Name of the card inserted in the slot
Ethernet interfaces	Available card ethernet interfaces

Table 310. “Available network services to associate with client services”

Parameter	Description
ID	Network service identifier (number)
Name	Network service name
Admin	Network service administrative status
NNI-STAG	Outer VLAN ID (service) on the network-facing (Ethernet) interface.(1..4094)
UNI-CTAG	VLAN ID delivered/received from the (Ethernet) subscriber-facing interface at the ONU. (1..4094)
Slot	Slot where the network service is available (number)

“config” command

Table 311. "config" command information

Name	config
Description	Configure client service parameters.
Full path	/interfaces/ethernet/services/config
Mandatory Parameters	--serviceID-client
Screen Output	No

Figure 399. CLI on line help on "config" command usage in this node context

```
/cli/interfaces/ethernet/services> config ?

Usage:
 CONFIG        Configure client service parameters.

  <MANDATORY>
  --serviceID-client   Choose a client service by ID.

  [OPTIONAL]
  --admin   Administrative State. Enable/disable, in this context. (enable|disable)
  --dhcp-op18   DHCP Op.18 flag
  --dhcp-op37   DHCP Op.37 flag
  --dhcp-op82   DHCP Op.82 flag
  --ethernet-profileID     Choose an existing Ethernet profile by ID
  --name    Insert a name STRING.
  --nni-ctag     Inner VLAN ID (client) on the network-facing (Ethernet) interface.
   (1..4094)
  --remoteID    Remote ID field added to DHCP packets in DHCPop.82 enabled
   services.
  --serviceID    Select an OLT service by ID.
  --uni-ctag     VLAN ID delivered/received from the (Ethernet) subscriber-facing
   interface at the ONU. (1..4094)
  --use-global-dhcp-ops  Use DHCP options defined in the OLT global service.
```

"remove" command

Table 312. "remove" command information

Name	remove
Description	Remove an existing service

Full path	/interfaces/ethernet/services/remove
Mandatory Parameters	--serviceID-client
Screen Output	No

Figure 400. CLI on line help on "remove" command usage in this node context

```
/cli/interfaces/ethernet/services> remove ?

Usage:
  REMOVE        Remove an existing service.

  <MANDATORY>
  --serviceID-client  Choose a client service by ID.
```

"show" command

This command used without arguments provides information on the slots and cards for which detailed information on services is available. When used with the argument slot it displays that service information for the specified slot.

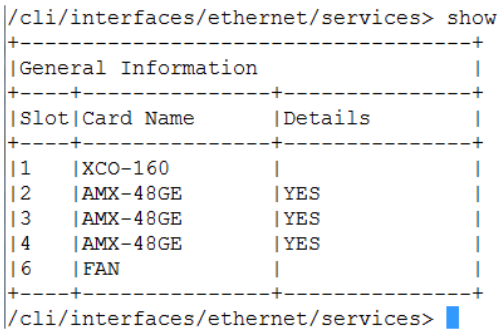
Table 313. "show" command information

Name	show
Description	Show the current ethernet Services configuration.
Full path	/interfaces/ethernet/services/show
Mandatory Parameters	No
Screen Output	Tables, Figure 402 and Figure 403. Tables parameters description in Table 314 and Table 315.

Figure 401. CLI on line help on "show" command usage in this node context

```
/cli/interfaces/ethernet/services> show ?

Usage:
  SHOW          Show the current ethernet Services configuration

  [OPTIONAL]
  --serviceID-client  Choose a client service by ID.
  --slotIdentifies a slot. (not used for LAG)
```

Figure 402. Output of "show" command in this node context



```
/cli/interfaces/ethernet/services> show
+-----------------------------------+
|General Information                |
+----+---------------+--------------+
|Slot|Card Name      |Details       |
+----+---------------+--------------+
|1   |XCO-160        |              |
|2   |AMX-48GE       |YES           |
|3   |AMX-48GE       |YES           |
|4   |AMX-48GE       |YES           |
|6   |FAN            |              |
+----+---------------+--------------+
/cli/interfaces/ethernet/services>
```

Table 314. "show" command output table parameters

Parameter	Description
Slot	Slot number
Card Name	Name of the card inserted in the slot
Details	If Yes detailed information on services is available via show command with argument --slot

Figure 403. Output of "show" command used with argumente slot, in this node context

```
/cli/interfaces/ethernet/services> show --slot=2
+-------------------------------------------------------------------------------------------------------------------+
|Client Services on Slot 2 AMX-48GE                                                                                 |
+---+-------+--------+-------------------+-------------------+-------------------------+--------+--------+
|ID |Port   |Admin   |Name               |OLT (ID)Service-Name|Upstream Ethernet Profile|NNI-CTAG|UNI-CTAG|
+---+-------+--------+-------------------+-------------------+-------------------------+--------+--------+
|1  |Eth 1  |enable  |1031 101           |(1) 1031           |(1) CIR_1G_Default       |101     |101     |
|2  |Eth 1  |enable  |1032 201           |(2) 1032           |(0) No Profile           |201     |201     |
|3  |Eth 1  |enable  |1033 301           |(3) 1033           |(0) No Profile           |301     |301     |
|4  |Eth 1  |enable  |1034 401           |(4) 1034           |(0) No Profile           |401     |401     |
|5  |Eth 3  |enable  |1031 102           |(1) 1031           |(0) No Profile           |102     |102     |
|6  |Eth 3  |enable  |1032 202           |(2) 1032           |(0) No Profile           |202     |202     |
|7  |Eth 3  |enable  |1033 302           |(3) 1033           |(0) No Profile           |302     |302     |
```

Table 315. "show" command output table parameters

Parameter	Description
ID	Client Service ID (number)
Port	Port where the Client service is available
Admin	Administrative state of the Client service
Name	Name of the client service
OLT(ID) Service-Name	Identification of the OLT service (ID and Name)
Ethernet Profile	
NNI-CTAG	Inner VLAN ID (client) on the network-facing (Ethernet) interface.(1..4094)
UNI-CTAG	VLAN ID delivered/received from the (Ethernet) subscriber-facing interface at the ONU. (1..4094)

"showconfig" command

Table 316. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/interfaces/ethernet/cos/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 404. CLI on line help on "showconfig" command usage in this node context

```
/cli/interfaces/Ethernet/cos> showconfig ?

Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

"statistics" sub-node

"counters" sub-node

""availableValues" command

Table 317. "availableValues" command information

Name	availableValues
Description	Display all client services where counters can be activated
Full path	/interfaces/ethernet/services/statistics/counters/availableValues
Mandatory Parameters	This command has no parameters
Screen Output	Table, Figure 406. Table parameters description in Table 318.

Figure 405. CLI on line help on "availableValues" command usage in this node context

```
/cli/interfaces/ethernet/services/statistics/counters> availableValues ?

Usage:
  AVAILABLEVALUES Display all client services where counters can be activated.
```

Figure 406. Output of ”availableValues” command in this node context

```
/cli/interfaces/ethernet/services/statistics/counters> availableValues
+-----------------------------------------------------+
|Client Services Where Counters Can Be Activated      |
+-----------------------------------------------------+
|Client Service (ID) Name                             |
+-----------------------------------------------------+
|(5) 1031 102                                         |
|(6) 1032 202                                         |
|(7) 1033 302                                         |
|(8) 1034 402                                         |
|(9) 1031 103                                         |
|(10) 1032 203                                        |
|(11) 1033 303                                        |
|(12) 1034 403                                        |
|(13) 1031 104                                        |
```

Table 318. “availableValues” command output table parameters

Parameter	Description
Client Service (ID) Name	Available Client Service identified by Service ID (number) and Service Name

““show” command

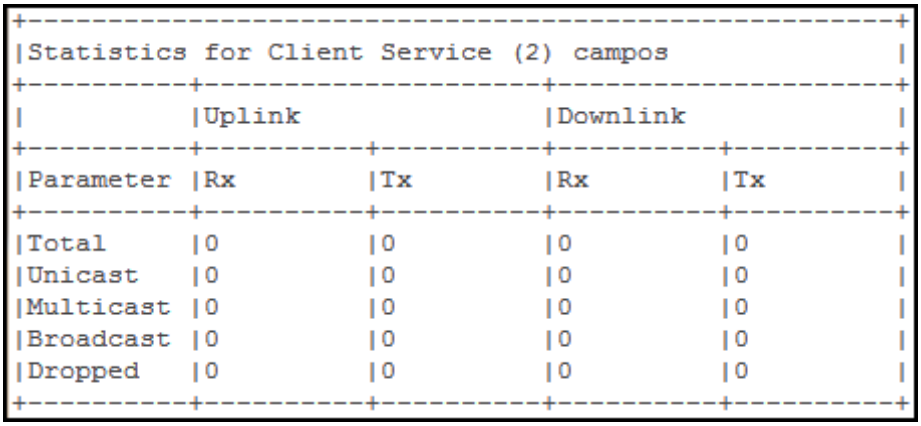
Table 319. "show" command information

Name	show
Description	Show the statistics for a given client service, whose counter has already been activated.
Full path	/interfaces/ethernet/services/statistics/counters/show
Mandatory Parameters	--serviceID-client
Screen Output	Table, Figure 408. Table parameter description in Table 320

Figure 407. CLI on line help on “show” command usage in this node context

```
/cli/interfaces/ethernet/services/statistics/counters> show ?

Usage:
 SHOW          Show the statistics for a given client service, whose counter has already
been activated.

  <MANDATORY>
  --serviceID-client  Choose a client service by ID.
```

Figure 408. Output of "show" command in this node context



```
+-----------------------------------------------------+
|Statistics for Client Service (2) campos             |
+----------+--------------------+---------------------+
|          |Uplink              |Downlink             |
+----------+----------+---------+----------+----------+
|Parameter |Rx        |Tx       |Rx        |Tx        |
+----------+----------+---------+----------+----------+
|Total     |0         |0        |0         |0         |
|Unicast   |0         |0        |0         |0         |
|Multicast |0         |0        |0         |0         |
|Broadcast |0         |0        |0         |0         |
|Dropped   |0         |0        |0         |0         |
+----------+----------+---------+----------+----------+
```

Table 320. "show" command output table

Parameter	Description
Total	Total number of packets (Unicast+Multicast+Broadcast+Dropped) Uplink Rx/Tx‖Downlink Rx/Tx
Unicast	Number of Unicast packets Uplink Rx/Tx‖Downlink Rx/Tx
Multicast	Number of Multicast packets Uplink Rx/Tx‖Downlink Rx/Tx
Broadcast	Number of Broadcast packets Uplink Rx/Tx‖Downlink Rx/Tx
Dropped	Number of Dropped packets Uplink Rx/Tx‖Downlink Rx/Tx

"show-active" command

Table 321. "show-active" command information

Name	Show-active
Description	Display all active counters.
Full path	/interfaces/ethernet/services/statistics/counters/show-active
Mandatory Parameters	This command has no parameters
Screen Output	Table Figure 410. Table parameters description in Table 322

Figure 409. CLI on line help on "show" command usage in this node context

```
/cli/interfaces/ethernet/services/statistics/counters> show-active ?


Usage:
  SHOW-ACTIVE     Display all active counters.
```

Figure 410. Output of ”show-active” command in this node context

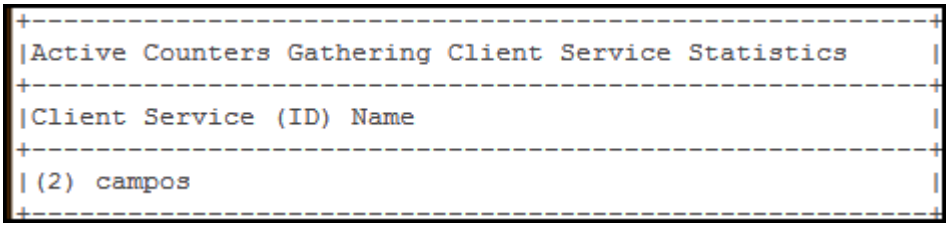


Table 322. “show-active” command output table

Parameter	Description
Client Service (ID) Name	Client Service identified by Service ID (number) and Service Name with active counters gathering service statistics

““start” command

Table 323. "start" command information

Name	start
Description	Start the statistics counter for a given client service.
Full path	/interfaces/ethernet/services/statistics/counters/start
Mandatory Parameters	--serviceID-client
Screen Output	No

Figure 411. CLI on line help on “start” command usage in this node context

```
/cli/interfaces/ethernet/services/statistics/counters> start ?

Usage:
  START          Start the statistics counter for a given client service.

  <MANDATORY>
  --serviceID-client  Choose a client service by ID.
```

““stop” command

Table 324. "stop" command information

Name	stop
Description	Stop an active statistics counter.
Full path	/interfaces/ethernet/services/statistics/counters/stop

Mandatory Parameters	--serviceID-client
Screen Output	No

Figure 412. CLI on line help on "stop" command usage in this node context

```
cli/interfaces/ethernet/services/statistics/counters> stop ?

Usage:
  STOP          Stop an active statistics counter.

  <MANDATORY>
  --serviceID-client  Choose a client service by ID.
```

"dhcp"sub-node

""show" command

Table 325. "show" command information

Name	show
Description	Show DHCP statistics for a client service with DHCP enabled.
Full path	/interfaces/ethernet/services/statistics/dhcp/show
Mandatory Parameters	--serviceID-client
Screen Output	Table

Figure 413. CLI on line help on "show" command usage in this node context

```
/cli/interfaces/ethernet/services/statistics/ dhcp>show ?

Usage:
  SHOW          Show DHCP statistics for a client service with DHCP enabled.

  <MANDATORY>
  --serviceID-client  Choose a client service by ID.
```

"igmp" sub-node

""show" command

Table 326. "show" command information

Name	show
Description	Show the IGMP statistics for a given multicast client service.
Full path	/interfaces/ethernet/services/statistics/igmp/show
Mandatory Parameters	--serviceID-client
Screen Output	Table

Figure 414. CLI on line help on "show" command usage in this node context

```
/cli/interfaces/ethernet/services/statistics/ igmp>show ?

Usage:
  SHOW          Show the IGMP statistics for a given multicast client service.

  <MANDATORY>
  --serviceID-client  Choose a client service by ID.
```

"statistics" sub-node

"show" command

Table 327. "show" command information

Name	show
Description	Show the current ethernet statistics.
Full path	/interfaces/ethernet/statistics/show
Mandatory Parameters	--port --slot
Screen Output	Figure 416. Table parameters description in Table 328

Figure 415. CLI on line help on "show" command usage in this node context

```
/cli/interfaces/ethernet/ statistics>show ?

Usage:
  SHOW          Show the current ethernet statistics.
```

<MANDATORY>

--port Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)

--slotIdentifies a slot..

Figure 416. Output of "show" command in this node context

```
/cli/interfaces/ethernet/statistics> show --slot=2 --port=eth.2
+-------------------------------------------------------------------------------------------+
|Slot 2 Eth 2 - Ethernet Statistics                                                         |
+-------------------------+-------------------------------+-------------------------------+
|Parameter                |Rx                             |Tx                             |
+-------------------------+---------------+---------------+---------------+---------------+
|                         |Total          |Partial        |Total          |Partial        |
+-------------------------+---------------+---------------+---------------+---------------+
|Drop Events              |0              |0              |0              |0              |
|Octets                   |0              |0              |0              |0              |
|Packets                  |0              |0              |0              |0              |
|Broadcast Packets        |0              |0              |0              |0              |
|Multicast Packets        |0              |0              |0              |0              |
|CRC Align Errors         |0              |0              |0              |0              |
|Undersize Packets        |0              |0              |0              |0              |
|Oversize Packets         |0              |0              |0              |0              |
|Fragments                |0              |0              |0              |0              |
|Jabbers                  |0              |0              |0              |0              |
|Collisions               |0              |0              |0              |0              |
|Packets     64    Octets |0              |0              |0              |0              |
|Packets   65-127  Octets |0              |0              |0              |0              |
|Packets  128-255  Octets |0              |0              |0              |0              |
|Packets  256-511  Octets |0              |0              |0              |0              |
|Packets  512-1023 Octets |0              |0              |0              |0              |
|Packets   >=1024  Octets |0              |0              |0              |0              |
|Throughput (bps)         |0              |-              |0              |-              |
+-------------------------+---------------+---------------+---------------+---------------+
qPress 'q' to quit or 'r' to reset
/cli/interfaces/ethernet/statistics>
```

Table 328. "show" command output table

Parameter	Description
Rx Total & Partial	Received total & partial counters
Tx Total & Partial	Transmitted total & partial counters
Drop Events	Number of dropped packets
Octets	Number of bytes
Packets	Number of Packets
Broadcast Packets	Number of Broadcast Packets
Multicast Packets	Number of Multicast Packets
CRC Align Errors	Number of packets with wrong FCS (Frame Check Sequence)
Undersize Packets	Number of packets with size less than 64 bytes
Oversize Packets	Number of packets with size over than 1518 bytes
Fragments	Number of packets with size less than 64 bytes and with wrong FCS (Frame Check Sequence)
Jabbers	Number of packets with size over than 1518 bytes and with wrong FCS (Frame Check Sequence)
Collisions	Number of collisions in the Ethernet Segment (only in Half Duplex)
Buffer Overflows	
Packets 64 Octets	Number of 64 bytes packets
Packets 65-127 Octets	Number of packets with size between 65 to 127 bytes

Packets 128-255 Octets	Number of packets with size between 128 to 255 bytes
Packets 256-511 Octets	Number of packets with size between 256 to 511 bytes
Packets 512-1023 Octets	Number of packets with size between 512 to 1023 bytes
Packets >=1024 Octets	Number of packets with size equal to or higher than 1024 bytes
Throughput (bps)	Indicates approximately the received and transmitted bit rate

"status" sub-node

"show" command

Table 329. "show" command information

Name	show
Description	Show status information for Eth interfaces
Full path	/interfaces/ethernet//status/show
Mandatory Parameters	--slot
Screen Output	Table Figure 418. Table parameters description in Table 330.

Figure 417. CLI on line help on "show" command usage in this node context

```
/cli/interfaces/ethernet/status> show ?

Usage:
 SHOW        Show status information for Eth interfaces.

  <MANDATORY>
  --slotIdentifies a slot.
```

Figure 418. Partial view of "show" command output in this node context

```
/cli/interfaces/ethernet/status> show --slot=2
+-------------------------------------------------------------------------------------------------------------------------------------------------------------------+
|Slot 2 - Ethernet Interfaces Status                                                                                                                                |
+----------+-------+----------+-----------+--------------------+----------+-----------+--------------------+-----------------+-----------------+--------+-----+
|          |       |          |           |                    |          |Status     |                    |Power (dbm)      |                 |        |     |
+----------+-------+----------+-----------+--------------------+----------+-----+---+---+--------------------+--------+--------+-----------------+--------+-----+
|Interface |Admin  |High Layer|Auto Neg   |Media Type          |Collisions|Link|Tx |Rx |SFP/XFP             |Tx      |Rx      |Bias Current (mA)|Temp(C) |Laser|
+----------+-------+----------+-----------+--------------------+----------+----+---+---+--------------------+--------+--------+-----------------+--------+-----+
|Eth 1     |enable |none      |--         |1000BASE-X          |NO        |YES |NO |YES|--                  |--      |--      |--               |--      |--   |
|Eth 2     |disable|--        |--         |--                  |--        |--  |-- |-- |--                  |--      |--      |--               |--      |--   |
|Eth 3     |enable |none      |--         |1000BASE-X          |NO        |YES |NO |YES|--                  |--      |--      |--               |--      |--   |
|Eth 4     |disable|--        |--         |--                  |--        |--  |-- |-- |--                  |--      |--      |--               |--      |--   |
|Eth 5     |enable |none      |--         |1000BASE-X          |NO        |YES |NO |YES|--                  |--      |--      |--               |--      |--   |
|Eth 6     |disable|--        |--         |--                  |--        |--  |-- |-- |--                  |--      |--      |--               |--      |--   |
```

Table 330. "show" command output table

Parameter	Description
Interface	Ethernet Interface identifier
Admin	Ethernet port Administrative State
High layer	Indicates to each LAG (in case the port is a LAG member) the port belongs to
Auto Neg	If the port is configured to Auto negotiation, indicates the Auto Negotiation State
Media Type	Link Speed by indicating the applicable standard
Collisions	Not applicable in Full Duplex interfaces
Status Link	Indicates the Link State
Status Tx	Indicates if the interface is transmitting packets
Status Rx	Indicates if the interface is receiving packets
SFP/XFP	SFP/XFP module designation
Power Tx (dBm)	Indicates the transmitted optical power in dBm
Power Rx (dBm)	Indicates the received optical power in dBm
Bias Current (mA)	Indicates the laser BIAS current in mA
Temperature (ºC)	Indicates the XFP module temperature in ºC
Laser	Indicates the Laser operational States (ON|OFF)

"SFPs" sub-node

""show" command

Table 331. "show" command information

Name	show
Description	Show details for an SFP entry from table ethernet/status/show.
Full path	/interfaces/ethernet/status/SFPs/show
Mandatory Parameters	--port
Screen Output	Table, Figure 419.

Figure 419. CLI on line help on "show" command usage in this node context

```
/cli/interfaces/ethernet/status/SFPs> show ?

Usage:
 SHOW          Show details for an SFP entry from table ethernet/status/show

 <MANDATORY>
 --port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)

 [OPTIONAL]
```

--slot	Identifies a slot. (not used for LAG)

This command displays for the SFPs/XFPs inserted in the specified port, slot, the Base ID fields and the Extended ID fields' information

Figure 420. Output of "show" command in this node context

```
+-------------------------------------------------------------------------------------------------+
|XFP Info - Slot  2  Eth 3                                                                        |
+------------------------------+------------------------------------------------------------------+
|Parameter                     |Value                                                             |
+------------------------------+------------------------------------------------------------------+
|Base ID Fields                |
|   Identifier                 |SFP
|   Ext-Identifier:            |
|                              |No CLEI code present
|                              |TX Ref Clock Input Required
|                              |Module with CDR function
|                              |Power Level 1 Module (1.5 W max. power dissipation.)
|   Connector                  |LC
|   Transceiver                |212000101h
|   Encoding                   |8B10B
|   Min BitRate      (MBits/s) |1300
|   Max BitRate      (MBits/s) |0
|   Length SFM            (Km) |10
|   Length (50um)          (m) |550
|   Length (62.5um)        (m) |55
|   Length (Copper)        (m) |0
|   Device Technology:         |
|                              |Transmitter not Tunable
|                              |PIN detector
|                              |Uncooled transmitter
|                              |No wavelength control
|                              |850 nm VCSEL
|   Vendor Name                |SumitomoElectric
|   CDR Support:               |
|                              |--
|   Vendor OUI                 |00005F
|   Vendor Serial Number       |SCP6G44-GL-BWH
|   Vendor Revision            |A
|   Laser Wavelength      (nm) |411
|   Laser Wave. Tolerance (nm) |6
|   Max Case Temperature   (C) |0
+------------------------------+------------------------------------------------------------------+
|Extended ID Fields            |
|   Power Supply Information:  |
|                              |Max Power Dissipation                              0 (mW)
|                              |Max Total Power Dissipation in Power Down Mode     0 (mW)
|                              |Max current required by +5V Supply                 0 (mA)
|                              |Max current required by +3.3V Supply               0 (mA)
|                              |Max current required by +1.8V Supply               0 (mA)
|                              |Max current required by -5.2V Supply               0 (mA)
|   Vendor Serial Number       |92T407000848
|   Date Code                  |09/02/20
|   Diagnostic Monitoring Type:|
|                              |Received power measurement type = Average Power
|                              |Internally Calibrated
|                              |Digital diagnostic monitoring implemented
|   Enhanced Options:          |
|                              |Optional Soft RX_LOS monitoring implemented
|                              |Optional Soft TX_FAULT monitoring implemented
|                              |Optional Soft TX_DISABLE control and monitoring implemented
|                              |Optional Alarm/Warning flags implemented for all monitored quantities
+------------------------------+------------------------------------------------------------------+
```

"active-channels" sub-node

""show" command

Table 332. "show" command information

Name	show
Description	Show the active channels on a given Client Service.
Full path	/interfaces/ethernet/status/active-channels/show
Mandatory	--port

Parameters	--serviceID-client --slot
Screen Output	Table,Figure 422.

Figure 421. CLI on line help on "show" command usage in this node context

```
/cli/interfaces/ethernet/status/active-channels> show ?

Usage:
  SHOW                  Show the active channels on a given Client Service.

  <MANDATORY>
  --port                Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --serviceID-client    Choose a client service by ID.
  --slot                Identifies a slot.
```

Figure 422. Output of "show" command in this node context

```
/cli/interfaces/ethernet> status/active-channels/show --port=lag.2 --serviceID-client=2 --slot=8
Could not get Channels information for Client service (2) IPTV:
        Error: Family ONU | No active unicast IGMPservice for this ONU | (0x1D0348C2) |
+-------------------------------------------------------------------+
|Active Channels on Client Service: (2) IPTV                        |
+--------------------+----------------------------------------------+
|Source IP           |IP Address                                    |
+--------------------+----------------------------------------------+
+--------------------+----------------------------------------------+
```

"vlan" sub-node

"config" command

Table 333. "config" command information

Name	config
Description	Configure vlan information for Eth interfaces.
Full path	/interfaces/ethernet/vlan/config
Mandatory Parameters	--port --slot
Screen Output	No

Figure 423. CLI on line help on "config" command usage in this node context

```
/cli/interfaces/ethernet/vlan> config ?

Usage:
  CONFIG                    Configure vlan information for Eth interfaces.

  <MANDATORY>
  --port                    Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slot                    Identifies a slot.

  [OPTIONAL]
  --acceptable-frame-types  Acceptable frame types
                            {default: all / range: 0 - all, 1 - untagged only, 2 - tagged only}
  --default-priority        Priority applied {default: 0 / range: 0..7}
  --default-vlan-id         VlanId applied to all income untagged frames
                            {default: 1 / range: 1..4095}
```

"show" command

Table 334. "show" command information

Name	show
Description	Show the current vlan configuration.
Full path	/interfaces/Ethernet/vlan/show
Mandatory Parameters	No
Screen Output	Tables Figure 425. Tables parameter description inTable 335.

Figure 424. CLI on line help on "show" command usage in this node context

```
/cli/interfaces/ethernet/vlan> show ?

Usage:
  SHOW                  Show the current vlan configuration

  [OPTIONAL]
  --slot                Identifies a slot. (not used for LAG)
```

Figure 425. Output of ”show” command in this node context- partial view

```
/cli/interfaces/ethernet/vlan> show
+-----------------------------------------------------------------------------------------+
|Card 1 - XCO-160: VLAN Configuration                                                     |
+----------+---------------+--------------------------+---------------+-------------------+
|ID        |Name           |Acceptable Frame Types    |Default VLANID |Default Priority   |
+----------+---------------+--------------------------+---------------+-------------------+
|0         |Eth 1          |all                       |1              |0                  |
|1         |Eth 2          |all                       |1              |0                  |
+----------+---------------+--------------------------+---------------+-------------------+
+-----------------------------------------------------------------------------------------+
|Card 2 - AMX-48GE: VLAN Configuration                                                    |
+----------+---------------+--------------------------+---------------+-------------------+
|ID        |Name           |Acceptable Frame Types    |Default VLANID |Default Priority   |
+----------+---------------+--------------------------+---------------+-------------------+
|0         |Eth 1          |all                       |1              |0                  |
|1         |Eth 2          |all                       |1              |0                  |
|2         |Eth 3          |all                       |1              |0                  |
|3         |Eth 4          |all                       |1              |0                  |
|4         |Eth 5          |all                       |1              |0                  |
|5         |Eth 6          |all                       |1              |0                  |
```

Table 335. “show” command output table

Parameter	Description
ID	Table entry identifier (number)
Name	Ethernet interface identifier
Acceptable Frame Types	Indicates acceplatble frame type
Default VLANID	Indicates used default VLAN identifier
Defulat Priority	Indicates used default Priority

“showconfig” command

Table 336. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/interfaces/Ethernet/vlan/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 426. CLI on line help on “showconfig” command usage in this node context

```
/cli/interfaces/Ethernet/vlan> showconfig ?

Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

“gpon” sub-node

“config” command

Table 337. "config" command information

Name	config
Description	Configure the given PON interfaces.
Full path	/interfaces/gpon/config
Mandatory Parameters	--port --slot
Screen Output	No

Figure 427. CLI on line help on "config" command usage in this node context

```
/cli/interfaces/gpon> config ?

Usage:
  CONFIG        Configure the given PON interfaces.

   <MANDATORY>
   --port       Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
   --slotIdentifies a slot.

   [OPTIONAL]
   --admin    Administrative State. Enable/disable, in this context. (enable|disable)
   --mac-agging Time it takes for a MAC address to be removed from the GPON MAC
    table.(120s:3600s)
   --max-distance     Sets the maximum distance in km for which the interface can detect
ONUs.       (20:60)
   --min-distance     Sets the minimum distance in km for which the interface can detect
ONUs.       (0:40)
```

"show" command

Table 338. "show" command information

Name	show
Description	Shows PON information for a specific HW slot.
Full path	/interfaces/gpon/show
Mandatory Parameters	No
Screen Output	Tables Figure 429 and Figure 430 (with argument –slot).Tables parameter description inTable 339 and Table 340.

Figure 428. CLI on line help on “show” command usage in this node context

```
/cli/interfaces/gpon> show ?

Usage:
 SHOW          Shows PON information for a specific HW slot.

  [OPTIONAL]
  --slotIdentifies a slot. (not used for LAG)
```

Figure 429. Output of ”show” command in this node context

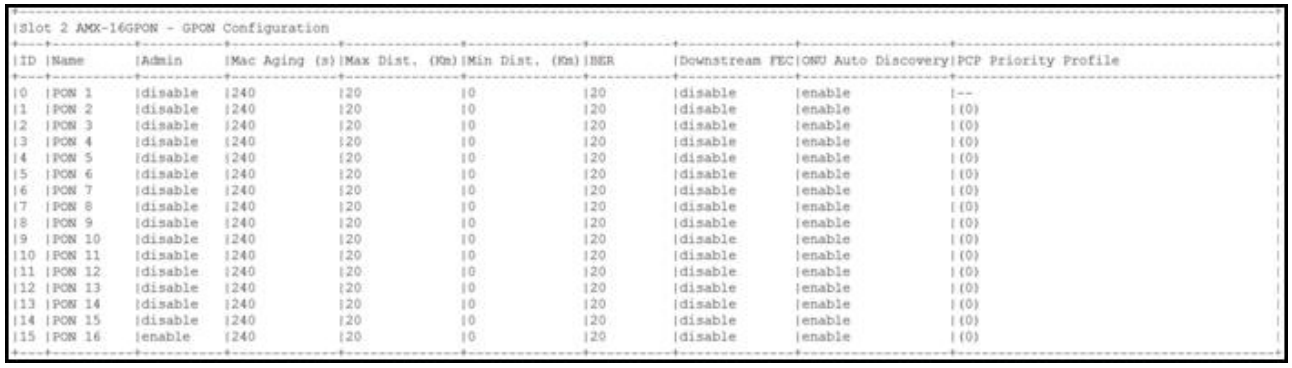
```
/cli/interfaces/gpon> show
+-----------------------------------+
|General Information                |
+----+---------------+---------------+
|Slot|Card Name      |Details        |
+----+---------------+---------------+
|1   |XCO-160        |               |
|2   |AMX-48GE       |               |
|3   |AMX-48GE       |               |
|4   |AMX-48GE       |               |
|6   |FAN            |               |
+----+---------------+---------------+
/cli/interfaces/gpon>
```

Table 339. “show” command output table

Parameter	Description
Slot	Slot number
Card Name	Name of the board inserted in a slot
Details	YES, if there are GPON interfaces in the board and detailed information on the interfaces is available

This command used with arguments provides detailed information on the existing PON interfaces, in the format of a table.

Figure 430. Output of "show" command used with argument --slot, in this node context



```
Slot 2 AMX-16GPON - GPON Configuration
+---+----------+---------+--------------+--------------+--------------+---------+---------------+-----------------+-----------------------------------------------------------------------------+
|ID |Name      |Admin    |Mac Aging (s)|Max Dist. (Km)|Min Dist. (Km)|BER      |Downstream FEC|ONU Auto Discovery|PCP Priority Profile                                                          |
+---+----------+---------+--------------+--------------+--------------+---------+---------------+-----------------+-----------------------------------------------------------------------------+
|0  |PON 1     |disable  |240           |20            |0             |20       |disable        |enable           |--                                                                           |
|1  |PON 2     |disable  |240           |20            |0             |20       |disable        |enable           |(0)                                                                          |
|2  |PON 3     |disable  |240           |20            |0             |20       |disable        |enable           |(0)                                                                          |
|3  |PON 4     |disable  |240           |20            |0             |20       |disable        |enable           |(0)                                                                          |
|4  |PON 5     |disable  |240           |20            |0             |20       |disable        |enable           |(0)                                                                          |
|5  |PON 6     |disable  |240           |20            |0             |20       |disable        |enable           |(0)                                                                          |
|6  |PON 7     |disable  |240           |20            |0             |20       |disable        |enable           |(0)                                                                          |
|7  |PON 8     |disable  |240           |20            |0             |20       |disable        |enable           |(0)                                                                          |
|8  |PON 9     |disable  |240           |20            |0             |20       |disable        |enable           |(0)                                                                          |
|9  |PON 10    |disable  |240           |20            |0             |20       |disable        |enable           |(0)                                                                          |
|10 |PON 11    |disable  |240           |20            |0             |20       |disable        |enable           |(0)                                                                          |
|11 |PON 12    |disable  |240           |20            |0             |20       |disable        |enable           |(0)                                                                          |
|12 |PON 13    |disable  |240           |20            |0             |20       |disable        |enable           |(0)                                                                          |
|13 |PON 14    |disable  |240           |20            |0             |20       |disable        |enable           |(0)                                                                          |
|14 |PON 15    |disable  |240           |20            |0             |20       |disable        |enable           |(0)                                                                          |
|15 |PON 16    |enable   |240           |20            |0             |20       |disable        |enable           |(0)                                                                          |
+---+----------+---------+--------------+--------------+--------------+---------+---------------+-----------------+-----------------------------------------------------------------------------+
```

Table 340. "show" command output used with argument --slot

Parameter	Description
ID	GPON Interface identifier (number)
Name	GPON interface name
Admin	Administrative GPON interface Status (enabled|disabled)
Mac Aging (sec)	Time it takes for a MAC address to be removed from the GPON MAC table, in the case it hasn't been received any packet with that source address in that GPON port. This value must be in the range between 120 and 3600 seconds. (Note: The MAC addresses in the GPON interface are only learnt in Unicast Unstacked Services)
Max distance	Maximum distance for which the interface can detect ONT's. The difference between the minimum and the maximum can't exceed 20km, and the maximum distance can't be higher than 60km
Min. distance	Minimum distance for which the interface can detect ONT's. The difference between the minimum and the maximum can't exceed 20km, and the maximum distance can't be higher than 60km

"showconfig" command

Table 341. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/interfaces/gpon/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 431. CLI on line help on "showconfig" command usage in this node context

```
/cli/interfaces/gpon> showconfig ?

Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

"cos" sub-node

"config" command

Table 342. "config" command information

Name	config
Description	Configure CoS information for PON interfaces.
Full path	/interfaces/gpon/cos/config
Mandatory Parameters	--cos --port --slot
Screen Output	No

Figure 432. CLI on line help on "config" command usage in this node context

```
/cli/interfaces/gpon/cos> config ?

Usage:
  CONFIG         Configure CoS information for PON interfaces.

   <MANDATORY>
   --cos Identifies a Class of Service (1..8)
   --port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
   --slotIdentifies a slot.

   [OPTIONAL]
   --pcp-bitsIdentifies the p-bits associated to the Class of Service. (0..7)
   --profileID     Identifies a profile by ID.
   --scheduler     Identifies the type of Scheduler (strict|weighted)
```

"show" command

This command used without arguments provides information on all the equipment PON interfaces CoS configuration: CoS traffic profile and scheduler policy. When used with the argument slot it displays that information only for the specific slot.

Table 343. "show" command information

Name	show
Description	Show the current CoS configuration.
Full path	/interfaces/gpon/cos/show
Mandatory Parameters	No
Screen Output	Tables Figure 434. Table parameter description in Table 344.

Figure 433. CLI on line help on “show” command usage in this node context

```
/cli/interfaces/gpon/cos> show ?

Usage:
  SHOW          Show the current configuration

  [OPTIONAL]
  --slotIdentifies a slot. (not used for LAG)
```

Figure 434. Partial view of output of ”show” command in this node context

```
+-------------------------------------------------------------------------+
|Card 2 - AMX-16GPON: PON CoS Bit Mapping                                 |
+----------+---+---------------+------------------------------+----------+
|          |   |PCPs           |                              |          |
+----------+---+-+-+-+-+-+-+-+-+------------------------------+----------+
|Port      |CoS|0|1|2|3|4|5|6|7|(ID) Ethernet Profile         |Scheduler |
+----------+---+-+-+-+-+-+-+-+-+------------------------------+----------+
|PON 1     |1  |x| | | | | | | |(0)No Profile                 |strict    |
|          |2  | |x| | | | | | |(0)No Profile                 |strict    |
|          |3  | | |x| | | | | |(0)No Profile                 |strict    |
|          |4  | | | |x| | | | |(0)No Profile                 |strict    |
|          |5  | | | | |x| | | |(0)No Profile                 |strict    |
|          |6  | | | | | |x| | |(0)No Profile                 |strict    |
|          |7  | | | | | | |x| |(0)No Profile                 |strict    |
|          |8  | | | | | | | |x|(0)No Profile                 |strict    |
+----------+---+-+-+-+-+-+-+-+-+------------------------------+----------+
|PON 2     |1  |x| | | | | | | |(0)No Profile                 |strict    |
|          |2  | |x| | | | | | |(0)No Profile                 |strict    |
|          |3  | | |x| | | | | |(0)No Profile                 |strict    |
|          |4  | | | |x| | | | |(0)No Profile                 |strict    |
|          |5  | | | | |x| | | |(0)No Profile                 |strict    |
|          |6  | | | | | |x| | |(0)No Profile                 |strict    |
|          |7  | | | | | | |x| |(0)No Profile                 |strict    |
|          |8  | | | | | | | |x|(0)No Profile                 |strict    |
+----------+---+-+-+-+-+-+-+-+-+------------------------------+----------+
```

Table 344. "show" command output table parameters

Parameter	Description
Port	PON port identification in the board
CoS	Class of Service identification (Number 1..8)
PCPs	p-bit associated to the Class of Service (0..8) marked X
(ID)	Profile ID (number)
Ethernet Profile	Profile Name
Scheduler	Scheduler policy (strict|weighted)

This command used with arguments provides detailed information on the existing PON interfaces, in the format of a table.

"showconfig" command

Table 345. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/interfaces/gpon/cos/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 435. CLI on line help on "showconfig" command usage in this node context

```
/cli/interfaces/gpon/cos> showconfig ?

Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

"statistics" sub-node

"errors" sub-node

"show" command

Table 346. "show" command information

Name	show
Description	Show Error Statistics for a given Gpon Interface
Full path	/interfaces/gpon/statistics/errors/show
Mandatory Parameters	--port --slot

Screen Output	Tables Figure 437. Table parameter description in Table 347

Figure 436. CLI on line help on "show" command usage in this node context

```
/cli/interfaces/gpon/statistics/errors> show ?

Usage:
 SHOW          Show Error Statistics for a given Gpon Interface

  <MANDATORY>
  --port       Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot.
```

Figure 437. Output of "show" command in this node context

```
+-------------------------------------------------------------------------+
|Slot 3 PON 3 - Gpon Errors Statistics                                    |
+----------+-------------------------------+-------------------------------+
|ONU ID    |BIP8                           |REI                            |
+----------+---------------+---------------+---------------+---------------+
|          |Total          |Partial        |Total          |Partial        |
+----------+---------------+---------------+---------------+---------------+
|2         |0              |0              |0              |0              |
|4         |0              |0              |0              |0              |
+----------+---------------+---------------+---------------+---------------+
```

Table 347. "show" command output table parameters

Parameter	Description
ONT ID	ONT identifier (number)
BIP8 (total/partial)	Errors received by the OLT for each of the ONT's(upstream direction); total and partial counter values dispplayed
REI (total/partial)	Errors received by each of the ONTs(downstream direction); total and partial counter values displayed

"ethernet" sub-node

"show" command

Table 348. "show" command information

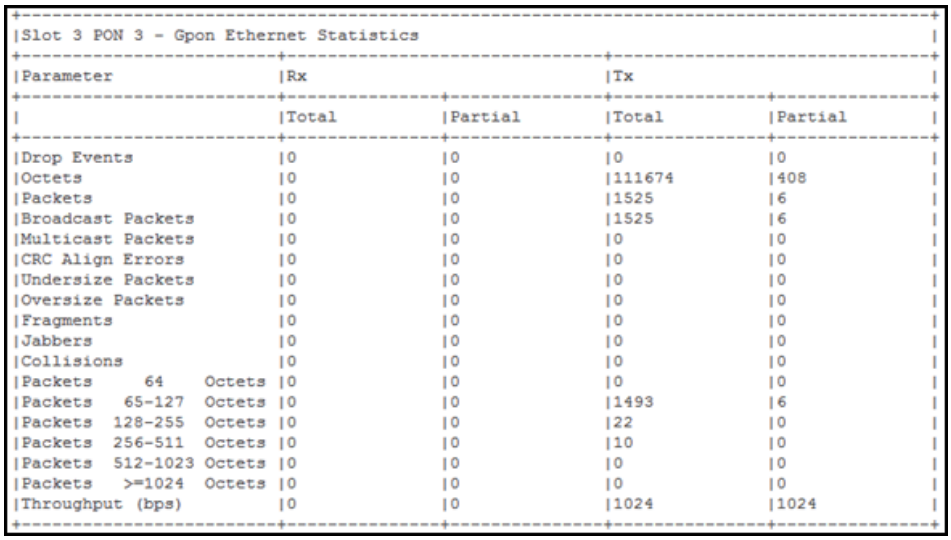
Name	show
Description	Show Ethernet Statistics for a given Gpon Interface
Full path	/interfaces/gpon/statistics/ethernet/show
Mandatory	--port

Parameters	--slot
Screen Output	Tables Figure 439.Table parameter description in Table 349

Figure 438. CLI on line help on "show" command usage in this node context

```
/cli/interfaces/gpon/statistics/ethernet> show ?

Usage:
 SHOW          Show Ethernet Statistics for a given Gpon Interface

  <MANDATORY>
  --port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot.
```

Figure 439. Output of "show" command in this node context



Slot 3 PON 3 - Gpon Ethernet Statistics

Parameter	Rx		Tx	
	Total	Partial	Total	Partial
Drop Events	0	0	0	0
Octets	0	0	111674	408
Packets	0	0	1525	6
Broadcast Packets	0	0	1525	6
Multicast Packets	0	0	0	0
CRC Align Errors	0	0	0	0
Undersize Packets	0	0	0	0
Oversize Packets	0	0	0	0
Fragments	0	0	0	0
Jabbers	0	0	0	0
Collisions	0	0	0	0
Packets 64 Octets	0	0	0	0
Packets 65-127 Octets	0	0	1493	6
Packets 128-255 Octets	0	0	22	0
Packets 256-511 Octets	0	0	10	0
Packets 512-1023 Octets	0	0	0	0
Packets >=1024 Octets	0	0	0	0
Throughput (bps)	0	0	1024	1024

Table 349. "show" command output table parameters

Parameter	Description
Rx Total & Partial	Received total & partial counters
Tx Total & Partial	Transmitted total & partial counters
Drop Events	Number of dropped packets
Octets	Number of bytes
Packets	Number of Packets
Broadcast Packets	Number of Broadcast Packets
Multicast Packets	Number of Multicast Packets
CRC Align Errors	Number of packets with wrong FCS (Frame Check Sequence)
Undersize Packets	Number of packets with size less than 64 bytes

Oversize Packets	Number of packets with size over than 1518 bytes
Fragments	Number of packets with size less than 64 bytes and with wrong FCS (Frame Check Sequence)
Jabbers	Number of packets with size over than 1518 bytes and with wrong FCS (Frame Check Sequence)
Collisions	Number of collisions in the Ethernet Segment (only in Half Duplex)
Buffer Overflows	
Packets 64 Octets	Number of 64 bytes packets
Packets 65-127 Octets	Number of packets with size between 65 to 127 bytes
Packets 128-255 Octets	Number of packets with size between 128 to 255 bytes
Packets 256-511 Octets	Number of packets with size between 256 to 511 bytes
Packets 512-1023 Octets	Number of packets with size between 512 to 1023 bytes
Packets >=1024 Octets	Number of packets with size equal to or higher than 1024 bytes
Throughput (bps)	Indicates approximately the received and transmitted bit rate

"gpon" sub-node

"show" command

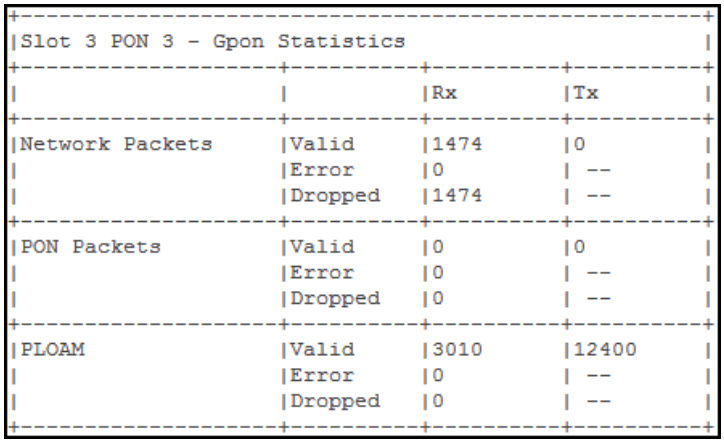
Table 350. "show" command information

Name	show
Description	Show the current CoS configuration.
Full path	/interfaces/gpon/statistics/gpon/show
Mandatory Parameters	--port --slot
Screen Output	Tables Figure 441. Table parameter description in Table 351

Figure 440. CLI on line help on "show" command usage in this node context

```
/cli/interfaces/gpon/statistics/gpon> show ?

Usage:
 SHOW          Show Error Statistics for a given Gpon Interface

  <MANDATORY>
  --port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot.
```

Figure 441. Output of ”show” command in this node context



Slot 3 PON 3 - Gpon Statistics			
		Rx	Tx
Network Packets	Valid	1474	0
	Error	0	--
	Dropped	1474	--
PON Packets	Valid	0	0
	Error	0	--
	Dropped	0	--
PLOAM	Valid	3010	12400
	Error	0	--
	Dropped	0	--

Table 351. “show” command output table parameters

Parameter	Description
Network Packets	In this parameter is possible to check the GPON valid/error/dropped received/transmitted packets from/to the network
PON Packets	In this parameter is possible to check the GPON valid/error/dropped received/transmitted packets from/to the GPON
PLOAM	In this parameter is possible to check the GPON valid/error/dropped received/transmitted PLOAM packets from/to the network

“status” sub-node

“show” command

Table 352. "show" command information

Name	show
Description	Show status information for PON interfaces
Full path	/interfaces/gpon/status/show
Mandatory Parameters	--slot
Screen Output	Table Figure 443. Table parameters description in Table 353

Figure 442. CLI on line help on “show” command usage in this node context

```
/cli/interfaces/gpon/status> show ?
```

Usage:

SHOW Show status information for PON interfaces.

<MANDATORY>

--slotIdentifies a slot.

Figure 443. Output of ”show” command output in this node context

Slot 3 - PON Interfaces Status

Interface	Admin	Fixed (Kbps)	Assured (Kbps)	Maximum (Kbps)	CBR (Kbps)	SFP	Tx (dBm)	Rx Info.	Bias Current (mA)	Temp(C)	Laser	Alarms
PON 1	enable	0	0	0	0	GPON Class B+	3.8	YES	10.0	28	ON	OK
PON 2	enable	0	0	0	0	--	--	--	--	--	FAIL	Not OK
PON 3	enable	0	241152	241152	0	LTE3680M-BH	3.5	YES	16.3	43	ON	OK
PON 4	enable	0	0	0	0	--	--	--	--	--	FAIL	Not OK
PON 5	enable	0	0	0	0	--	--	--	--	--	FAIL	Not OK
PON 6	enable	0	0	0	0	--	--	--	--	--	FAIL	Not OK
PON 7	enable	0	0	0	0	LTE3680M-BH	3.6	YES	17.6	42	ON	OK
PON 8	enable	0	0	0	0	--	--	--	--	--	FAIL	Not OK
PON 9	enable	0	0	0	0	--	--	--	--	--	FAIL	Not OK
PON 10	enable	0	0	0	0	--	--	--	--	--	FAIL	Not OK
PON 11	enable	0	0	0	0	--	--	--	--	--	FAIL	Not OK
PON 12	enable	0	0	0	0	--	--	--	--	--	FAIL	Not OK
PON 13	enable	0	0	0	0	--	--	--	--	--	FAIL	Not OK
PON 14	enable	0	0	0	0	--	--	--	--	--	FAIL	Not OK
PON 15	enable	0	0	0	0	LTE3680M-BH	3.6	YES	17.9	43	ON	OK
PON 16	enable	0	0	0	0	GPON Class B+	3.5	YES	10.1	35	ON	OK

Table 353. “show” command output table parameters

Parameter	Description
Interfaces	GPON interface identifier
Admin	GPON interface administrative state
Fixed (Kbps)	Fixed Bandwidth (must be less than 1,2Gb/s)
Assured(Kbps)	Assured Bandwidth (must be less than 1,2Gb/s)
Maximum(Kbps)	Maximum Bandwidth
CBR(Kbps)	CBR Fixed Bandwidth (must be less than 480Mb/s)
SFP	SFP Module
Tx (dBm)	Indicates the transmitted optical power
Rx(dBm)	Indicates the received optical power
Bias Current(mA)	Indicates the laser BIAS current
Temp.(ºC)	Indicates the SFP module temperature
Laser	Indicates the Laser operational States
Alarms	Indicates the SFP Alarms

“SFPs” sub-node

“show” command

Table 354. "show" command information

Name	show
Description	Show details for an SFP entry from table gpon/status/show
Full path	/interfaces/gpon/status/SFPs/show

Mandatory Parameters	--port --slot
Screen Output	Table, Figure 445.

Figure 444. CLI on line help on "show" command usage in this node context

```
/cli/interfaces/gpon/ status/SFPs>show ?

Usage:
  SHOW          Show details for an SFP entry from table gpon/status/show

  <MANDATORY>
  --port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot.
```

This command displays for the SFPs/XFPs inserted in the specified port, slot, the Base ID fields and the Extended ID fields' information

Figure 445. Output of "show" command in this node context

```
+-------------------------------------------------------------------------------------------------------------------------+
|SFP Info - Slot 3 'PON 1'                                                                                                |
+-------------------------------+-----------------------------------------------------------------------------------------+
|Parameter                      |Value                                                                                    |
+-------------------------------+-----------------------------------------------------------------------------------------+
|Base ID Fields                 |                                                                                         |
|   Identifier                  |SFP                                                                                      |
|   Connector                   |SC                                                                                       |
|   Transceiver                 |0000000000000000h                                                                        |
|   Encoding                    |NRZ                                                                                      |
|   Nominal BitRate  (MBits/s)  |2500                                                                                     |
|   Length (9um)           (Km) |20                                                                                       |
|   Length (9um)            (m) |20000                                                                                    |
|   Length (50um)           (m) |0                                                                                        |
|   Length (62,5um)         (m) |0                                                                                        |
|   Length (Copper)         (m) |0                                                                                        |
|   Vendor Name                 |NEOPHOTONICS                                                                             |
|   Vendor OUI                  |000000                                                                                   |
|   Vendor Serial Number        |PTB38J0-6548E-SC                                                                         |
|   Vendor Revision             |1.0                                                                                      |
|   Laser Wavelength      (nm)  |1490                                                                                     |
+-------------------------------+-----------------------------------------------------------------------------------------+
|Extended ID Fields             |                                                                                         |
|   Options Implemented:        |                                                                                         |
|                               |Loss of Signal Implemented, signal inverted from standard definition in SFP MSA          |
|                               |TX_FAULT signal implemented                                                              |
|                               |TX_DISABLE signal implemented                                                            |
|   Max Baudrate           (%)  |0                                                                                        |
|   Min Baudrate           (%)  |0                                                                                        |
|   Vendor Serial Number        |A0413617874                                                                              |
|   Date Code                   |13/04/09                                                                                 |
|   Lot  Code                   |                                                                                         |
|   Diagnostic Monitoring Type: |                                                                                         |
|                               |Received power measurement type = Average Power                                          |
|                               |Externally Calibrated                                                                    |
|                               |Digital diagnostic monitoring implemented                                                |
|   Enhanced Options:           |                                                                                         |
|                               |Optional Soft TX_FAULT monitoring implemented                                            |
|                               |Optional Soft TX_DISABLE control and monitoring implemented                              |
|                               |Optional Alarm/Warning flags implemented for all monitored quantities                    |
|   SFF-8472 Compliance         |SFF-8472 Rev 9.4                                                                         |
+-------------------------------+-----------------------------------------------------------------------------------------+
|AD Status Bits                 |                                                                                         |
|   Temperature             (C) |28.3                                                                                     |
|   Voltage                 (V) |3.292                                                                                    |
|   Tx Bias                (mA) |9.92                                                                                     |
|   Tx Power               (mW) |0.098                                                                                    |
|   Rx Power               (mW) |0.000000                                                                                 |
|   Op Status                   |00h                                                                                      |
+-------------------------------+-----------------------------------------------------------------------------------------+
```

"rx-power" sub-node

"read-all" command

Table 355. "read-all" command information

Name	read-all
Description	Read rx-power entries for all ONUs on the selected interface.
Full path	/interfaces/gpon/status/rx-power/read-all
Mandatory Parameters	--port --slot
Screen Output	Table, Figure 445.

Figure 446. CLI on line help on "read-all" command usage in this node context

```
/cli/interfaces/gpon> status/rx-power/read-all ?

Usage:
 READ-ALL       Read rx-power entries for all ONUs on the selected interface.

  <MANDATORY>
  --port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot.
```

"show" command

Table 356. "show" command information

Name	show
Description	Show details for a 'Rx-Info.' entry from table gpon/status/show
Full path	/cli/interfaces/gpon/status/rx-power/show
Mandatory Parameters	--port --slot
Screen Output	Table, Figure 448.Table parameters description in Table 357

Figure 447. CLI on line help on "show" command usage in this node context

```
/cli/interfaces/gpon/status/rx-power> show ?

Usage:
 SHOW          Show details for a 'Rx-Info.' entry from table gpon/status/show
```

```
<MANDATORY>
--port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
--slotIdentifies a slot.
```

Figure 448. Output of "show" command in this node context

```
+-----------------------------------------------------+
|RX-Power in Slot 3 PON 3                             |
+-------------------+---------------------------------+
|                   |Last Read                        |
+------+-----------+----------+---------+---------+
|ONU ID|Presence   |Power (dBm)|Date     |Time     |
+------+-----------+----------+---------+---------+
|1     |disconnected|0.0       |21/08/2013|16:22:12 |
|2     |connected   |-14.7     |21/08/2013|17:54:52 |
|3     |disconnected|0.0       |21/08/2013|16:22:12 |
|4     |disconnected|0.0       |21/08/2013|16:30:08 |
+------+-----------+----------+---------+---------+
```

Table 357. "show" command output table parameters

Parameter	Description
ONU ID	ONU identifier
Presence	Indicates if the ONU identified by ONU ID is present (Connected|Disconnected)
Power (dBm)	Optical power received at the specified PON port from each ONU at Date dd/mm/yyy, Time hh:mm:ss
Date	Date of last "read-all" command received Rx-Power from ONU reading; format dd/mm/yyy
Time	Time of last "read-all" command received Rx-Power from ONU reading; format hh:mm:ss

"lag" sub-node

"config" command

Table 358. "config" command information

Name	config
Description	Configure a given LAG interface..
Full path	/interfaces/lag/config
Mandatory Parameters	--lagID
Screen Output	No

Figure 449. CLI on line help on "config" command usage in this node context

```
/cli/interfaces/lag> config ?
```

```
Usage:
 CONFIG        Configure a given LAG interface.

  <MANDATORY>
  --lagID    Identifies a LAG by ID. (0..14)

  [OPTIONAL]
  --admin    Administrative State. Enable/disable, in this context. (enable|disable)
  --balance Traffic Load Balancing of the LAG interface. (SA|DA|SDA)
  --static    Indicates if the LAG is Static (doesnt transmit neither processes LACPDU
   packets) (enable|disable)
```

"create" command

Table 359. "create" command information

Name	create
Description	Create a new LAG entity.
Full path	/interfaces/lag/create
Mandatory Parameters	This command has no parameters
Screen Output	No

Figure 450. CLI on line help on "create" command usage in this node context

```
/cli/interfaces/lag> create ?

Usage:
 CREATE Create a new LAG entity.
```

"remove" command

Table 360. "remove" command information

Name	remove
Description	Remove an existing LAG.
Full path	/interfaces/lag/remove
Mandatory Parameters	--lagID
Screen Output	No

Figure 451. CLI on line help on “remove” command usage in this node context

```
/cli/interfaces/lag> remove ?

Usage:
 REMOVE        Remove an existing LAG.

  <MANDATORY>
  --lagID    Identifies a LAG by ID. (0..14)
```

“show” command

Table 361. "show" command information

Name	show
Description	Shows the current LAGs configured. If a LAG ID is given shows information for that LAG only.
Full path	/interfaces/lag/show
Mandatory Parameters	No
Screen Output	Tables Figure 342.Tables parameter description Table 258

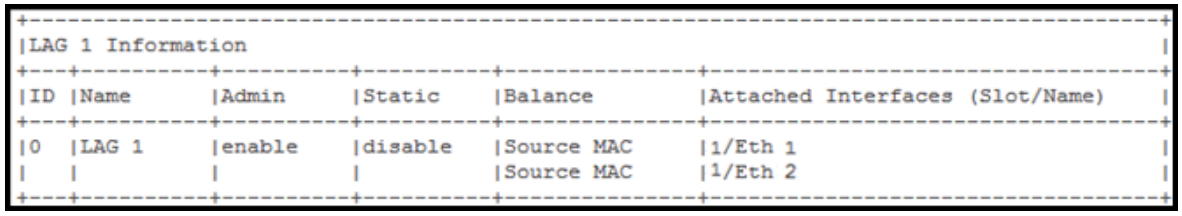
Figure 452. CLI on line help on “show” command usage in this node context

```
/cli/interfaces/lag> show ?

Usage:
 SHOW          Shows the current LAGs configured. If a LAG ID is given shows
information for that LAG only.

  [OPTIONAL]
  --lagID    Identifies a LAG by ID. (0..14)
```

Figure 453. Output of ”show” command in this node context”

```
/cli/interfaces/lag> show
+-------------------------------------------------------------------------------------------------------------------------+
|Configured LAGs Information                                                                                              |
+---+----------+----------+----------+--------------+-------------------------------------------------------------------+
|ID |Name      |Admin     |Static    |Balance       |Attached Interfaces (Slot/Name)                                    |
+---+----------+----------+----------+--------------+-------------------------------------------------------------------+
+---+----------+----------+----------+--------------+-------------------------------------------------------------------+
/cli/interfaces/lag>
```

Figure 454. Output of ”show” command with argument --lagID in this node context”



```
+-------------------------------------------------------------------------------+
|LAG 1 Information                                                              |
+---+---------+---------+---------+--------------+-----------------------------+
|ID |Name     |Admin    |Static   |Balance       |Attached Interfaces (Slot/Name)|
+---+---------+---------+---------+--------------+-----------------------------+
|0  |LAG 1    |enable   |disable  |Source MAC    |1/Eth 1                      |
|   |         |         |         |Source MAC    |1/Eth 2                      |
+---+---------+---------+---------+--------------+-----------------------------+
```

Table 362. “show” command output table parameters

Parameter	Description
ID	LAG Identifier(number)
Name	LAG Interface name
Admin	LAG administrative State (enable|disable)
Static	Indicates if the LAG is Static (enable|disable)
Balance	Indicates type of traffic Load Balancing of the LAG interface (Source MAC | Destination MAC | Source and Destination MAC)
Attached Interfaces (Slot/Name)	Indicates the Ports that belong to the LAG identified by slot/port pair

“showconfig” command

Table 363. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/interfaces/lag/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 455. CLI on line help on “showconfig” command usage in this node context

```
/cli/interfaces/lag> showconfig ?

Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

"cos" sub-node

"config" command

Table 364. "config" command information

Name	config
Description	Configure CoS information for LAG interfaces.
Full path	/interfaces/lag/cos/config
Mandatory Parameters	--cos --port
Screen Output	No

Figure 456. CLI on line help on "config" command usage in this node context

```
/cli/interfaces/lag/cos> config ?
Usage:
 CONFIG        Configure CoS information for LAG interfaces.

  <MANDATORY>
  --cos Identifies a Class of Service (1..8)
  --port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)

  [OPTIONAL]
  --pcp-bitsIdentifies the p-bits associated to the Class of Service. (0..7)
  --profileID     Identifies a profile by ID.
  --scheduler     Identifies the type of Scheduler (strict|weighted)
```

"show" command

This command used without arguments provides information on all the equipment PON interfaces CoS configuration: CoS traffic profile and scheduler policy. When used with the argument slot it displays that information only for the specific slot.

Table 365. "show" command information

Name	show
Description	Show the current configuration.
Full path	/interfaces/lag/cos/show
Mandatory Parameters	No

Screen Output	Table Figure 458. Table parameter description in Table 366.

Figure 457. CLI on line help on "show" command usage in this node context

```
/cli/interfaces/lag/cos> show ?

Usage:
 SHOW          Show the current configuration

  [OPTIONAL]
  --lagID    Identifies a LAG by ID. (0..14)
```

Figure 458. Output of "show" command in this node context

```
+-------------------------------------------------------------------------+
|LAG CoS Bit Mapping                                                      |
+----------+---+---------------+-----------------------------+----------+
|          |   |PCPs           |                             |          |
+----------+---+-+-+-+-+-+-+-+-+-----------------------------+----------+
|Port      |CoS|0|1|2|3|4|5|6|7|(ID) Ethernet Profile        |Scheduler |
+----------+---+-+-+-+-+-+-+-+-+-----------------------------+----------+
|LAG 1     |1  |x| | | | | | | |(0)No Profile                |strict    |
|          |2  | |x| | | | | | |(0)No Profile                |strict    |
|          |3  | | |x| | | | | |(0)No Profile                |strict    |
|          |4  | | | |x| | | | |(0)No Profile                |strict    |
|          |5  | | | | |x| | | |(0)No Profile                |strict    |
|          |6  | | | | | |x| | |(0)No Profile                |strict    |
|          |7  | | | | | | |x| |(0)No Profile                |strict    |
|          |8  | | | | | | | |x|(0)No Profile                |strict    |
+----------+---+-+-+-+-+-+-+-+-+-----------------------------+----------+
```

Table 366. "show" command output table parameters

Parameter	Description
Port	LAG port identification
CoS	Class of Service identification (Number 1..8)
PCPs	p-bit associated to the Class of Service (0..8) marked X
(ID)	Profile ID (number)
Ethernet Profile	Profile Name
Scheduler	Scheduler policy (strict|weighted)

"showconfig" command

Table 367. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/interfaces/lag/cos/showconfig

Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 459. CLI on line help on "showconfig" command usage in this node context

```
/cli/interfaces/lag/cos> showconfig ?

Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

"mapping" sub-node

"attach" command

Table 368. "attach" command information

Name	attach
Description	Add the specified interface by 'slot,port' to the given LAG ID.
Full path	/interfaces/lag/mapping/attach
Mandatory Parameters	--lagID --port --slot
Screen Output	No

Figure 460. CLI on line help on "attach" command usage in this node context

```
/cli/interfaces/lag/mapping> attach ?

Usage:
  ATTACH        Add the specified interface by 'slot,port' to the given LAG ID.

  <MANDATORY>
  --lagID    Identifies a LAG by ID. (0..14)
  --port     Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot.
```

"availableValues" command

Table 369. "availableValues" command information

Name	availableValues

Description	Display the interfaces that can be used to attach/detach.
Full path	/interfaces/lag/mapping/availableValues
Mandatory Parameters	This command has no parameters
Screen Output	TableFigure 462 . Table parameters description in Table 370.

Figure 461. CLI on line help on "availableValues" command usage in this node context

```
/cli/interfaces/lag/mapping> availableValues ?


Usage:
  AVAILABLEVALUES    Display the interfaces that can be used to attach/detach
```

Figure 462. Output of "availableValues" command in this node context

```
/cli/interfaces/lag/mapping> availableValues
+---------------------------------------+
|Available interfaces for Attach        |
+-----+---------------------------------+
|Slot |Interface                        |
+-----+---------------------------------+
|1    |Eth 2                            |
|2    |Eth 1                            |
|2    |Eth 2                            |
|2    |Eth 3                            |
|2    |Eth 4                            |
|2    |Eth 5                            |
|2    |Eth 6                            |
```

Table 370. "availableValues" command output table parameters

Parameter	Description
Slot	Slot identifier
Interface	Ethernet interface Identifier

"detach" command

Table 371. "detach" command information

Name	detach
Description	Remove the specified interface by 'slot,port' from the given LAG ID.
Full path	/interfaces/lag/mapping/detach
Mandatory Parameters	--lagID --port --slot
Screen Output	No

Figure 463. CLI on line help on “detach” command usage in this node context

```
/cli/interfaces/lag/mapping> detach ?

Usage:
 DETACH        Remove the specified interface by 'slot,port' from the given LAG ID.

  <MANDATORY>
  --lagID    Identifies a LAG by ID. (0..14)
  --port     Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot.
```

“statistics” sub-node

“show” command

Table 372. "show" command information

Name	show
Description	Show the statistics information for LAG ports.
Full path	/interfaces/lag/statistics/show
Mandatory Parameters	This command has no parameters.
Screen Output	Table, Figure 465. Table parameters description in Table 373 .

Figure 464. CLI on line help on “show” command usage in this node context

```
/cli/interfaces/lag/statistics> show ?

Usage:
 SHOW          Show
```

Figure 465. Output of ”show” command in this node context

```
+-------------------------------------------------------------------+
|LAG Statistics                                                     |
+-----+-----+----------+--------------------+--------------------+
|LAG  |Slot |Port      |Rx                  |Tx                  |
+-----+-----+----------+--------------------+--------------------+
|LAG 1|1    |Eth 1     |0                   |31                  |
|     |1    |Eth 2     |0                   |31                  |
+-----+-----+----------+--------------------+--------------------+
```

Table 373. "show" command output table parameters

Parameter	Description
LAG	Indicates the LAG Identifier
Slot	Identifies the slot to where the card to which the Ethernet Port belongs is inserted
Port	Indicates the Ethernet Ports that belong to the LAG.
Rx	Indicates the number of LACPDUs received
Tx	Indicates the number of LACPDUs transmitted

"status" sub-node

"show" command

Table 374. "show" command information

Name	show
Description	Show the status information for the LAG interfaces.
Full path	/interfaces/lag/status/show
Mandatory Parameters	This command has no parameters.
Screen Output	Table, Figure 467. Table parameters description in Table 375.

Figure 466. CLI on line help on "show" command usage in this node context

```
/cli/interfaces/lag/status> show ?

Usage:
  SHOW          Show status information for LAG interfaces.
```

Figure 467. Output of "show" command in this node context

```
+-------------------------------------------------------------------------------+
|LAG Status                                                                     |
+-------------------------------------------------+-----------------------------+
|                                                 |Underlying Interfaces        |
+---+----------+-----------+------------+---------+--------------+-------------+
|ID |Name      |Admin      |Link Status |Channel Type|Slot/Port     |Status       |
+---+----------+-----------+------------+---------+--------------+-------------+
|0  |LAG 1     |enable     |Down        |Dynamic  |1/Eth 1       |Inactive     |
|   |          |           |            |         |1/Eth 2       |Inactive     |
+---+----------+-----------+------------+---------+--------------+-------------+
```

Table 375. "show" command output table parameters

Parameter	Description
ID	Indicates the LAG Identifier (number)
Name	Indicates the LAG Name

Admin	Indicates the LAG Administrative State.
Link Status	If at least one of the LAG members is up, the status is Up, otherwise is Down
Channel Type	Indicates if the LAG is Static, in this case it doesn't process or send LACPDUs, or it's Dynamic, in this case it processes and send's LACPDUs
Slot/port	Indicates the Ethernet Ports (identified by the pair slot/port) that belong to the LAG
Status	Indicates if the status of the ports in the LAG (Active | Inactive)

"rf-overlay" sub-node

"config" command

Table 376. "config" command information

Name	config
Description	Configure an RF interface.
Full path	/interfaces/rf-overlay/config
Mandatory Parameters	--slot
Screen Output	No

Figure 468. CLI on line help on "config" command usage in this node context

```
/cli/interfaces/rf-overlay> config ?

Usage:
 CONFIG        Configure an RF interface.

  <MANDATORY>
  --slotIdentifies a slot.

  [OPTIONAL]
  --admin   Administrative State. Enable/disable, in this context. (enable|disable)
  --in-pwr-max  Set the maximum input power to signal and send an alarm (dBm)
  --in-pwr-min  Set the minimum input power to signal and send an alarm (dBm)
  --out-pwr-max      Set the maximum output power to signal and send an alarm (dBm)
  --out-pwr-min      Set the minimum output power to signal and send an alarm (dBm)
  --temp-max    Set the maximum temperature to signal and send an alarm (C)
  --temp-min    Set the minimum temperature to signal and send an alarm (C)
```

“show” command

Table 377. "show" command information

Name	show
Description	Show the current RF configuration.
Full path	/interfaces/rf-overlay/show
Mandatory Parameters	No
Screen Output	Tables Figure 470. Table parameters description inTable 378

Figure 469. CLI on line help on “show” command usage in this node context

```
/cli/interfaces/rf-overlay> show ?

Usage:
  SHOW          Show the current RF configuration.
```

Figure 470. Output of ”show” command in this node context

```
/cli/interfaces/rf-overlay> show
+-------------------------------------------------------------------------------------------------------------------------------------------------------+
|RF Overlay Power Information                                                                                                                           |
+-------------------------------------------------------------------+-------------------+-------------------+-------------------+
|                                                                   |Input Pwr Alarm(dBm) |Output Pwr Alarm(dBm)|Temperature (C)      |
+-----+---------------+----------+----------+-------------------+----------+----------+----------+----------+----------+----------+
|Slot |Name           |RF Admin  |Safe Mode |Output Power (dBm) |Lower     |Higher    |Lower     |Higher    |Lower     |Higher    |
+-----+---------------+----------+----------+-------------------+----------+----------+----------+----------+----------+----------+
+-----+---------------+----------+----------+-------------------+----------+----------+----------+----------+----------+----------+
/cli/interfaces/rf-overlay>
```

Table 378. “show” command output table parameters

Parameter	Description
Slot	Slot number
Card Name	Name of the board inserted in a slot
RF Admin	Administrative status of the RF overlay card
Input Power (dBm) (Lower/Higher)	RF-overlay input power levels in dBm
Output Power (dBm) (Lower/Higher)	RF-overlay output power levels in dBm
Temerature (C) (Lower/Higher)	Card temperature value in ºC

“showconfig” command

Table 379. "showconfig" command information

Name	showconfig

Description	Print the command list that enforces the current configuration
Full path	/interfaces/rf-overlay/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 471. CLI on line help on "showconfig" command usage in this node context

```
/cli/interfaces/rf-overlay> showconfig ?

Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

"status" sub-node

"show" command

Table 380. "show" command information

Name	show
Description	Show the current RF overlay status information.
Full path	/interfaces/rf-overlay/status/show
Mandatory Parameters	This command has no parameters.
Screen Output	Table, Figure 473. Table parameters description in Table 381

Figure 472. CLI on line help on "show" command usage in this node context

```
/cli/interfaces/rf-overlay/status> show ?

Usage:
  SHOW          Show the current RF overlay status information.
```

Figure 473. Output of "show" command in this node context

```
/cli/interfaces/rf-overlay/status> show
+-------------------------------------------------------------------------------------------------------------+
|RF Overlay Status                                                                                            |
+-----+--------------------+-----------------------+-----------------------+-----------------------+----------+
|     |                    |Rx                     |Tx                     |Temperature            |          |
+-----+--------------------+---------------+-------+---------------+-------+---------------+-------+----------+
|Slot |Name                |Power (dbm)    |Alarm  |Power (dbm)    |Alarm  | (C)           |Alarm  |
+-----+--------------------+---------------+-------+---------------+-------+---------------+-------+----------+
+-----+--------------------+---------------+-------+---------------+-------+---------------+-------+----------+
/cli/interfaces/rf-overlay/status>
```

Table 381. "show" command output table parameters

Parameter	Description
Slot	Slot number
Name	Name of the board inserted in the slot
Rx Power (dBm)	RF-overlay received power level in dBm
Rx Alarm	Rx alarm identification
Tx Power (dBm)	RF-overlay transmitted power level in dBm
Tx Alarm	Tx alarm identification
Temperature (C)	Card temperature value in ºC
Temperature Alarm	Temperature alarm identification

"ip" node

Figure 474.ip node tree

```
/cli/ip> tree
+ ip[@apply, @save]
  + interfaces[]
    + inband[@config, @show, @showconfig]
    + ip[@config, @show, @showconfig]
  + networking[@config, @show, @showconfig]
  + route[@create, @remove, @show, @showconfig]
```

"apply" command

Table 382. "apply" command information

Name	applyt
Description	Will apply to the HW the last saved IP configuration.
Full path	/ip/apply
Mandatory Parameters	This command has no parameters.
Screen Output	No

Figure 475. CLI on line help on "apply" command usage in this node context

```
/cli/ip> apply ?

Usage:
  APPLY                 Will apply to the HW the last saved IP configuration.
```

“save” command

Table 383. "save" command information

Name	save
Description	Save the current IP configuration to the system startup configuration.
Full path	/ip/save
Mandatory Parameters	This command has no parameters.
Screen Output	No

Figure 476. CLI on line help on “save” command usage in this node context

```
/cli/ip> save ?

Usage:
  SAVE                Save the current IP configuration to the system startup configuration.
```

“interfaces” sub-node

“inband” sub-node

“config” command

Table 384. "config" command information

Name	config
Description	Configure an Inband interface.
Full path	/ip/interfaces/inband/config
Mandatory Parameters	--slot --set-InBand
Screen Output	No

Figure 477. CLI on line help on “config” command usage in this node context

```
/cli/ip/interfaces/inband> config ?

Usage:
  CONFIG        Configure

  <MANDATORY>
```

```
--port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
--set-InBand  Set the given interface for inBand mgmt or not. (true/false)

[OPTIONAL]
--slotIdentifies a slot. (not used for LAG)
```

"show" command

This command displays general information on the system configuration, indicating the interfaces available in the system for inBand configuration and showing current InBand configuration.

Table 385. "show" command information

Name	show
Description	Show the current configuration.
Full path	/ip/interfaces/inband/show
Mandatory Parameters	This command has no parameters
Screen Output	Tables Figure 479. Table parameters description inTable 386

Figure 478. CLI on line help on "show" command usage in this node context

```
/cli/ip/interfaces/inband> show ?

Usage:
 SHOW        Show the current configuration
```

Figure 479. Output of "show" command in this node context

```
/cli/ip/interfaces/inband> show
+---------------------------------+
|InBand Interfaces                |
+-----+---------------+-----------+
|Slot |Port           |InBand     |
+-----+---------------+-----------+
|1    |Eth 1          |--         |
|1    |Eth 2          |--         |
+-----+---------------+-----------+
/cli/ip/interfaces/inband>
```

Table 386. "show" command output table parameters

Parameter	Description
Slot	Slot number of the uplink interface (not applicable for LAG)
Port	Interface (or LAG)
InBand	Indicates if the interface is used or not to manage the

	system; YES if in use.

"showconfig" command

Table 387. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/ip/interfaces/inband/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 480. CLI on line help on "showconfig" command usage in this node context

```
/cli//ip/interfaces/inband > showconfig ?

Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

"ip" sub-node

"config" command

This command configures the ethernet and inBand management interfaces

Table 388. "config" command information

Name	config
Description	Configure the ethernet and inBand management interfaces
Full path	/ip/interfaces/ip/config
Mandatory Parameters	--ID
Screen Output	No

Figure 481. CLI on line help on "config" command usage in this node context

```
/cli/ip/interfaces/ip> config ?

Usage:
  CONFIG        Configure
```

<MANDATORY>
--ID Identifies a table entry by ID, in this context.

[OPTIONAL]
--admin Administrative State. Enable/disable, in this context. (enable|disable)
--ip-address IPv4 address
--mask-bits IPv4 Subnet Mask bits (0..32)
--vlan Choose a VLAN ID.

"show" command

This command displays general information on the system configuration, indicating the interfaces available in the system for inBand configuration and showing current InBand configuration.

Table 389. "show" command information

Name	show
Description	Show the current configuration.
Full path	/ip/interfaces/ip/show
Mandatory Parameters	This command has no parameters
Screen Output	Table Figure 483. Table parameters description in Table 390

Figure 482. CLI on line help on "show" command usage in this node context

```
/cli/ip/interfaces/ip> show ?

Usage:
  SHOW          Show the current configuration
```

Figure 483. Output of "show" command in this node context

```
/cli/ip/interfaces/ip> show
+-------------------------------------------------------------------------------------------+
|IP Interfaces                                                                              |
+---+------------------------------+----------+--------------------+----------+----------+
|ID |Name                          |Admin     |Address             |Mask Bits |Mgmt VLAN |
+---+------------------------------+----------+--------------------+----------+----------+
|0  |eth1                          |enable    |10.112.105.25       |16        |--        |
|1  |InBand                        |disable   |0.0.0.0             |24        |0         |
+---+------------------------------+----------+--------------------+----------+----------+
/cli/ip/interfaces/ip>
```

Table 390. "show" command output table parameters

Parameter	Description
ID	Interface identifier (number)
Name	Interface name
Admin	Administrative state of the interface
Address	IP address of the interface
Mask Bits	Network mask of the Interface
Mgmt Vlan	VLAN identifier used in the inBand interface

"showconfig" command

Table 391. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/ip/interfaces/ip/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 484. CLI on line help on "showconfig" command usage in this node context

```
/cli//ip/interfaces/inband > showconfig ?

Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

"networking" sub-node

"config" command

This command configures the ethernet and inBand management interfaces

Table 392. "config" command information

Name	config
Description	Configures the current management interface.
Full path	/ip/networking/config
Mandatory Parameters	No
Screen Output	No

Figure 485. CLI on line help on "config" command usage in this node context

```
/cli/ip/networking> config ?

Usage:
  CONFIG          Configure
```

```
[OPTIONAL]
--mgmt-interface   Choose the management interface to use.
```

“show” command

This command displays general information on the system configuration, indicating the interfaces available in the system for inBand configuration and showing current InBand configuration.

Table 393. "show" command information

Name	show
Description	Show the current configuration.
Full path	/ip/networking/show
Mandatory Parameters	This command has no parameters
Screen Output	Table Figure 487. Table parameters description in Table 394

Figure 486. CLI on line help on “show” command usage in this node context

```
/cli/ip/interfaces/ip> show ?

Usage:
  SHOW          Show the current configuration
```

Figure 487. Output of ”show” command in this node context

```
+-----------------------------------------------------+
|Networking                                           |
+--------------------+--------------------------------+
|Parameter           |Value                           |
+--------------------+--------------------------------+
|mgmt-interface      |eth1                            |
+--------------------+--------------------------------+
```

Table 394. “show” command output table parameters

Parameter	Description
Parameter	Indentification of the networking parameter, eg management interface (mgmt-interface)
Value	Parameter value, eg eth1 for the current management interface

“showconfig” command

Table 395. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/ip/networking/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 488. CLI on line help on “showconfig” command usage in this node context

```
/cli//ip/networking> showconfig ?

Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

“route” sub-node

This sub-node allows the creation and configure of an IP route to reach the manager entity, if necessary.

“create” command

This command creates an IP route. There can only be one IP route.

Table 396. "create" command information

Name	create
Description	Creates an IP route
Full path	/ip/route/create
Mandatory Parameters	--gw-ip
Screen Output	No

Figure 489. CLI on line help on “create” command usage in this node context

```
/cli/ip/route> create ?

Usage:
  CREATE          Create
```

```
<MANDATORY>
--gw-ip    Gateway to the configured network
```

“remove” command

This command deletes the IP route. There can only be one IP route.

Table 397. "remove" command information

Name	remove
Description	Deletes the current IP route.
Full path	/ip/route/remove
Mandatory Parameters	No
Screen Output	No

Figure 490. CLI on line help on “remove” command usage in this node context

```
/cli/ip/route> remove ?

Usage:
 REMOVE        Remove
```

“show” command

This command displays general information on the system configuration, indicating the interfaces available in the system for inBand configuration and showing current InBand configuration.

Table 398. "show" command information

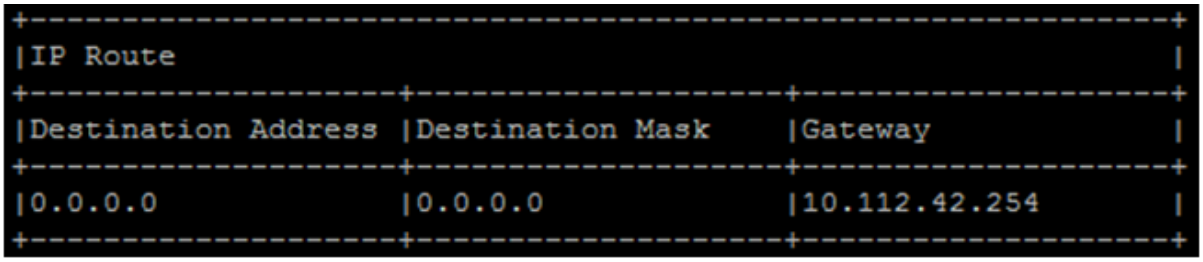
Name	show
Description	Show the current configuration.
Full path	/ip/route/show
Mandatory Parameters	This command has no parameters
Screen Output	Table Figure 492. Table parameters description in Table 399

Figure 491. CLI on line help on “show” command usage in this node context

```
/cli/ip/route> show ?

Usage:
```

```
SHOW          Show the current configuration
```

Figure 492. Output of ”show” command in this node context



```
+-----------------------------------------------------------------+
|IP Route                                                         |
+--------------------+--------------------+--------------------+
|Destination Address |Destination Mask    |Gateway             |
+--------------------+--------------------+--------------------+
|0.0.0.0             |0.0.0.0             |10.112.42.254       |
+--------------------+--------------------+--------------------+
```

Table 399. “show” command output table parameters

Parameter	Description
Destination Address	IPv4 network destination address
Destination Mask	IPv4 network destination mask
Gateway	IPv4 network destination gateway

“showconfig” command

Table 400. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/ip/route/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 493. CLI on line help on “showconfig” command usage in this node context

```
/cli//ip/networking> showconfig ?


Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

“logs” node

This node is used to view logs for all the system events.

Figure 494. logs node tree

```
/cli/logs> tree
+ logs[]
  + alarms[@clear, @show]
```

“alarms” sub-node

This sub-node allows the creation and configure of an IP route to reach the manager entity, if necessary.

“clear” command

Table 401. "clear" command information

Name	clear
Description	Clear all alarms for a given slot or all alarms for all slots.
Full path	/ip/logs/alarms/clear
Mandatory Parameters	No
Screen Output	No

Figure 495. CLI on line help on “clear” command usage in this node context

```
/cli/logs/alarms> clear ?

Usage:
 CLEAR        Clear all alarms for a given slot or all alarms for all slots.

  [OPTIONAL]
  --slotIdentifies a slot. (not used for LAG)
```

"show" command

This command displays the registered alarms: global alarms if the command is used without arguments or slot specific alarms if the command is used with argument slot.

Table 402. "show" command information

Name	show
Description	Show registered alarms (Global or slot specific).
Full path	/ip/logs/alarms/show
Mandatory Parameters	No
Screen Output	Tables Figure 497 and Figure 498. Tables parameters description in Table 403

Figure 496. CLI on line help on "show" command usage in this node context

```
/cli/logs/alarms> show ?

Usage:
  SHOW          Show registered alarms (Global or slot specific).

  [OPTIONAL]
  --slotIdentifies a slot. (not used for LAG)
```

Figure 497. Output of "show" command used with no argument in this node context – Global alarm list

```
/cli/logs> alarms/show
+-------------------------------------------------------------------------------------------------------------------
|Alarms List  -- Page (1)
+----------+----------+-----------+----------+----------+-----------------------------------------------------
|Equipment |Index     |Date       |Hour      |Code      |Description
+----------+----------+-----------+----------+----------+-----------------------------------------------------
|OLT       | --       |2014/06/16 |16:09:05  |16        |The system was rebooted.
|OLT       | --       |2014/06/16 |16:09:24  |110042    |Slot mode configuration successful (slot 02)
|OLT       | --       |2014/06/16 |16:09:24  |110042    |Slot mode configuration successful (slot 03)
|OLT       | --       |2014/06/16 |16:09:24  |110042    |Slot mode configuration successful (slot 04)
|OLT       | --       |2014/06/16 |16:10:09  |609       |Begin Protection Switch Fabric configuration error
|OLT       | --       |2014/06/16 |16:15:07  |609       |End Protection Switch Fabric configuration error
|OLT       | --       |2014/06/16 |16:15:29  |609       |Begin Protection Switch Fabric configuration error
|OLT       | --       |2014/06/16 |16:18:06  |609       |End Protection Switch Fabric configuration error
|OLT       | --       |2014/06/16 |16:18:13  |110030    |Module insertion XCO-160 in slot 5.
|OLT       | --       |2014/06/16 |16:18:16  |609       |Begin Protection Switch Fabric configuration error
+----------+----------+-----------+----------+----------+-----------------------------------------------------
```

Figure 498. Partial view of ”show” command with argument –slot output in this node context

```
|Alarms List  -- Page (5)
|Equipment |Index     |Date       |Hour       |Code       |Description
|OLT 3.2   | --       |2013/08/22 |12:09:50   |119        |End Loss of frame
|OLT 3.2   | --       |2013/08/22 |12:09:50   |120        |End Loss of PLOAM
|ONU 3.2   |Eth 1     |2013/08/22 |12:09:52   |36866      |Begin Eth link down
|OLT 3.2   | --       |2013/08/22 |12:09:52   |118        |Begin Loss of signal
|OLT 3.2   | --       |2013/08/22 |12:09:52   |119        |Begin Loss of frame
|OLT 3.2   | --       |2013/08/22 |12:09:52   |120        |Begin Loss of PLOAM
|ONU 3.2   |Eth 1     |2013/08/22 |12:10:10   |36866      |End Eth link down
|OLT 3.2   | --       |2013/08/22 |12:10:10   |126        |Begin Start-up Failure
|OLT 3.2   | --       |2013/08/22 |12:10:30   |126        |End Start-up Failure
|OLT 3.2   | --       |2013/08/22 |12:10:30   |118        |End Loss of signal
|OLT 3.2   | --       |2013/08/22 |12:10:30   |119        |End Loss of frame
|OLT 3.2   | --       |2013/08/22 |12:10:30   |120        |End Loss of PLOAM
|ONU 3.2   |Eth 1     |2013/08/22 |12:10:31   |36866      |Begin Eth link down
|ONU 3.2   | --       |2013/08/22 |12:10:32   |110001     |ONU connection established
|ONU 3.2   |Eth 1     |2013/08/22 |12:10:38   |36866      |End Eth link down
```

Table 403. “show” command output table parameters

Parameter	Description
Table Title	Alarms List – Page (#) page number if more than one page with registered alarms to display
Equipment	Alarm or event source (equipment)
Index	Alarm or event source (port if applicable)
Date and hour	Date and hour when the alarm or event occurred
Code	Alarm Code
Description	Alarm or event description

“mac-table” node

Figure 499.”mac-table” node tree

```
/cli/mac-table> tree
+ mac-table[@config, @show, @showconfig]
  + status[]
    + gpon[@remove, @show]
    + switch[@remove, @show]
```

“config” command

This command configures the ethernet and inBand management interfaces

Table 404. "config" command information

Name	config
Description	Configures the mac-table switch parameters.
Full path	/mac-table/config
Mandatory Parameters	--mac-aging
Screen Output	No

Figure 500. CLI on line help on “config” command usage in this node context

```
/cli/mac-table> config ?

Usage:
 CONFIG        Configure

  <MANDATORY>
  --mac-aging   Define the MAC aging time in seconds (10..1000000)
```

“show” command

This command displays the Aging Time which defines the maximum time each MAC address can be at the MAC table when no packet with that MAC address arrives to the system..

Table 405. "show" command information

Name	show
Description	Show the current configuration.
Full path	/mac-table/show
Mandatory Parameters	This command has no parameters
Screen Output	Table Figure 502. Table parameters description in Table 406

Figure 501. CLI on line help on "show" command usage in this node context

```
/cli/mac-table> show ?

Usage:
  SHOW          Show the current configuration
```

Figure 502. Output of "show" command in this node context

```
+------------------------------+
|Global MAC Aging (seconds)    |
+------------------------------+
|300                           |
+------------------------------+
```

Table 406. "show" command output table parameters

Parameter	Description
Global Mac Aging (seconds)	Currently configured value for the maximum time each MAC address can be at the MAC table when no packet with that MAC address arrives to the system

"showconfig" command

Table 407. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/mac-aging/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 503. CLI on line help on "showconfig" command usage in this node context

```
/cli//ip/networking> showconfig ?

Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

“status” sub-node

“gpon” sub-node

“remove” command

Table 408. "remove" command information

Name	remove
Description	Remove one GPON MAC entry from the Table. All parameters are mandatory except when shown "--".
Full path	/mac-table/status/gpon/remove
Mandatory Parameters	--mac --onuID --port --serviceID --slot
Screen Output	No

Figure 504. CLI on line help on “remove” command usage in this node context

```
/cli/mac-table/status/gpon> remove ?

Usage:
 REMOVE          Remove one Switch MAC entry from the Table. All parameters are
mandatory except when shown "--".

  <MANDATORY>
  --mac      Identify/Set a MAC entry, in this context.
  --onuID    Identifies an ONU by ID, in this context.
  --port     Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --serviceID     Select an OLT service by ID.
  --slotIdentifies a slot.
```

“show” command

Table 409. "show" command information

Name	show
Description	Show the GPON MAC Table.
Full path	/mac-table/status/gpon/show
Mandatory Parameters	No
Screen Output	Table Figure 506. Table parameters description in Table 410

Figure 505. CLI on line help on “show” command usage in this node context

```
/cli/mac-table/status/gpon> show ?

Usage:
 SHOW          Show the GPON MAC Table.

  [OPTIONAL]
  --port       Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot. (not used for LAG)
```

Figure 506. Output of ”show” command in this node context

```
+-------------------------------------------------------------------------------+
|GPON MAC Table                                                                 |
+-----+-------+------+-----------------------------------------+-----------------+
|Slot |Port   |ONU ID|(ID) OLT Service                         |MAC              |
+-----+-------+------+-----------------------------------------+-----------------+
+-----+-------+------+-----------------------------------------+-----------------+
```

Table 410. “show” command output table parameters

Parameter	Description
Slot	Indicates the Slot
Port	Indicates the Port
ONU ID	Indicates the ONU identifier
(ID) OLT Service	Indicates the service identifier (ID) and name
MAC	Indicates the learned MAC address

“switch” sub-node

“remove” command

Table 411. "remove" command information

Name	remove
Description	Remove one Switch MAC entry from the Table. All parameters are mandatory except when shown "--".
Full path	/mac-table/status/switch/remove
Mandatory Parameters	--mac
Screen Output	No

Figure 507. CLI on line help on "remove" command usage in this node context

```
/cli/mac-table/status/switch> remove ?

Usage:
 REMOVE          Remove one Switch MAC entry from the Table. All parameters are
mandatory except when shown "--".

  <MANDATORY>
  --mac      Identify/Set a MAC entry, in this context.

  [OPTIONAL]
  --serviceID    Select an OLT service by ID.
  --slotIdentifies a slot. (not used for LAG)
  --vlan     Choose a VLAN ID
```

"show" command

Table 412. "show" command information

Name	show
Description	Show the Switch MAC Table.
Full path	/mac-table/status/switch/show
Mandatory Parameters	--slot
Screen Output	Table Figure 509. Table parameters description in Table 413

Figure 508. CLI on line help on "show" command usage in this node context

```
/cli/mac-table/status/switch> show ?

Usage:
 SHOW          Show the Switch MAC Table.

  <MANDATORY>
  --slotIdentifies a slot.

  [OPTIONAL]
  --port     Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
```

Figure 509. Output of ”show” command in this node context

```
/cli/mac-table/status/switch> show
+-------------------------------------------------------------------------------------------+
|Slot 1 XCO-160 - Switch MAC Table                                                          |
+-----+---------+------+-----------------------------------------+-----+-----------------+
|Slot |Port     |ONU ID|(ID) OLT Service                         |VLAN |MAC              |
+-----+---------+------+-----------------------------------------+-----+-----------------+
+-----+---------+------+-----------------------------------------+-----+-----------------+
Total Number of MAC entries: 0

/cli/mac-table/status/switch>
```

Table 413. “show” command output table parameters

Parameter	Description
Slot	Indicates the Slot
Port	Indicates the Port
(ID) OLT Service	Indicates the service identifier (ID) and name
VLAN	Indicates the used VLAN
MAC	Indicates the learned MAC address

“multicast” node

Figure 510. “multicast” node tree

```
/cli/multicast> tree
+ multicast[]
  + active-groups[@status]
  + group-list[@config, @create, @remove, @show, @showconfig]
  + probes[@config, @create, @remove, @show, @showconfig]
    + statistics[@show]
  + proxy[]
    + igmp-proxy[@config, @show, @showconfig]
    + querier[@config, @show, @showconfig]
```

“active-groups” sub-node

“status” command

Table 414. "status" command information

Name	status
Description	With no arguments shows the active-channels list. With both arguments shows the users list for the selected channel.
Full path	/multicast/active-groups/status
Mandatory Parameters	No

Screen Output	Tables Figure 512.Tables parameter description Table 415

Figure 511. CLI on line help on "status" command usage in this node context

```
/cli/multicast/active-groups> status ?

Usage:
 STATUS          With no arguments shows the active-channels list. With both arguments
shows the users list for the selected channel.

  [OPTIONAL]
  --ip-address    IPv4 address
  --serviceID     Select an OLT service by ID.
  --static-group Search for a static or dynamic group (enable|disable)
```

Figure 512. Output of "status" command with no arguments in this node context"

```
/cli/multicast/active-groups> status
+-------------------------------------------------------------------------------+
|Active Channels List                                                           |
+-----------------------------------+----------+----------------+----------------+
|(ID) Service                       |Static    |Source IP       |IP Address      |
+-----------------------------------+----------+----------------+----------------+
+-----------------------------------+----------+----------------+----------------+
/cli/multicast/active-groups>
```

This command used with arguments shows the users list for the selected channel.

Table 415. "status" command output table parameters

Parameter	Description
(ID) Service	Indicates the service identifier (ID) and name
Static	Indicates if the channel is Static
IP	Indicates the IPv4 multicast address
Source	Indicates the multicast Source

"group-list" sub-node

"config" command

Table 416. "config" command information

Name	config
Description	Configure an existing multicast group.
Full path	/multicast/group-list/config
Mandatory	--ID

Parameters	
Screen Output	No

Figure 513. CLI on line help on "config" command usage in this node context

```
/cli/multicast/group-list> config ?

Usage:
 CONFIG        Configure an existing multicast group

  <MANDATORY>
  --ID  Identifies a table entry by ID, in this context.

  [OPTIONAL]
  --admin   Administrative State. Enable/disable, in this context. (enable|disable)
  --group-mask Group IP address mask
  --ip-address    IPv4 address
  --name    Insert a name STRING.
  --serviceID    Select an OLT service by ID.
  --static-group Configure the multicast group as dynamic(default) or as static
```

"create" command

Table 417. "create" command information

Name	create
Description	Creates a new multicast group
Full path	/multicast/group-list /create
Mandatory Parameters	--ip-address --name --serviceID
Screen Output	No

Figure 514. CLI on line help on "create" command usage in this node context

```
/cli/multicast/group-list> create ?

Usage:
 CREATE        Create a new multicast group
```

```
<MANDATORY>
--ip-address    IPv4 address
--name    Insert a name STRING.
--serviceID    Select an OLT service by ID.

[OPTIONAL]
--admin   Administrative State. Enable/disable, in this context. (enable|disable)
--group-mask Group IP address mask
--static-group Configure the multicast group as dynamic(default) or as static
```

"remove" command

Table 418. "remove" command information

Name	remove
Description	Remove an existing multicast group
Full path	/multicast/group-list/remove
Mandatory Parameters	--ID
Screen Output	No

Figure 515. CLI on line help on "remove" command usage in this node context

```
/cli/multicast/group-list> remove ?

Usage:
 REMOVE        Remove an existing multicast group

 <MANDATORY>
 --ID  Identifies a table entry by ID, in this context.
```

"show" command

Table 419. "show" command information

Name	show
Description	Show the current configured multicast groups
Full path	/multicast/group-list/show
Mandatory Parameters	This commandf has no parameters

Screen Output	Tables Figure 517.Tables parameter description Table 420

Figure 516. CLI on line help on "show" command usage in this node context

```
/cli/multicast/group-list> show ?


Usage:
  SHOW          Show the current configured multicast groups
```

Figure 517.Partial view of "show" command output in this node context"

```
+-----------------------------------------------------------------------------------------------------------+
|Group List                                                                                                 |
+---+--------+------------------------------+-----------------------------------+--------+---------------+----+
|ID |Admin   |Name                          |Service                            |Static  |IP Address     |Mask|
+---+--------+------------------------------+-----------------------------------+--------+---------------+----+
|57 |enabled |57                            |(03) iptv spirent 1                |disabled|232.1.1.57     |32  |
|58 |enabled |58                            |(03) iptv spirent 1                |disabled|232.1.1.58     |32  |
|59 |enabled |59                            |(03) iptv spirent 1                |disabled|232.1.1.59     |32  |
|60 |enabled |60                            |(03) iptv spirent 1                |disabled|232.1.1.60     |32  |
|61 |enabled |61                            |(03) iptv spirent 1                |disabled|232.1.1.61     |32  |
|62 |enabled |62                            |(03) iptv spirent 1                |disabled|232.1.1.62     |32  |
|63 |enabled |63                            |(03) iptv spirent 1                |disabled|232.1.1.63     |32  |
|64 |enabled |64                            |(03) iptv spirent 1                |disabled|232.1.1.64     |32  |
```

Table 420. "show" command output table parameters

Parameter	Description
ID	Indicates the group ID
Admin	Indicates the group Administrative State
Name	Indicates the group Name
Service	Identifies service, to which the static channel belongs to, by (ID) and Name
Static	Indicates if the Multicast group is Static
Channel IP	Indicates IPv4 group address
Mask	Indicates the group mask

"showconfig" command

Table 421. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/multicast/group-list/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 518. CLI on line help on "showconfig" command usage in this node context

```
/cli/ multicast/group-list> showconfig ?

Usage:
 SHOWCONFIG      Print the command list that enforces the current configuration
```

"probes" sub-node

"config" command

Table 422. "config" command information

Name	config
Description	Modify parameters for an existing probe.
Full path	/multicast/probes/config
Mandatory Parameters	--ID
Screen Output	No

Figure 519. CLI on line help on "config" command usage in this node context

```
/cli/multicast/probes> config ?

Usage:
 CONFIG         Modify parameters for an existing probe.

  <MANDATORY>
  --ID  Identifies a table entry by ID, in this context.

  [OPTIONAL]
  --admin   Administrative State. Enable/disable, in this context. (enable|disable)
  --ip-mcast      IPv4 multicast address
  --port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --serviceID     Select an OLT service by ID.
  --slotIdentifies a slot. (not used for LAG)
```

“create” command

Table 423. "create" command information

Name	create
Description	Create a Probe for a multicast service uplink interface
Full path	/ multicast/probes/create
Mandatory Parameters	--ip-mcast --port --serviceID
Screen Output	No

Figure 520. CLI on line help on “create” command usage in this node context

```
/cli/multicast/probes> create ?

Usage:
 CREATE        Create a Probe for a multicast service uplink interface.

  <MANDATORY>
  --ip-mcast[=STRING] IPv4 multicast address
  --port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --serviceID     Select an OLT service by ID.

  [OPTIONAL]
  --admin   Administrative State. Enable/disable, in this context.  (enable|disable)
  --slotIdentifies a slot. (not used for LAG)
```

“remove” command

Table 424. "remove" command information

Name	remove
Description	Remove an existing Probe.
Full path	/multicast/probes/remove
Mandatory Parameters	--ID
Screen Output	No

Figure 521. CLI on line help on “remove” command usage in this node context

```
/cli/multicast/probes> remove ?

Usage:
 REMOVE        Remove an existing Probe.

  <MANDATORY>
  --ID  Identifies a table entry by ID, in this context.
```

“show” command

Table 425. "show" command information

Name	show
Description	Show the current multicast probes configuration.
Full path	/multicast/probes/show
Mandatory Parameters	This command has no parameters
Screen Output	Tables Figure 523.Table parameters description Table 426

Figure 522. CLI on line help on “show” command usage in this node context

```
/cli/multicast/probes> show ?

Usage:
 SHOW          Show the current multicast probes configuration.
```

Figure 523.Output of ”show” command in this node context”

```
+-------------------------------------------------------------------------------+
|Multicast Probes                                                               |
+---+--------+----+-------+-------------------------------------+---------------+
|ID |Admin   |Slot|Port   |Service (ID) Name                    |Multicast IP   |
+---+--------+----+-------+-------------------------------------+---------------+
|1  |enable  | 3  |Eth 3  |(03) iptv spirent 1                  |232.1.1.10     |
+---+--------+----+-------+-------------------------------------+---------------+
```

Table 426. “show” command output table parameters

Parameter	Description
ID	Indicates the multicast probe ID
Admin	Indicates the Administrative State
Slot	Indicates the Slot the multicast probe is applied to

Port	Indicates the Port the multicast probe is applied to
Service (ID) name	Identifies service, to which the probe belongs to, by ID and Name
Mcast IP	Indicates IPv4 Multicast address

"showconfig" command

Table 427. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/multicast/probes/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 524. CLI on line help on "showconfig" command usage in this node context

```
/cli/ multicast/probes > showconfig ?

Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

"statistics" sub-node

"show" command

Table 428. "show" command information

Name	show
Description	Show the statistics information for the selected probe by ID..
Full path	/multicast/probes/statistics/show
Mandatory Parameters	--ID
Screen Output	Tables Figure 526.Table parameters description Table 429

Figure 525. CLI on line help on "show" command usage in this node context

```
/cli/multicast/probes/statistics> show ?

Usage:
  SHOW          Show
```

<MANDATORY>
--ID Identifies a table entry by ID, in this context.

[OPTIONAL]
--port Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
--slotIdentifies a slot. (not used for LAG)

Figure 526.Output of "show" command in this node context"

```
+-------------------------------------------------------------------------------+
|Probe ID 1 Counters                                                            |
+---------------+-------------------------------+-------------------------------+
|               |Upstream                       |Downstream                     |
+---------------+---------------+---------------+---------------+---------------+
|               |Total          |Partial        |Total          |Partial        |
+---------------+---------------+---------------+---------------+---------------+
|Total          |-              |-              |285            |0              |
|Unicast        |-              |-              |192            |0              |
|Multicast      |-              |-              |0              |0              |
|Broadcast      |-              |-              |93             |0              |
|Dropped        |-              |-              |590            |0              |
+---------------+---------------+---------------+---------------+---------------+
```

Table 429. "show" command output table parameters

Upstream&downstream (Total & Partial) counters	
Parameter	**Description**
Unicast	Total number of Unicast packets
Multicast	Total number of Multicast packets
Broadcast	Total number of Broadcast packets
Dropped	Total number of Dropped packets
Total	Total number (all types) of packets

"proxy" sub-node

"igmp-proxy" sub-node

"config" command

Table 430. "config" command information

Name	config
Description	Configure the IGMPv3 proxy information.
Full path	/multicast/ proxy/igmp-proxy/config

Mandatory Parameters	No
Screen Output	No

Figure 527. CLI on line help on "config" command usage in this node context

```
/cli/multicast/proxy/igmp-proxy> config ?

Usage:
  CONFIG        Configure the IGMPv3 proxy information.

  [OPTIONAL]
  --admin   Administrative State. Enable/disable, in this context. (enable|disable)
  --client-version     Set Description
  --max-records-per-report     Set Description
  --network-version Set Description
  --priority Set Description
  --robustness    Set Description
  --unsolicited-report-interval       Set Description
```

"show" command

Table 431. "show" command information

Name	show
Description	Show the current configuration.
Full path	/multicast/proxy/igmp-proxy/show
Mandatory Parameters	This command has no parameters
Screen Output	Tables Figure 529.Table parameters description Table 432

Figure 528. CLI on line help on "show" command usage in this node context

```
/cli/multicast/ proxy/igmp-proxy > show ?

Usage:
  SHOW          Show the current configuration.
```

Figure 529.Output of "show" command in this node context"

```
+-----------------------------------------------------------------------------------------------------------------+
|IGMP Proxy
+--------+---------+---------------+--------------+----------+---------------------------+-----------------------+
|Admin   |Priority |Network Version |Client Version |Robustness |Unsolicited Report Interval |Max Records per Report |
+--------+---------+---------------+--------------+----------+---------------------------+-----------------------+
|enable |5         |2              |2             |2          |1                          |64                     |
+--------+---------+---------------+--------------+----------+---------------------------+-----------------------+
```

Table 432. "show" command output table parameters

Parameter	Description
Admin	IGMP Proxy Administrative State
Priority	pbit value in the IGMP packets (0<=n<=7)
Proxy	Proxy IP address used by the IGMP packets generated by the OLT
Version	**Network**: IGMP version used in the Network interfaces **Client:** IGMP version used in the client interfaces
Robustness	Specifies the number of retransmissions sent. Should be adjusted for the expected packet loss on the network.
Unsolicited Report Interval	Time interval between repetitions of a host's initial group membership report.
Max Records per Report	Maximum number of group-records that can be included in the same membership report.

"showconfig" command

Table 433. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/multicast/proxy/igmp-proxy/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 530. CLI on line help on "showconfig" command usage in this node context

```
/cli/ multicast/ proxy/igmp-proxy> showconfig ?

Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

"querier" sub-node

"config" command

Table 434. "config" command information

Name	config
Description	Configure the IGMPv3 querier information
Full path	/multicast/proxy/querier/config
Mandatory Parameters	No
Screen Output	No

Figure 531. CLI on line help on "config" command usage in this node context

```
/cli/multicast/proxy/querier> config ?

Usage:
  CONFIG         Configure the IGMPv3 querier information.

  [OPTIONAL]
  --last-member-query-count Set Description
  --last-member-query-interval     Set Description
  --querier-ip     Set Description
  --query-interval     Set Description
  --query-response-interval    Set Description
  --startup-query-count   Set Description
  --startup-query-interval       Set Description
```

"show" command

Table 435. "show" command information

Name	show
Description	Show the current configuration.
Full path	/multicast/proxy/querier/show
Mandatory Parameters	This command has no parameters
Screen Output	Tables Figure 533.Table parameters description Table 436

Figure 532. CLI on line help on "show" command usage in this node context

```
/cli/multicast/ proxy/querier > show ?

Usage:
 SHOW          Show the current configuration.
```

Figure 533.Output of "show" command in this node context"

```
|Querier
|Querier IP      |Query Interval   |Query Response Interval|Startup Query Interval|Startup Query Count|Last Member Query Interval|Last Member Query Count|
|10.0.0.10       |125              |100                    |31                    |2                  |10                        |2                      |
```

Table 436. "show" command output table parameters

Parameter	Description
Querier IP	Querier IP Address
Query Interval	Time Interval (in seconds) between the transmissions of each General Querier to the clients. The value must be in the range 30 to 1800.
Query Response Interval	Interval between retransmissions of general queries sent to the clients.
Startup Querier Interval	Interval between retransmissions of general queries sent by the proxy on startup.
Startup Querier Count	Number of general queries sent by the proxy on startup.sent. Should be adjusted for the expected packet loss on the network.
Last Member Querier Interval	Max Response Time used to calculate the Max Resp Code inserted into Group-Specific queries sent in response to Leave Group messages.
Last Member Querier Count	Number of Group-Specific Queries sent before the router assumes there are no local members.

"showconfig" command

Table 437. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/multicast/proxy/querier/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 534. CLI on line help on "showconfig" command usage in this node context

```
/cli/ multicast/ proxy/querier> showconfig ?

Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

"profiles" node

Figure 535."profiles" node tree

```
/cli/profiles> tree
+ profiles[]
  + ethernet[@config, @create, @remove, @show, @showconfig]
  + onu[@config, @create, @remove, @show, @showconfig]
  + pcp-priorities[@config, @create, @remove, @show, @showconfig]
  + upstream[@config, @create, @remove, @show, @showconfig]
  + voip[]
    + server[@availableValues, @config, @create, @remove, @show, @showconfig]
    + specific[@config, @create, @remove, @show, @showconfig]
```

"ethernet" sub-node

"config" command

Table 438. "config" command information

Name	config
Description	Configure ethernet traffic profiles.
Full path	/profiles/ethernet/config
Mandatory Parameters	--profileID
Screen Output	No

Figure 536. CLI on line help on "config" command usage in this node context

```
/cli/profiles/ethernet> config ?

Usage:
```

```
CONFIG          Configure ethernet traffic profiles.

<MANDATORY>
--profileID     Identifies a profile by ID.

[OPTIONAL]
--admin    Administrative State. Enable/disable, in this context. (enable|disable)
--cbs Committed Burst Size: maximum number of bytes in a burst of packets that
 should be guaranteed (bytes)
--cir Committed Information Rate: bandwidth that should be guaranteed on average
 (bit/s)
--ebs Excess Burst Size: maximum number of bytes in a burst of packets if there is no
traffic congestion (bytes)
--eir  Excess Information Rate: bandwidth in excess that can be supplied in case there is
no traffic congestion (bits/s)
--name     Insert a name STRING.
```

"create" command

Table 439. "create" command information

Name	create
Description	Create an Ethernet traffic profile
Full path	/profiles/ethernet/create
Mandatory Parameters	This command has no parameters
Screen Output	No

Figure 537. CLI on line help on "create" command usage in this node context

```
/cli/profiles/ethernet> create ?

Usage:
CREATE          Create an Ethernet traffic profile
```

"remove" command

Table 440. "remove" command information

Name	remove
Description	Remove an Ethernet traffic profile
Full path	/profiles/ethernet/remove

Mandatory Parameters	--profileID
Screen Output	No

Figure 538. CLI on line help on “remove” command usage in this node context

```
/cli/profiles/ethernet> remove ?

Usage:
  REMOVE        Remove an Ethernet traffic profile

  <MANDATORY>
  --profileID     Identifies a profile by ID.
```

“show” command

Table 441. "show" command information

Name	show
Description	Show the current configured multicast groups
Full path	/profiles/ethernet/show
Mandatory Parameters	This commandf has no parameters
Screen Output	Tables Figure 540.Tables parameter description Table 442

Figure 539. CLI on line help on “show” command usage in this node context

```
/cli/profiles/ethernet> show ?

Usage:
  SHOW          Show ethernet traffic profiles.
```

Figure 540.Output of ”show” command in this node context”

```
/cli/profiles/ethernet> show
+-------------------------------------------------------------------------------------------------------------------+
|Ethernet Profiles                                                                                                  |
+---+-------------------------------+-------+---------------+---------------+---------------+---------------+
|ID |Name                           |Admin  |CIR            |CBS            |EIR            |EBS            |
+---+-------------------------------+-------+---------------+---------------+---------------+---------------+
|1  |CIR_1G_Default                 |enable |1000000000     |9600           |0              |0              |
|2  |CIR_100M_Default               |enable |100000000      |9600           |0              |0              |
+---+-------------------------------+-------+---------------+---------------+---------------+---------------+
/cli/profiles/ethernet>
```

Table 442. "show" command output table parameters

Parameter	Description
ID	Identifies Ethernet profile by ID
Name	Indicates Ethernet profile name
Admin	Indicates Ethernet profile administrative state
CIR	Indicates Committed information rate
CBS	Indicates Committed Burst Size
EIR	Indicates Excess Information Rate
EBS	Indicates Excess Burst Size

"showconfig" command

Table 443. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/profiles/ethernet/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 541. CLI on line help on "showconfig" command usage in this node context

```
/cli/profiles/ethernet> showconfig ?

Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

"onu" sub-node

"config" command

Table 444. "config" command information

Name	config
Description	Configure ONU profiles.
Full path	/profiles/onu/config
Mandatory Parameters	--profileID
Screen Output	No

Figure 542. CLI on line help on "config" command usage in this node context

```
/cli/profiles/onu> config ?

Usage:
 CONFIG        Configure

  <MANDATORY>
  --profileID     Identifies a profile by ID.

  [OPTIONAL]
  --admin   Administrative State. Enable/disable, in this context. (enable|disable)
  --model   define the Model Name
  --name    Insert a name STRING.
  --port-num     The number of ports
  --port-type    The type of a port (eth|pon|voip|rf)
  --vendor  define the Vendor Name
```

"create" command

Table 445. "create" command information

Name	create
Description	Create an ONU profile
Full path	/profiles/onu/create
Mandatory Parameters	No
Screen Output	No

Figure 543. CLI on line help on "create" command usage in this node context

```
/cli/profiles/onu> create ?

Usage:
 CREATE        Create

  [OPTIONAL]
  --admin   Administrative State. Enable/disable, in this context. (enable|disable)
  --model   define the Model Name
```

```
--name     Insert a name STRING.
--port-num      The number of ports
--port-type     The type of a port (eth|pon|voip|rf)
--vendor  define the Vendor Name
```

“remove” command

Table 446. "remove" command information

Name	remove
Description	Remove an ONU profile
Full path	/profiles/onu/remove
Mandatory Parameters	--profileID
Screen Output	No

Figure 544. CLI on line help on “remove” command usage in this node context

```
/cli/profiles/onu> remove ?

Usage:
 REMOVE         Remove

  <MANDATORY>
  --profileID     Identifies a profile by ID.
```

“show” command

Table 447. "show" command information

Name	show
Description	Show the current configuration
Full path	/profiles/onu/show
Mandatory Parameters	This commandf has no parameters
Screen Output	Table Figure 546.Table parameters description Table 448

Figure 545. CLI on line help on “show” command usage in this node context

```
/cli/profiles/onu> show ?
```

```
Usage:
  SHOW          Show the current configuration.
```

Figure 546.Output of "show" command in this node context"

```
/cli/profiles/onu> show
+-------------------------------------------------------------------------------------------------------------------+
|ONUs Profiles                                                                                                      |
+-------------------------------------------------------------------------------------+-----------------------------+
|                                                                                     |Ports                        |
+---+--------------------+-------+--------------------+--------------------+-----+-----+-----+-----+-----+-----+
|ID |Name                |Admin  |Vendor              |Model               |PON  |Eth  |RF   |VoIP |E1   |VEIP |
+---+--------------------+-------+--------------------+--------------------+-----+-----+-----+-----+-----+-----+
|1  |SFU                 |enable |PTIN                |SFU                 |1    |1    |1    |0    |0    |0    |
|2  |4GE-2FXS            |enable |PTIN                |4GE-2FXS            |1    |4    |1    |2    |0    |0    |
+---+--------------------+-------+--------------------+--------------------+-----+-----+-----+-----+-----+-----+
/cli/profiles/onu>
```

Table 448. "show" command output table parameters

Parameter	Description
ID	Indicates the Profile ID
Name	Indicates the Profile Name
Admin	Indicates Administrative State
Vendor	ONU Vendor Name
Model	ONU Model name
Ports	-
PON	Number of ONU GPON ports
Eth	Number of ONU Ethernet ports
RF	Number of ONU RF ports
VoIP	Number of ONU FXS ports

"showconfig" command

Table 449. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/profiles/onu/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 547. CLI on line help on "showconfig" command usage in this node context

```
/cli/profiles/onu> showconfig ?

Usage:
  SHOWCONFIG    Print the command list that enforces the current configuration
```

“pbits-to-pq” sub-node

“config” command

Table 450. "config" command information

Name	config
Description	Configure/activate an existing profile.
Full path	/profiles/ pbits-to-pq /config
Mandatory Parameters	--profileID
Screen Output	No

Figure 548. CLI on line help on “config” command usage in this node context

```
/cli/profiles/ pbits-to-pq > config ?

Usage:
 CONFIG                 Configure/activate an existing profile.

  <MANDATORY>
  --ID                  Identifies a table entry by ID, in this context.

  [OPTIONAL]
  --admin               Administrative State. Enable/disable, in this context. (enable|disable)
  --name                Define a name for the specified profile.
  --pcp-bit             Define the PCP value (0..7).
  --priority            Specify the priority (0..7)
```

“create” command

Table 451. "create" command information

Name	create
Description	Create a new profile that assigns PCPs to priorities
Full path	/profiles/ pbits-to-pq /create
Mandatory Parameters	No
Screen Output	No

Figure 549. CLI on line help on "create" command usage in this node context

```
/cli/profiles/pcp-priorities> create ?

Usage:
  CREATE                  Create a new profile that assigns PCPs to priorities.

  [OPTIONAL]
  --ID                    Identifies a table entry by ID, in this context.
  --admin                 Administrative State. Enable/disable, in this context. (enable|disable)
  --name                  Define a name for the specified profile.
  --pcp-bit               Define the PCP value (0..7).
  --priority              Specify the priority (0..7)
```

"remove" command

Table 452. "remove" command information

Name	remove
Description	Remove an existing profile
Full path	/profiles/pcp-priorities/remove
Mandatory Parameters	--ID
Screen Output	No

Figure 550. CLI on line help on "remove" command usage in this node context

```
/cli/profiles/ pbits-to-pq > remove ?

Usage:
  REMOVE                  Remove an existing profile.

  <MANDATORY>
  --ID                    Identifies a table entry by ID, in this context.
```

“show” command

Table 453. "show" command information

Name	show
Description	Show existing profiles.
Full path	/profiles/ pbits-to-pq /show
Mandatory Parameters	This commandf has no parameters
Screen Output	Table Figure 552.Table parameters description Table 454

Figure 551. CLI on line help on “show” command usage in this node context

```
/cli/profiles/pbits-to-pq> show ?

Usage:
  SHOW                    Show existing profiles.
```

Figure 552.Output of ”show” command in this node context”

```
/cli/profiles/pbits-to-pq> show
+-------------------------------------------------------------------------+
|P-bits to Priority Queue Profiles                                        |
+---+--------------------------------+-------+-------+---------------+
|   |                                |       |       |P-bits         |
+---+--------------------------------+-------+-------+-+-+-+-+-+-+-+-+
|ID |Name                            |Admin  |P-Queue|0|1|2|3|4|5|6|7|
+---+--------------------------------+-------+-------+-+-+-+-+-+-+-+-+
|1  |default                         |enable |0      |x|x|x|x|x|x|x|x|
|1  |                                |enable |1      | | | | | | | | |
|1  |                                |enable |2      | | | | | | | | |
|1  |                                |enable |3      | | | | | | | | |
|1  |                                |enable |4      | | | | | | | | |
|1  |                                |enable |5      | | | | | | | | |
|1  |                                |enable |6      | | | | | | | | |
|1  |                                |enable |7      | | | | | | | | |
+---+--------------------------------+-------+-------+-+-+-+-+-+-+-+-+
/cli/profiles/pbits-to-pq>
```

Table 454. “show” command output table parameters

Parameter	Description
ID	Indicates the Profile ID
Name	Indicates the Profile Name
Admin	Indicates Administrative State
Prior.	Indicates Priority
PCPs	Indicates PCPbit configuration bits (0 to 7)

“showconfig” command

Table 455. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/profiles/onu/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 553. CLI on line help on “showconfig” command usage in this node context

```
/cli/profiles/ pbits-to-pq > showconfig ?

Usage:
 SHOWCONFIG      Print the command list that enforces the current configuration
```

“upstream” sub-node

“config” command

Table 456. "config" command information

Name	config
Description	Configure GPON upstream DBA profiles.
Full path	/profiles/upstream/config
Mandatory Parameters	--profileID
Screen Output	No

Figure 554. CLI on line help on “config” command usage in this node context

```
/cli/profiles/upstream> config ?

Usage:
 CONFIG         Configure GPON upstream DBA profiles.

  <MANDATORY>
```

```
  --profileID     Identifies a profile by ID.

  [OPTIONAL]
  --BWeligibility     Defines how the non assured bandwidth is handled. (non-assured|best-
   effort)
  --admin    Administrative State. Enable/disable, in this context. (enable|disable)
  --assuredBW  Maximum bandwidth for DYN type with a granularity of 8kbps.
  --dbaSet the MAC GPON DBA algorithm to 'Status Reporting' if enabled or       Traffic
Monitoring' if disabled. (enable|disable)
  --fixedBW     Fixed bandwidth used in CBR and UBR types with a granularity of 8kbps.
  --maxBW      Maximum bandwidth that results from the sum: Fixed BW + Assured BW
+  bandwidth not assured.
  --name     Insert a name STRING.
  --type     Identifies the profile type (CBR|UBR|DYN)
```

"create" command

Table 457. "create" command information

Name	create
Description	Create a GPON upstream DBA profile
Full path	/profiles/upstream/create
Mandatory Parameters	--fixedBW --name --type
Screen Output	No

Figure 555. CLI on line help on "create" command usage in this node context

```
/cli/profiles/upstream> create ?

Usage:
 CREATE        Create

  <MANDATORY>
  --fixedBW     Fixed bandwidth used in CBR and UBR types with a granularity of 8kbps.
  --name     Insert a name STRING.
  --type     Identifies the profile type. (cbr|ubr|dyn)

  [OPTIONAL]
```

```
  --BWeligibility     Defines how the non assured bandwidth is handled. (non-assured|best-
effort)
  --admin    Administrative State. Enable/disable, in this context. (enable|disable)
  --assuredBW  Maximum bandwidth for DYN type with a granularity of 8kbps.
  --dbaSet the MAC GPON DBA algorithm to 'Status Reporting' if enabled or       'Traffic
Monitoring' if disabled. (enable|disable)
  --maxBW       Maximum bandwidth that results from the sum: Fixed BW + Assured BW
+  bandwidth not assured.
```

"remove" command

Table 458. "remove" command information

Name	remove
Description	Remove a GPON upstream DBA profile
Full path	/ profiles/upstream/remove
Mandatory Parameters	--profileID
Screen Output	No

Figure 556. CLI on line help on "remove" command usage in this node context

```
/cli/profiles/upstream> remove ?

Usage:
 REMOVE        Remove

  <MANDATORY>
  --profileID     Identifies a profile by ID.
```

"show" command

Table 459. "show" command information

Name	show
Description	Show GPON upstream DBA profile.
Full path	/profiles/upstream/show
Mandatory Parameters	This command has no parameters
Screen Output	Table Figure 558.Table parameters description Table 460

Figure 557. CLI on line help on "show" command usage in this node context

```
/cli/profiles/upstream-dba> show ?

Usage:
  SHOW          Show GPON upstream DBA profile.
```

Figure 558.Output of "show" command in this node context"

```
/cli/profiles/upstream-dba> show
+-------------------------------------------------------------------------------------------------------------------------------+
|Upstream DBA Profiles                                                                                                          |
+---+------------------------------+---------+----+---------+---------+---------+--------------+--------------------+
|ID |Name                          |Admin    |Type|Fixed BW |Assured BW|Max BW  |BW Eligibility |DBA Algorithm       |
+---+------------------------------+---------+----+---------+---------+---------+--------------+--------------------+
|1  |FIXED_2M                      |enable   |cbr |2048     |0        |2048     |--            |disable             |
|2  |ASSURED_10M                   |enable   |dyn |0        |10048    |10048    |--            |disable             |
|3  |ASSURED_10M_MAX_20M           |enable   |dyn |0        |10048    |20096    |non-assured   |disable             |
|4  |MAX_20M                       |enable   |dyn |0        |0        |20096    |best-effort   |disable             |
|5  |FIXED_5M_ASSURED_10M_MAX_50M  |enable   |dyn |5056     |10048    |50240    |non-assured   |disable             |
+---+------------------------------+---------+----+---------+---------+---------+--------------+--------------------+
/cli/profiles/upstream-dba>
```

Table 460. "show" command output table parameters

Parameter	Description
ID	Identifies upstream profile by ID
Name	Identifies upstream profile by name
Admin	Indicates upstream profile administrative state
Type	Indicates upstream profile type
Fixed BW	indicates upstream profile fixed bandwidth
Assured BW	Indicates upstream profile assured bandwidth
Max BW	Indicates upstream profile maximum bandwidth
BW eligibility	Indicates upstream profile bandwidth eligibility
DBA algorithm	Indicates if DBA algorithm is used

"showconfig" command

Table 461. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/profiles/upstream-dba/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 559. CLI on line help on "showconfig" command usage in this node context

```
/cli/profiles/upstream-dba> showconfig ?
```

```
Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

"voip" sub-node

"server" sub-node

"availableValues" command

Table 462. " availableValues " command information

Name	availableValues
Description	Show Available Values for each parameter
Full path	/profiles/voip/server/ availableValues
Mandatory Parameters	This command has no parameters
Screen Output	Table Figure 561.Table parameters description Table 463

Figure 560. CLI on line help on "availableValues" command usage in this node context

```
/cli/profiles/voip/server> availableValues ?

Usage:
  AVAILABLEVALUES Show Available Values for each parameter
```

Figure 561.Output of " availableValues" command in this node context"

```
/cli/profiles/voip/server> availableValues
+-----------------------------------------------+
|Available Values                               |
+----------+-----+-----------------------------+
|Parameter |Value|Meaning                      |
+----------+-----+-----------------------------+
|voice-gw  |1    |Megaco GR 303 TR08           |
|          |2    |Megaco V5.x                  |
|          |3    |Megaco SoftSwitch            |
|          |4    |SIP BroadSoft                |
|          |5    |SIP Nortel/SoftSwitch        |
+----------+-----+-----------------------------+
/cli/profiles/voip/server>
```

Table 463. "availableValues" command output table parameters

Parameter	Description
Parameter	Identifies parameter by name
Value	Indicates parameter value
Meaning	Short description for each parameter value

"config" command

Table 464. "config" command information

Name	config
Description	Configure voip server profiles.
Full path	/profiles/voip/server/config
Mandatory Parameters	--profileID
Screen Output	No

Figure 562. CLI on line help on "config" command usage in this node context

```
/cli/profiles/voip/server> config ?

Usage:
 CONFIG        Configure

  <MANDATORY>
  --profileID     Identifies a profile by ID.

  [OPTIONAL]
  --admin   Administrative State. Enable/disable, in this context. (enable|disable)
  --gw-ip   IPv4 address for the default GW
  --name    Insert a name STRING.
  --server-ip     IPv4 address for the VoIP server
  --server-port   The VoIP server port
  --voice-gw      The Voice Gateway to choose. (see 'availableValues') (1..5)
```

"create" command

Table 465. "create" command information

Name	create
Description	Create a voip server profile
Full path	/profiles/voip/server/create
Mandatory Parameters	No
Screen Output	No

Figure 563. CLI on line help on "create" command usage in this node context

```
/cli/profiles/voip/server> create ?
```

```
Usage:
 CREATE        Create

 [OPTIONAL]
 --admin   Administrative State. Enable/disable, in this context. (enable|disable)
 --gw-ip   IPv4 address for the default GW
 --name    Insert a name STRING.
 --server-ip      IPv4 address for the VoIP server
 --server-port   The VoIP server port
 --voice-gw      The Voice Gateway to choose. (see 'availableValues') (1..5)
```

"remove" command

Table 466. "remove" command information

Name	remove
Description	Remove a voip server profile
Full path	/profiles/voip/server/remove
Mandatory Parameters	--profileID
Screen Output	No

Figure 564. CLI on line help on "remove" command usage in this node context

```
/cli/profiles/voip/server> remove ?

Usage:
 REMOVE        Remove

  <MANDATORY>
  --profileID     Identifies a profile by ID.
```

"show" command

Table 467. "show" command information

Name	show
Description	Show the current configuration.
Full path	/profiles/voip/server/show

Mandatory Parameters	This command has no parameters
Screen Output	Table Figure 566.Table parameters description Table 468

Figure 565. CLI on line help on "show" command usage in this node context

```
/cli/profiles/voip/server> show ?

Usage:
  SHOW          Show the current configuration.
```

Figure 566.Output of "show" command in this node context"

```
/cli/profiles/voip/server> show
+-------------------------------------------------------------------------------------------------------------------+
|VoIP Server Profiles                                                                                               |
+---+--------------------+----------+------------------------------+----------------+----------+-----------------+
|ID |Name                |Admin     |Voice Gateway                 |Server IP       |Port      |Default Gateway  |
+---+--------------------+----------+------------------------------+----------------+----------+-----------------+
+---+--------------------+----------+------------------------------+----------------+----------+-----------------+
/cli/profiles/voip/server>
```

Table 468. "show" command output table parameters

Parameter	Description
ID	Identifies a VoIP server profile by ID
Name	Identifies a VoIP server profile by name
Admin	Indicates VoIP server profile administrative state
Voice Gateway	Indicates the voice gateway in use
Server IP	Indicates IPv4 address for the VoIP server
Port	Indicates VoIP server TCP/IP port
Default Gateway	Indicates default Gateway IPv4 address

"showconfig" command

Table 469. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/profiles/voip/server/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 567. CLI on line help on "showconfig" command usage in this node context

```
/cli/profiles/voip/server> showconfig ?
```

```
Usage:
 SHOWCONFIG      Print the command list that enforces the current configuration
```

“specific” sub-node

“config” command

Table 470. "config" command information

Name	config
Description	Configure voip specific profiles.
Full path	/profiles/ voip/specific/config
Mandatory Parameters	--profileID
Screen Output	No

Figure 568. CLI on line help on “config” command usage in this node context

```
/cli/profiles/voip/specific> config ?

Usage:
 CONFIG        Configure

  <MANDATORY>
  --profileID     Identifies a profile by ID.

  [OPTIONAL]
  --admin   Administrative State. Enable/disable, in this context. (enable|disable)
  --ftp-ip    Set the FTP server IP address
  --name    Insert a name STRING.
```

"create" command

Table 471. "create" command information

Name	create
Description	Create a voip specific profile
Full path	/profiles/voip/specific/create
Mandatory Parameters	No
Screen Output	No

Figure 569. CLI on line help on "create" command usage in this node context

```
/cli/profiles/voip/specific> create ?

Usage:
 CREATE        Create

  [OPTIONAL]
  --admin   Administrative State. Enable/disable, in this context. (enable|disable)
  --ftp-ip    Set the FTP server IP address
  --name    Insert a name STRING.
```

"remove" command

Table 472. "remove" command information

Name	remove
Description	Remove a voip specific profile
Full path	/profiles/voip/specific/remove
Mandatory Parameters	--profileID
Screen Output	No

Figure 570. CLI on line help on "remove" command usage in this node context

```
/cli/profiles/voip/specific> remove ?

Usage:
 REMOVE        Remove

  <MANDATORY>
```

```
--profileID     Identifies a profile by ID.
```

"show" command

Table 473. "show" command information

Name	show
Description	Show the current configuration.
Full path	/profiles/voip/specific/show
Mandatory Parameters	This command has no parameters
Screen Output	Table Figure 572.Table parameters description Table 474

Figure 571. CLI on line help on "show" command usage in this node context

```
/cli/profiles/voip/specific> show ?

Usage:
  SHOW          Show the current configuration.
```

Figure 572.Output of "show" command in this node context"

```
/cli/profiles/voip/specific> show
+-------------------------------------------------+
|VoIP Specific Profiles                           |
+---+--------------------+----------+-------------+
|ID |Name                |Admin     |FTP Server   |
+---+--------------------+----------+-------------+
+---+--------------------+----------+-------------+
/cli/profiles/voip/specific>
```

Table 474. "show" command output table parameters

Parameter	Description
ID	Identifies a profile by ID
Name	Identifies a profile by name
Admin	Indicates profile administrative state
FTP Server	Indicates FTP server IPv4 address

"showconfig" command

Table 475. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/profiles/voip/specific/showconfig

Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 573. CLI on line help on "showconfig" command usage in this node context

```
/cli/profiles/voip/specific> showconfig ?

Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

"remote-eq" node

This node is used to manage remote equipments (ONUs) that the system is aware of (discovery sub-node).

In the discovery sub-node the user can see the available equipments, insert them to start being managed by this OLT, or provision the OLT for adding remote equipments later.

On the ONUs sub-node the user can make all the possible configurations on the remote equipment as well as view all the relative information.

On the status sub-node the user can view the status of links, and interfaces.

Figure 574."remote-eq" node tree

```
/cli/remote-eq> tree
+ remote-eq[@config-onu-id, @connect, @disconnect, @showconnected]
  + discovery[@change-reg-type, @command, @config, @create, @insert, @insert-all,
@reboot, @reboot-all, @remove, @remove-all, @show]
  + onu[@show]
    + analog-rf[@config, @show]
    + e1[@config-e1, @config-lsp, @config-pw, @show, @showconfig, @status]
    + ethernet[@config, @show]
    + ext-vlan-tag-op[@config, @show, @showconfig]
      + operation-table[@config, @create, @remove, @show, @showconfig]
    + ptp-source[@availableValues, @config, @create, @remove, @show]
    + services[@add, @availableValues, @config, @remove, @show]
      + t-cont-mapping[@config, @show, @showconfig]
    + system[@config, @show]
    + t-cont[@config, @create, @remove, @show, @showconfig]
    + voip[@config, @show]
  + statistics[]
```

```
    + fec[@show]
  + status[@show]
    + ethernet[]
      + statistics[@show]
    + firmware[@activate, @commit, @stop-transfer]
    + gem-port[]
      + statistics[@show]
    + services[@show]
      + active-channels[@show]
      + statistics[]
        + counters[@availableValues, @show, @show-active, @start, @stop]
        + dhcp[@show]
        + igmp[@show]
    + t-cont[@show]
```

"config-onu-id" command

Table 476. "config-onu-id" command information

Name	config-onu-id
Description	Configure an ONU ID for one ONU in state 'new'.
Full path	/remote-eq/config-onu-id
Mandatory Parameters	--onuID --serial-number
Screen Output	No

Figure 575. CLI on line help on "config-onu-id" command usage in this node context

```
/cli/remote-eq> config-onu-id ?

Usage:
 CONFIG-ONU-ID   Configure an ONU ID for one ONU in state 'new'.

  <MANDATORY>
  --onuID   Identifies an ONU by ID, in this context.
  --serial-number     Identify an ONU by serial Number.
```

“connect” command

This command defines the remote Equipment that will be used for all following commands.

Table 477. "connect" command information

Name	connect
Description	Set the ONU identifiers (slot, port, onuID) to be used in all future commands.
Full path	/remote-eq/connect
Mandatory Parameters	--onuID --port --slot
Screen Output	No

Figure 576. CLI on line help on “connect” command usage in this node context

```
/cli/remote-eq> connect ?

Usage:
  CONNECT          Set the ONU identifiers (slot, port, onuID) to be used in all future commands.

  <MANDATORY>
  --onuID   Identifies an ONU by ID, in this context.
  --port    Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot.
```

“disconnect” command

Table 478. "disconnect" command information

Name	disconnect
Description	Clear the connected ONU identifiers.
Full path	/remote-eq/disconnect
Mandatory Parameters	This command has no parameters
Screen Output	No

Figure 577. CLI on line help on “disconnect” command usage in this node context

```
/cli/remote-eq> disconnect ?
```

```
Usage:
  DISCONNECT      Clear the connected ONU identifiers.
```

“showconnected” command

Table 479. " showconnected " command information

Name	showconnected
Description	Shows the connected ONU identifiers.
Full path	/remote-eq/showconnected
Mandatory Parameters	This command has no parameters
Screen Output	Table, Figure 579. Table parameters description in Table 480.

Figure 578. CLI on line help on “showconnected” command usage in this node context

```
/cli/remote-eq> showconnected ?

Usage:
  SHOWCONNECTED   Show the connected ONU identifiers.
```

Figure 579.Output of ”showconnected” command in this node context”

```
/cli/remote-eq> showconnected
+-----------------------+
|Remote ONU Connected   |
+-----+----------+------+
|Slot |Port      |ONU ID|
+-----+----------+------+
| --  | --       | --   |
+-----+----------+------+
/cli/remote-eq>
```

Table 480. “showconnected” command output table parameters

Parameter	Description
Slot	Identifies the slot
Port	Identifies the OLT Port the ONU is connected to
ONU ID	Identifies ONU by ID

“discovery” sub-node

“change-reg-type” command

Table 481. "config" command information

Name	change-reg-type
Description	Modify the register type for a single ONU.
Full path	/remote-eq/discovery/change-reg-type
Mandatory Parameters	--onuID --port --register-type --slot
Screen Output	No

Figure 580. CLI on line help on “change-reg-type” command usage in this node context

```
/cli/remote-eq/discovery> change-reg-type ?

Usage:
  CHANGE-REG-TYPE              Modify the register type for a single ONU.

  <MANDATORY>
  --onuID                      Identifies an ONU by ID, in this context.
  --port                       Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --register-type              Set the ONU registration type. (serial-number|password|both)
  --slot                       Identifies a slot.

  [OPTIONAL]
  --password                   Set the password for ONU registration. Up to 10 ASCII characters or
precisely 20 in HEX format (STRING 20)
  --serial-number              Set the serial number for ONU registration (STRING 16)
```

“command” command

Table 482. "command" command information

Name	command
Description	Send one command to a specific ONU.
Full path	/remote-eq/discovery/command

Mandatory Parameters	--type
Screen Output	No

Figure 581. CLI on line help on "command" command usage in this node context

```
/cli/remote-eq/discovery> command ?

Usage:
  COMMAND                  Send one command to a specific ONU.

  <MANDATORY>
  --type                   Send the ITU-T G.984.3 'Disable_Serial_Number' command. (disable-
sn|enable-sn|resynch)

  [OPTIONAL]
  --onuID                  Identifies an ONU by ID, in this context.
  --port                   Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slot                   Identifies a slot. (not used for LAG)
```

"config" command

Table 483. "config" command information

Name	config
Description	Identify an ONU by (1)(slot,port,onuID) or (2)(serial-number). To modify the serial-number use (1)(2).
Full path	/ remote-eq/discovery/config
Mandatory Parameters	No
Screen Output	No

Figure 582. CLI on line help on "config" command usage in this node context

```
/cli/remote-eq/discovery> config ?

Usage:
  CONFIG         Identify an ONU by (1)(slot,port,onuID) or (2)(serial-number). To modify
the serial-number use (1)(2).

  [OPTIONAL]
```

```
--admin   Administrative State. Enable/disable, in this context. (enable|disable)
--fec-upstream   If enabled, apply Forward Error Correction (FEC) in the upstream
 direction. (enable|disable)
--onuID   Identifies an ONU by ID, in this context.
--port    Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
--profileID   Identifies a profile by ID.
--serial-number   Set the serial number for a specified ONU.
--slotIdentifies a slot. (not used for LAG)
--sw-upgrade-mode   Set the upgrade mode for this ONU. By choosing 'planned' the
file name  must be given as well. (off|auto|planned)
--sw-version  Define a string to match with a firmware file sw-version string.
```

"create" command

Table 484. "create" command information

Name	create
Description	Create a new ONU.
Full path	/remote-eq/discovery/create
Mandatory Parameters	--onuID --port --profileID --serial-number --slot
Screen Output	No

Figure 583. CLI on line help on "create" command usage in this node context

```
/cli/remote-eq/discovery> create ?

Usage:
 CREATE       Create a new ONU.

  <MANDATORY>
  --onuID   an ONU by ID, in this context.
  --port    Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --profileID   Identifies a profile by ID.
  --serial-number   Set the serial number for a specified ONU.
  --slotIdentifies a slot.

  [OPTIONAL]
```

```
--admin   Administrative State. Enable/disable, in this context. (enable|disable)
--fec-upstream   If enabled, apply Forward Error Correction (FEC) in the upstream
 direction. (enable|disable)
--sw-upgrade-mode   Set the upgrade mode for this ONU. By choosing 'planned' the
file name   must be given as well. (off|auto|planned)
--sw-version   Define a string to match with a firmware file sw-version string.
```

“insert” command

Table 485. "insert" command information

Name	insert
Description	Start managing a remote ONU. It must be in the 'new' state.
Full path	/ remote-eq/discovery/ insert
Mandatory Parameters	--profileID --serial-number
Screen Output	No

Figure 584. CLI on line help on “insert” command usage in this node context

```
/cli/remote-eq/discovery> insert ?

Usage:
 INSERT   Start managing a remote ONU. It must be in the 'new' state.

 <MANDATORY>
 --profileID   Identifies a profile by ID.
 --serial-number   Set the serial number for a specified ONU.

 [OPTIONAL]
 --admin   Administrative State. Enable/disable, in this context. (enable|disable)
 --fec-upstream   If enabled, apply Forward Error Correction (FEC) in the upstream
 direction. (enable|disable)
 --onuID   Identifies an ONU by ID, in this context.
 --sw-upgrade-mode   Set the upgrade mode for this ONU. By choosing 'planned' the
file   name must be given as well. (off|auto|planned)
 --sw-version   Define a string to match with a firmware file sw-version string.
```

“insert-all” command

Table 486. "insert-all" command information

Name	insert
Description	Start managing all ONUs on a given Slot, or a given interface.Default values will be used for all parameters. ONUs must be in the 'new' state.
Full path	/remote-eq/discovery/insert-all
Mandatory Parameters	--slot
Screen Output	No

Figure 585. CLI on line help on “insert-all” command usage in this node context

```
/cli/remote-eq/discovery> insert-all ?

Usage:
  INSERT-ALL       Start managing all ONUs on a given Slot, or a given interface.Default
values will be used for all parameters.ONUs must be in th

  <MANDATORY>
  --slot      Identifies a slot.

  [OPTIONAL]
  --port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
```

“reboot” command

Table 487. "reboot" command information

Name	reboot
Description	Send the reboot command to a specific ONU.
Full path	/remote-eq/discovery/reboot
Mandatory Parameters	No
Screen Output	No

Figure 586. CLI on line help on “reboot” command usage in this node context

```
/cli/remote-eq/discovery> reboot ?
```

```
Usage:
 REBOOT        Send the reboot command to a specific ONU.

 [OPTIONAL]
 --onuID   Identifies an ONU by ID, in this context.
 --port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
 --slotIdentifies a slot. (not used for LAG)
```

"reboot-all" command

Table 488. "reboot-all" command information

Name	reboot-all
Description	Send the reboot command to all ONUs (on a given Slot, or interface).
Full path	/remote-eq/discovery/reboot-all
Mandatory Parameters	--slot
Screen Output	No

Figure 587. CLI on line help on "reboot-all" command usage in this node context

```
/cli/remote-eq/discovery> reboot-all ?

Usage:
 REBOOT-ALL            Send the reboot command to all ONUs (on a given Slot, or interface).

 <MANDATORY>
 --slot                Identifies a slot.

 [OPTIONAL]
 --port                Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
```

"remove" command

Table 489. "remove" command information

Name	remove
Description	Stop managing a remote ONU. It will return to the 'new' state.
Full path	/remote-eq/discovery/remove

Mandatory Parameters	No
Screen Output	No

Figure 588. CLI on line help on "remove" command usage in this node context

```
/cli/remote-eq/discovery> remove ?

Usage:
 REMOVE        Stop managing a remote ONU. It will return to the 'new' state.

  [OPTIONAL]
  --onuID   Identifies an ONU by ID, in this context.
  --port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot. (not used for LAG)
```

"remove-all" command

Table 490. "remove-all" command information

Name	Remove-all
Description	Remove all inserted ONUs on a given Slot, or interface. Affected ONUs will return to the 'NEW' state if physically connected.
Full path	/remote-eq/discovery/remove-all
Mandatory Parameters	--slot
Screen Output	No

Figure 589. CLI on line help on "remove-all" command usage in this node context

```
/cli/remote-eq/discovery> remove-all ?

Usage:
 REMOVE-ALL        Remove all inserted ONUs on a given Slot, or interface. Affected ONUs will
return to the 'NEW' state if physically connected.

  <MANDATORY>
  --slot                    Identifies a slot.

  [OPTIONAL]
  --port                    Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1
```

“show” command

Table 491. "show" command information

Name	show
Description	Show the current configuration
Full path	/remote-eq/discovery/show
Mandatory Parameters	No
Screen Output	Table, Figure 591. Table parameters description in Table 492.

Figure 590. CLI on line help on “show” command usage in this node context

```
/cli/remote-eq/discovery> show ?

Usage:
  SHOW          Show the current configuration

  [OPTIONAL]
  --only-new    Show only entries with state equal to 'new'. (true|false)
  --port        Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot. (not used for LAG)
```

Figure 591.Output of ”show” command in this node context – partial view

```
|Remote Equipments List -- Page 1
|Slot |Port      |ONU  |Admin     |Serial Number    |Profile        |SW mode|SW version      |Status         |FEC       |Commands  |
|3    |PON 3     |1    |enable    |5054494E07D06F7E |(3) MBH        |Off    | --             |OK             |disabled  |reboot    |
|3    |PON 3     |2    |enable    |5054494E02826522 |(1) SFU        |Off    | --             |OK             |disabled  |reboot    |
|3    |PON 3     |3    |enable    |5054494E262753D7 |(1) SFU        |Off    | --             |Absent         |disabled  | --       |
|3    |PON 3     |4    |enable    |5054494E1DCEEBDA |(4) RGW        |Off    | --             |OK             |disabled  |reboot    |
|3    |PON 3     |5    |enable    |5054494E02826520 |(1) SFU        |Off    | --             |Absent         |disabled  | --       |
|3    |PON 15    |0    |disable   |5054494E393A9503 |(1) SFU        |Off    | --             |New            |disabled  | --       |
```

Table 492. “show” command output table parameters

Parameter	Description
Slot	Indicates a slot
Port	Indicates an OLT port
ONU	Identifies the ONU by ONU ID (number)
Admin	Indicates the ONU administrative state
Serial Number	Indicates the ONU serial number
Profile	Identifies the ONU profile by ID and name
SW Mode	Indicates the ONU configured software upgrade mode
SW version	Indicates the SW version
Status	Indicates the ONT state

FEC	Indicates if FEC is enabled
Commands	Indicates the available commands for use

"onu" sub-node

This node can be used to configure the remote ONU equipments.

All the commands in this node (and children) always apply to a specific ONU.

When executing each command the identification of the ONU must be provided.

In this sense all commands will have at least three parameters: slot, port, onuID.

If the user does not give those arguments, the command will use the information stored with /remote-eq/connect. If there is no information saved, it will display en error.

If there is information saved with the connect command, but the user gives another set of argument values, then the user given values take precedence over the existing ones.

All the showconfig commands will have the three parameters as well.

So, their structure will change (for this node and children only) and be the one depicted below.

"show" command

This command will give the user an overview of how many ONUs exists and where (slot, port), This command should be executed when trying to find the right values for the arguments <slot,port,onuID>.

For each slot, displays all the PONs and respective ONUs IDs.

The table can grow to be very large, hence it accepts two optional parameters to filter the information displayed

Table 493. "show" command information

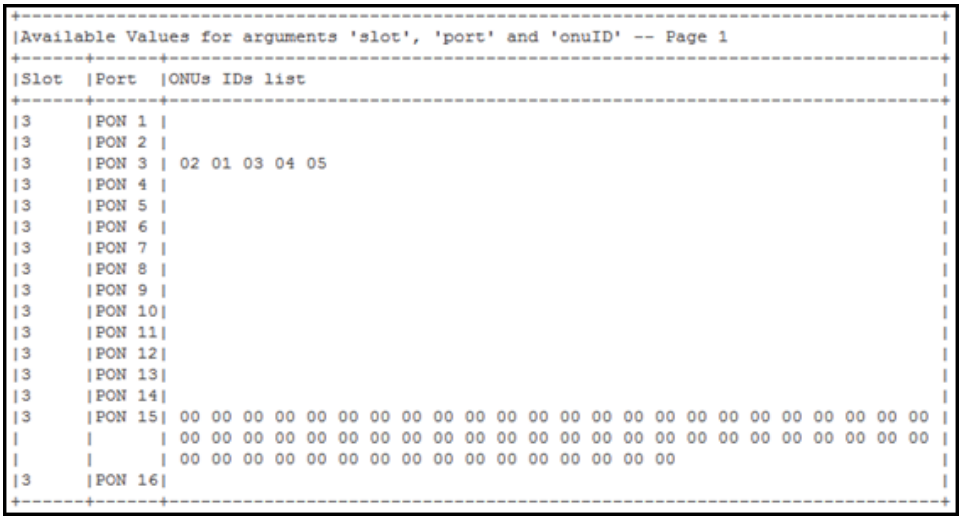
Name	show
Description	Display a table with all ONU IDs and their respective interfaces. Can filter the results with the optional arguments.
Full path	/ remote-eq/onu/ show
Mandatory Parameters	No
Screen Output	Table, Figure 593. Table parameters description in Table 494.

Figure 592. CLI on line help on "show" command usage in this node context

```
/cli/remote-eq/onu> show ?

Usage:
  SHOW          Display a table with all ONU IDs and their respective interfaces. Can filter
the results with the optional arguments.

  [OPTIONAL]
  --port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
```

```
--slotIdentifies a slot. (not used for LAG)
```

Figure 593.Output of ”show” command in this node context –partial view



```
+-------------------------------------------------------------------------------------------------------------------------------+
|Available Values for arguments 'slot', 'port' and 'onuID' -- Page 1                                                            |
+------+------+--------------------------------------------------------------------------------------------------------------------+
|Slot  |Port  |ONUs IDs list                                                                                                       |
+------+------+--------------------------------------------------------------------------------------------------------------------+
|3     |PON 1 |                                                                                                                    |
|3     |PON 2 |                                                                                                                    |
|3     |PON 3 | 02 01 03 04 05                                                                                                     |
|3     |PON 4 |                                                                                                                    |
|3     |PON 5 |                                                                                                                    |
|3     |PON 6 |                                                                                                                    |
|3     |PON 7 |                                                                                                                    |
|3     |PON 8 |                                                                                                                    |
|3     |PON 9 |                                                                                                                    |
|3     |PON 10|                                                                                                                    |
|3     |PON 11|                                                                                                                    |
|3     |PON 12|                                                                                                                    |
|3     |PON 13|                                                                                                                    |
|3     |PON 14|                                                                                                                    |
|3     |PON 15| 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
|      |      | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 |
|      |      | 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00 00                                                                    |
|3     |PON 16|                                                                                                                    |
+------+------+--------------------------------------------------------------------------------------------------------------------+
```

Table 494. “show” command output table parameters

Parameter	Description
Slot	Indicates a slot
Port	Indicates an OLT PON port
ONU ID list	Lists the ONUs connected to a PON port ONU ID (number)

“analog-rf” sub-node

“config” command

Table 495. "config" command information

Name	config
Description	Configures analog-RF parameters for the specified ONU
Full path	/ remote-eq/onu/analog-rf/config
Mandatory Parameters	No
Screen Output	No

Figure 594. CLI on line help on “config” command usage in this node context

```
/cli/remote-eq/onu/analog-rf> config ?
```

```
Usage:
 CONFIG        Configure

 [OPTIONAL]
 --admin   Administrative State. Enable/disable, in this context. (enable|disable)
 --filter  Choose how many channels to filter. (all|15|25|35)
 --onuID   Identifies an ONU by ID, in this context.
 --port    Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
 --slotIdentifies a slot. (not used for LAG)
```

"show" command

The show command used without parameters shows analog-RF information for the ONU specified with the command /remote-eq/connect –onuID=xx --slot=yy –port=ccc.zz.

If there is no connected ONU, all the parameters must be specified to address the desired ONU otherwise the command will return an error message, Figure 595

Figure 595."show" command return error

```
/cli/remote-eq/onu/analog-rf> show
No remote ONU specified.
/cli/remote-eq/onu/analog-rf>
```

Table 496. "show" command information

Name	show
Description	Show the current configuration
Full path	/remote-eq/onu/analog-rf/show
Mandatory Parameters	No
Screen Output	Table, Figure 597. Table parameters description in Table 497.

Figure 596. CLI on line help on "show" command usage in this node context

```
/cli/remote-eq/onu/analog-rf> show ?

Usage:
 SHOW        Show the current configuration

 [OPTIONAL]
 --onuID   Identifies an ONU by ID, in this context.
```

```
--port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
--slotIdentifies a slot. (not used for LAG)
```

Figure 597.Output of ”show” command in this node context

```
+-----------------------------------------------------------+
|Analog RF Interface                                        |
+---+----------+----------+-------------------------------+
|ID |Port      |Admin     |Filter                         |
+---+----------+----------+-------------------------------+
|0  |RF 1      |disable   |All channels                   |
+---+----------+----------+-------------------------------+
```

Table 497. “show” command output table parameters

Parameter	Description
ID	Identifies analog RF interface by ID
Port	Identifies analog RF interface by name
Admin	Indicates analog RF interface administrative state
Filter	Indicates type of channel filter used (how many filtered channels)

“e1” sub-node

“config-e1” command

Table 498. "config-e1" command information

Name	Config-e1
Description	Configure E1 interfaces for a given ONU.
Full path	/remote-eq/onu/e1/config-e1
Mandatory Parameters	--ID
Screen Output	No

Figure 598. CLI on line help on “config-e1” command usage in this node context

```
/cli/remote-eq/onu/e1> config-e1 ?

Usage:
 CONFIG-E1              Configure E1 interfaces for a given ONU.

 <MANDATORY>
 --ID                   Identifies a table entry by ID, in this context.
```

```
[OPTIONAL]
--admin          Administrative State. Enable/disable, in this context. (enable|disable)
--jitter         E1 timing configuration (dcr|re-timing|acr)
--loop           E1 loop configuration (no-loop|local|remote)
--monitor        E1 Frame (none|g.704|g.704-g.706)
--onuID          Identifies an ONU by ID, in this context.
--port           Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
--slot           Identifies a slot. (not used for LAG)
```

"config-lsp" command

Table 499. "config-lsp" command information

Name	config-lsp
Description	Configure LSP Ig/Eg paramters for a given ONU E1 interface.
Full path	/remote-eq/onu/e1/config-lsp
Mandatory Parameters	--ID --lsp-egress --lsp-ingress
Screen Output	No

Figure 599. CLI on line help on "config-lsp" command usage in this node context

```
/cli/remote-eq/onu/e1> config-lsp ?

Usage:
 CONFIG-LSP          Configure LSP Ig/Eg paramters for a given ONU E1 interface.

  <MANDATORY>
  --ID               Identifies a table entry by ID, in this context.
  --lsp-egress       Egress LSP label (16..1048575)
  --lsp-ingress      Ingress LSP label (16..1048575)

  [OPTIONAL]
  --onuID            Identifies an ONU by ID, in this context.
  --port             Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slot             Identifies a slot. (not used for LAG)
```

"config-pw" command

Table 500. "config-pw" command information

Name	config-lsp
Description	Configure Pseudowire Ig/Eg paramters for a given ONU E1 interface.
Full path	/remote-eq/onu/e1/config-pw
Mandatory Parameters	--ID
Screen Output	No

Figure 600. CLI on line help on "config-pw" command usage in this node context

```
/cli/remote-eq/onu/e1> config-pw ?

Usage:
 CONFIG-PW              Configure Pseudowire Ig/Eg paramters for a given ONU E1 interface.

 <MANDATORY>
 --ID                   Identifies a table entry by ID, in this context.

 [OPTIONAL]
 --onuID                Identifies an ONU by ID, in this context.
 --port                 Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
 --pw-egress            Egress pseudowire label (16..1048575)
 --pw-ingress           Ingress pseudowire label (16..1048575)
 --slot                 Identifies a slot. (not used for LAG)
```

"show" command

The show command used without parameters shows e1 information for the ONU specified with the command

/remote-eq/connect –onuID=xx --slot=yy –port=ccc.zz.

If there is no connected ONU, all the parameters must be specified to address the desired ONU otherwise the command will return an error message, Figure 595

Figure 601."show" command return error

```
/cli/remote-eq/onu/e1> show
No remote ONU specified.
/cli/remote-eq/onu/e1>
```

Table 501. "show" command information

Name	show

Description	Show the current configuration
Full path	/remote-eq/onu/e1/show
Mandatory Parameters	No
Screen Output	Table.

Figure 602. CLI on line help on "show" command usage in this node context

```
/cli/remote-eq/onu/e1> show ?

Usage:
  SHOW                  Show all the current E1 interfaces configuration for a given ONU.

  [OPTIONAL]
  --onuID               Identifies an ONU by ID, in this context.
  --port                Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slot                Identifies a slot. (not used for LAG)
```

"showconfig" command

Table 502. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/cli/remote-eq/onu/e1/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 603. CLI on line help on "showconfig" command usage in this node context

```
/cli/remote-eq/onu/e1> showconfig ?

Usage:
  SHOWCONFIG            Print the command list that enforces the current configuration

  [OPTIONAL]
  --onuID               Identifies an ONU by ID, in this context.
  --port                Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slot                Identifies a slot. (not used for LAG)
```

"status" command

The status command used without parameters shows e1interfaces status information for the ONU specified with the command

/remote-eq/connect –onuID=xx --slot=yy –port=ccc.zz.

If there is no connected ONU, all the parameters must be specified to address the desired ONU otherwise the command will return an error message, Figure 604

Figure 604."status" command return error

```
/cli/remote-eq/onu/e1> status
No remote ONU specified.
/cli/remote-eq/onu/e1>
```

Table 503. "status" command information

Name	status
Description	Show all the current E1 interfaces status for a given ONU.
Full path	/remote-eq/onu/e1/status
Mandatory Parameters	No
Screen Output	Table.

Figure 605. CLI on line help on "status" command usage in this node context

```
/cli/remote-eq/onu/e1> status ?

Usage:
  STATUS                Show all the current E1 interfaces status for a given ONU.

  [OPTIONAL]
  --onuID               Identifies an ONU by ID, in this context.
  --port                Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slot                Identifies a slot. (not used for LAG)
```

"ethernet" sub-node

"config" command

Table 504. "config" command information

Name	config
Description	Configures ethernet parameters for the specified ONU
Full path	/remote-eq/onu/ethernet/config
Mandatory Parameters	--ID
Screen Output	No

Figure 606. CLI on line help on "config" command usage in this node context

```
/cli/remote-eq/onu/ethernet> config ?

Usage:
 CONFIG        Configure

  <MANDATORY>
  --ID  Identifies a table entry by ID, in this context.

  [OPTIONAL]
  --admin   Administrative State. Enable/disable, in this context. (enable|disable)
  --media-type  Identifies the ethernet media type  (auto|10|100|1000 BaseT Full Duplex)
  --onuID   Identifies an ONU by ID, in this context.
  --port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot. (not used for LAG)
```

"show" command

Table 505. "show" command information

Name	show
Description	Show the current configuration
Full path	/ remote-eq/onu/ethernet/show
Mandatory Parameters	No
Screen Output	Table, Figure 608. Table parameters description in Table 506.

Figure 607. CLI on line help on "show" command usage in this node context

```
/cli/remote-eq/onu/ethernet> show ?

Usage:
 SHOW          Show the current configuration

  [OPTIONAL]
  --onuID   Identifies an ONU by ID, in this context.
  --port    Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot. (not used for LAG)
```

Figure 608.Output of "show" command in this node context

```
+-----------------------------------------------------------------------------------------+
|Ethernet Interfaces                                                                      |
+---+-------+------------------------------+--------------+--------------+--------------+
|ID |Admin  |Name                          |Media Type    |Flow Control  |Loop          |
+---+-------+------------------------------+--------------+--------------+--------------+
|0  |enable |Eth 1                         |auto          |Disabled      |none          |
+---+-------+------------------------------+--------------+--------------+--------------+
```

Table 506. "show" command output table parameters

Parameter	Description
ID	Identifies an interface by ID
Admin	Indicates interface administrative state
Name	Identifies an interface by name
Media Type	Indicates media type - Link Speed and Duplex (Autoneg,10BASE-T Full Duplex,100BASE-T Full Duplex,1000BASE-T Full Duplex)
Flow Control	Indicates if flow control (transmission and processing of Pause Frames) is enabled or disabled
Loop	Indicates if port loop is used

"ext-vlan-tag-op" sub-node

"config" command

Table 507. "config" command information

Name	config
Description	Configure the Extended VLAN Tagging Operation Global Attributes
Full path	/remote-eq/onu/ext-vlan-tag-op/config
Mandatory	--onu-port

Parameters	
Screen Output	No

Figure 609. CLI on line help on "config" command usage in this node context

```
/cli/remote-eq/onu/ext-vlan-tag-op> config ?

Usage:
 CONFIG                    Configure the Extended VLAN Tagging Operation Global
                           Attributes

  <MANDATORY>
  --onu-port               Identifies an interface on the ONU

  [OPTIONAL]
  --dscp-to-pbit-profile-id Specifies the profile for mapping DSCP to P bits
  --enable                 Enable/disable Extended VLAN Tagging operations on the
                           specified ONU port. (enable|disable)
  --input-tpid             Special TPID value for operations on the input (filtering) side of
                           the table in HEX format.
  --onuID                  Identifies an ONU by ID, in this context.
  --output-tpid            Special TPID value for operations on the output (tagging) side of
                           the table in HEX format.
  --port                   Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slot                   Identifies a slot. (not used for LAG)
```

"show" command

Table 508. "show" command information

Name	show
Description	Show Extended VLAN Tagging Operation information on this ONU
Full path	/ remote-eq/onu/ ext-vlan-tag-op/show
Mandatory Parameters	No
Screen Output	Table, Figure 611. Table parameters description in Table 509.

Figure 610. CLI on line help on "show" command usage in this node context

```
/cli/remote-eq/onu/ext-vlan-tag-op> show ?
```

```
Usage:
 SHOW                  Show Extended VLAN Tagging Operation information on this ONU.

 [OPTIONAL]
 --onuID               Identifies an ONU by ID, in this context.
 --port                Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
 --slot                Identifies a slot. (not used for LAG)
```

Figure 611.Output of "show" command in this node context

```
/cli/remote-eq/onu/ext-vlan-tag-op> show --onuID=2 --port=pon.1 --slot=3
+-------------------------------------------------------------------------------------+
|Extended VLAN Tagging Operation Config.
+----------+----------+------------------+------------------+--------------------------+
|ONU Port  |Enable    |Input TPID        |Output TPID       |(ID) DSCP to PBIT Profile
+----------+----------+------------------+------------------+--------------------------+
|Eth 1     |disable   |0X8100            |0X8100            |(7) DSCP 0-63 -> PCP 0
|Eth 2     |disable   |0X8100            |0X8100            |(7) DSCP 0-63 -> PCP 0
|Eth 3     |disable   |0X8100            |0X8100            |(7) DSCP 0-63 -> PCP 0
|Eth 4     |disable   |0X8100            |0X8100            |(7) DSCP 0-63 -> PCP 0
|VEIP 1    |disable   |0X8100            |0X8100            |(7) DSCP 0-63 -> PCP 0
+----------+----------+------------------+------------------+--------------------------+
```

Table 509. "show" command output table parameters

Parameter	Description
ONU Port	Identifies an ONU port by ID
Enable	Flag; indicates if the port is enabled.
Input TPID	Identifies input VLAN tag
Output TPID	Indicates output VLAN tag
(ID)	DSCP to PBIT profiule identifier (Number)
DSCP to PBIT profile	Indicates DSCP to PBIT profile bit mapping

"showconfig" command

Table 510. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/cli/remote-eq/onu/ext-vlan-tag-op/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

"operation-table" sub-node

"config" command

Table 511. "config" command information

Name	config
Description	Configure an Extended VLAN Tagging Operation Table entry
Full path	/remote-eq/onu/ext-vlan-tag-op/operation-table/config
Mandatory Parameters	--ID --onu-port
Screen Output	No

Figure 612. CLI on line help on "config" command usage in this node context

```
/cli/remote-eq/onu/ext-vlan-tag-op/operation-table> config ?

Usage:
  CONFIG                 Configure an Extended VLAN Tagging Operation Table entry

   <MANDATORY>
   --ID                 Identifies a table entry by ID, in this context.
   --onu-port             Identifies an interface on the ONU

   [OPTIONAL]
   --admin              Administrative State. Enable/disable, in this context. (enable|disable)
   --f-ethertype          Filter by ETHERTYPE (any|IPoE|PPPoE|ARP|IPv6_IPoE)
   --f-inner-priority       Filter by Inner Priority (0..7|any)
   --f-inner-tpid         Filter by Inner TPID (any|8100|input-dei-any|input-dei-0|input-dei-1)
   --f-inner-vid          Filter by Inner VID
   --onuID              Identifies an ONU by ID, in this context.
   --op-priority          Operation - Priority (0..7|copy|derive-from-dscp)
   --op-tpid            Operation - TPID (copy|output-dei-inner|0x8100|output-dei-0|output-dei-1)
   --op-vid             Operation - VID (add|remove)
   --port               Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
   --serviceID-onu          Choose a ONU service by ID.
   --slot               Identifies a slot. (not used for LAG)
```

"create" command

Table 512. "create" command information

Name	create
Description	Create an Extended VLAN Tagging Operation Table entry
Full path	/remote-eq/onu/ext-vlan-tag-op/operation-table/config
Mandatory Parameters	--onu-port --type
Screen Output	No

Figure 613. CLI on line help on "create" command usage in this node context

```
/cli/remote-eq/onu/ext-vlan-tag-op/operation-table> create ?

Usage:
  CREATE                 Create an Extended VLAN Tagging Operation Table entry

  <MANDATORY>
  --onu-port             Identifies an interface on the ONU
  --type                 Specifies the input frame type (untagged|single-tag)

  [OPTIONAL]
  --ID                   Identifies a table entry by ID, in this context.
  --admin                Administrative State. Enable/disable, in this context. (enable|disable)
  --f-ethertype          Filter by ETHERTYPE (any|IPoE|PPPoE|ARP|IPv6_IPoE)
  --f-inner-priority     Filter by Inner Priority (0..7|any)
  --f-inner-tpid         Filter by Inner TPID (any|8100|input-dei-any|input-dei-0|input-dei-1)
  --f-inner-vid          Filter by Inner VID
  --onuID                Identifies an ONU by ID, in this context.
  --op-priority          Operation - Priority (0..7|copy|derive-from-dscp)
  --op-tpid              Operation - TPID (copy|output-dei-inner|0x8100|output-dei-0|output-dei-1)
  --op-vid               Operation - VID (add|remove)
  --port                 Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --serviceID-onu        Choose a ONU service by ID.
  --slot                 Identifies a slot. (not used for LAG)
```

"remove" command

Table 513. "remove" command information

Name	remove
Description	Remove an Extended VLAN Tagging Operation Table entry
Full path	/remote-eq/onu/ext-vlan-tag-op/operation-table/remove
Mandatory Parameters	--ID --onu-port
Screen Output	No

Figure 614. CLI on line help on "remove" command usage in this node context

```
/cli/remote-eq/onu/ext-vlan-tag-op/operation-table> remove ?

Usage:
  REMOVE                  Remove an Extended VLAN Tagging Operation Table entry

   <MANDATORY>
   --ID                  Identifies a table entry by ID, in this context.
   --onu-port              Identifies an interface on the ONU

   [OPTIONAL]
   --onuID                 Identifies an ONU by ID, in this context.
   --port                Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
   --slot                Identifies a slot. (not used for LAG)
```

"show" command

Table 514. "show" command information

Name	show
Description	Show the Extended VLAN Tagging Operation Table on this ONU.
Full path	/remote-eq/onu/ext-vlan-tag-op/operation-table/show
Mandatory Parameters	This command has no parameters
Screen Output	Table Figure 616.Table parameters description Table 515

Figure 615. CLI on line help on "show" command usage in this node context

```
/cli/remote-eq/onu/ext-vlan-tag-op/operation-table> show ?

Usage:
  SHOW                    Show the Extended VLAN Tagging Operation Table on this ONU.

  [OPTIONAL]
  --onuID                  Identifies an ONU by ID, in this context.
  --port                  Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slot                  Identifies a slot. (not used for LAG)
```

Figure 616.Output of "show" command in this node context"

```
/cli/remote-eq/onu/ext-vlan-tag-op/operation-table> show --onuID=2 --port=pon.1 --slot=3
+-------------------------------------------------------------------------------------------------------------------------------------------------------+
|Extended VLAN Tagging Operation Table                                                                                                                  |
+--------------------+-----------------------------------------+-----------------------------------------------------------------------------------------+
|                    |Filter                                   |Treatment                                                                                |
+--------+--+--------+-+--------------+--------------+---------+---------+-------------------------------+---------------+---------------+
|ONU Port|ID|Admin   |T|Inner Pri/VID  |Inn. TPID     |ETHTYPE  |Operation|(ID) Service                   |Priority       |TPID           |
+--------+--+--------+-+--------------+--------------+---------+---------+-------------------------------+---------------+---------------+
+--------+--+--------+-+--------------+--------------+---------+---------+-------------------------------+---------------+---------------+
```

Table 515. "show" command output table parameters

Parameter Group	Parameter	Description
	ONU Port	ONU Port Identifier
	ID	Table entry numeric Identifier
	Admin	Indicates upstream profile administrative state
	T	
Filter	Inner Pri/VID	Indicates Priotity/VID
	Inner TPID	Indicates Inner TPID
	Ethertype	Indicates ETHERTYPE
Treatment	Operation	Indicates Operation
	(ID) Service	Indicates service by ID (number and Name Identifier
	Priority	Indicates Priority
	TPID	Indicates TPID

"showconfig" command

Table 516. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/remote-eq/onu/ext-vlan-tag-op/operation-table/showconfig
Mandatory Parameters	No
Screen Output	Full command(s) path and used arguments and values to reach

	the current configuration.

Figure 617. CLI on line help on "showconfig" command usage in this node context

```
/cli/remote-eq/onu/ext-vlan-tag-op/operation-table> showconfig ?

Usage:
 SHOWCONFIG              Print the command list that enforces the current configuration

  [OPTIONAL]
  --onuID                 Identifies an ONU by ID, in this context.
  --port                  Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slot                  Identifies a slot. (not used for LAG)
```

"ptp-source" sub-node

"availableValues" command

Table 517. "availableValues " command information

Name	availableValues
Description	Show the available values for argument 'add-onu-port'.
Full path	/remote-eq/onu/ptp-source/availableValues
Mandatory Parameters	No
Screen Output	Table

Figure 618. CLI on line help on "availableValues" command usage in this node context

```
/cli/remote-eq/onu/ptp-source> availableValues ?

Usage:
 AVAILABLEVALUES Show the available values for argument 'add-onu-port'.

  [OPTIONAL]
  --onuID   Identifies an ONU by ID, in this context.
  --port    Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot. (not used for LAG)
```

"config" command

Table 518. "config" command information

Name	config
Description	Configure one ONU PTP source instance parameters.
Full path	/remote-eq/onu/ptp-source/config
Mandatory Parameters	--olt-ptp-port-ID
Screen Output	No

Figure 619. CLI on line help on "config" command usage in this node context

```
/cli/remote-eq/onu/ptp-source> config ?

Usage:
 CONFIG        Configure one ONU PTP source instance parameters.

  <MANDATORY>
  --olt-ptp-port-ID   Identify one OLT PTP port instance by ID.

  [OPTIONAL]
  --add-onu-port      Attach an ONU interface to an ONU service. See available values by
   executing the command 'availableValues'.
  --admin   Administrative State. Enable/disable, in this context. (enable|disable)
  --onuID   Identifies an ONU by ID, in this context.
  --port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot. (not used for LAG)
  --uni-ctag      VLAN ID delivered/received from the (Ethernet) subscriber-facing
   interface at the ONU. (1..4094)
```

"create" command

Table 519. "create" command information

Name	create
Description	Create a new PTP source instance on a given ONU, and associate it with an existing OLT PTP port.
Full path	/remote-eq/onu/ptp-source/create
Mandatory Parameters	--olt-ptp-port-ID
Screen Output	No

Figure 620. CLI on line help on "create" command usage in this node context

```
/cli/remote-eq/onu/ptp-source> create ?

Usage:
  CREATE          Create a new PTP source instance on a given ONU, and associate it with
an existing OLT PTP port.

  <MANDATORY>
  --olt-ptp-port-ID    Identify one OLT PTP port instance by ID.

  [OPTIONAL]
  --add-onu-port       Attach an ONU interface to an ONU service. See available values by
   executing the command 'availableValues'.
  --admin    Administrative State. Enable/disable, in this context. (enable|disable)
  --onuID    Identifies an ONU by ID, in this context.
  --port       Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot. (not used for LAG)
  --uni-ctag      VLAN ID delivered/received from the (Ethernet) subscriber-facing
interface     at the ONU. (1..4094)
```

"remove" command

Table 520. "remove" command information

Name	remove
Description	Remove an ONU PTP source instance on a given ONU
Full path	/profiles/ voip/server/remove
Mandatory Parameters	--olt-ptp-port-ID
Screen Output	No

Figure 621. CLI on line help on "remove" command usage in this node context

```
/cli/remote-eq/onu/ptp-source> remove ?

Usage:
  REMOVE          Remove

  <MANDATORY>
```

```
--olt-ptp-port-ID    Identify one OLT PTP port instance by ID.
```

"show" command

Table 521. "show" command information

Name	show
Description	Show PTP source instances on this ONU.
Full path	/remote-eq/onu/ptp-source/show
Mandatory Parameters	This command has no parameters
Screen Output	Table.

Figure 622. CLI on line help on "show" command usage in this node context

```
/cli/remote-eq/onu/ptp-source> show ?

Usage:
  SHOW          Show PTP source instances on this ONU.
```

"services" sub-node

"add" command

Table 522. "add " command information

Name	add
Description	Add an OLT service to a specific ONU.
Full path	/remote-eq/onu/services/add
Mandatory Parameters	--add-onu-port --name --serviceID
Screen Output	No

Figure 623. CLI on line help on "add" command usage in this node context

```
/cli/remote-eq/onu/services> add ?

Usage:
  ADD           Add an OLT service to a specific ONU.

  <MANDATORY>
  --add-onu-port      Attach an ONU interface to an ONU service. See available values by
```

executing the command 'availableValues'.

--name Insert a name STRING.

--serviceID Select an OLT service by ID.

[OPTIONAL]

--dhcp-op18 DHCP Op.18 flag

--dhcp-op37 DHCP Op.37 flag

--dhcp-op82 DHCP Op.82 flag

--encryption Enable or disable encryption.

--ethernet-profileID View available Ethernet profile IDs in /profiles/ethernet (use zero for no profile)

--ip-mgmt If enabled, use this service for IP management of the ONU (enable|disable)

--nativeVlan All traffic through the client port port will be untagged, upstream and downstream. (enable|disable)

--nni-ctag Inner VLAN ID (client) on the network-facing (Ethernet) interface. (1..4094)

--onuID Identifies an ONU by ID, in this context.

--port Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)

--remoteID Remote ID field added to DHCP packets in DHCPop.82 enabled services.

--slotIdentifies a slot. (not used for LAG)

--uni-ctag VLAN ID delivered/received from the (Ethernet) subscriber-facing interface at the ONU. (1..4094)

--upstream-profileID (mandatory for non-multicast services) View available Upstream profile IDs in /profiles/upstream

--use-global-dhcp-ops Use the DHCP options defined in the OLT global service. (enable|disable)

"availableValues" command

Table 523. "availableValues " command information

Name	availableValues
Description	Show the available values for argument 'remote-port'
Full path	/remote-eq/onu/services/availableValues
Mandatory Parameters	No
Screen Output	Table Figure 625.Table parameters description Table 524

Figure 624. CLI on line help on "availableValues" command usage in this node context

```
/cli/remote-eq/onu/services> availableValues ?

Usage:
 AVAILABLEVALUES Show the available values for argument 'remote-port'.

  [OPTIONAL]
  --onuID   Identifies an ONU by ID, in this context.
  --port    Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot. (not used for LAG)
```

Figure 625.Output of "availableValues" command in this node context

```
Available Values for arguments 'add-onu-port and 'del-onu-port':
+-------------------------+
|Remote ONU Interface List|
+-------------------------+
|Eth 1                    |
+-------------------------+
```

Table 524. "availableValues" command output table parameters

Parameter	Description
Remote ONU Interface List	Lists the available interfaces on the Remote ONU

"config" command

Table 525. "config" command information

Name	config
Description	Configure/activate an existing service on this ONU.
Full path	/remote-eq/onu/services/config
Mandatory Parameters	--serviceID-onu
Screen Output	No

Figure 626. CLI on line help on "config" command usage in this node context

```
/cli/remote-eq/onu/services> config ?

Usage:
```

CONFIG Configure/activate an existing service on this ONU.

<MANDATORY>

--serviceID-onu Choose a ONU service by ID.

[OPTIONAL]

--add-onu-portAttach an ONU interface to an ONU service. See available values by executing the command 'availableValues'.

--admin Administrative State. Enable/disable, in this context. (enable|disable)

--del-onu-port Remove an ONU interface from an ONU service. See available values by executing the command 'availableValues'.

--dhcp-op18 DHCP Op.18 flag

--dhcp-op37 DHCP Op.37 flag

--dhcp-op82 DHCP Op.82 flag

--encryption Enable or disable encryption.

--ethernet-profileID View available Ethernet profile IDs in /profiles/ethernet (use zero for no profile)

--ip-mgmtIf enabled, use this service for IP management of the ONU (enable|disable)

--name Insert a name STRING.

--nativeVlan All traffic through the client port port will be untagged, upstream and downstream. (enable|disable)

--nni-ctag Inner VLAN ID (client) on the network-facing (Ethernet) interface. (1..4094)

--onuID Identifies an ONU by ID, in this context.

--portIdentifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)

--remoteID Remote ID field added to DHCP packets in DHCPop.82 enabled services.

--serviceID Select an OLT service by ID.

--slot Identifies a slot. (not used for LAG)

--uni-ctag VLAN ID delivered/received from the (Ethernet) subscriber-facing interface at the ONU. (1..4094)

--upstream-profileID (mandatory for non-multicast services) View available Upstream profile IDs in /profiles/upstream

--use-global-dhcp-ops Use the DHCP options defined in the OLT global service. (enable|disable)

"remove" command

Table 526. "remove" command information

Name	remove
Description	Remove a service from a specific ONU.

Full path	/remote-eq/onu/services/remove
Mandatory Parameters	--serviceID-onu
Screen Output	No

Figure 627. CLI on line help on "remove" command usage in this node context

```
/cli/remote-eq/onu/services> remove ?

Usage:
 REMOVE        Remove a service from a specific ONU.

  <MANDATORY>
  --serviceID-onu     Choose a ONU service by ID.

  [OPTIONAL]
  --onuID   Identifies an ONU by ID, in this context.
  --port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot. (not used for LAG)
```

"show" command

Table 527. "show" command information

Name	show
Description	Show Services information on this ONU. Give a service ID to see the full information for that service.
Full path	/remote-eq/onu/services/show
Mandatory Parameters	No
Screen Output	Tables Figure 629 and Figure 630.Tables parameters description in Table 528

Figure 628. CLI on line help on "show" command usage in this node context

```
/cli/remote-eq/onu/services> show ?

Usage:
 SHOW          Show Services information on this ONU. Give a service ID to see the full
information for that service.

  [OPTIONAL]
```

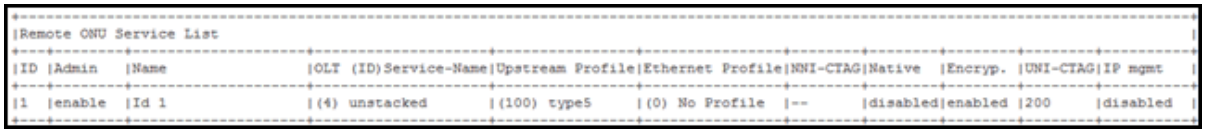
--onuID Identifies an ONU by ID, in this context.

--port Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)

--serviceID-onu Choose a ONU service by ID.

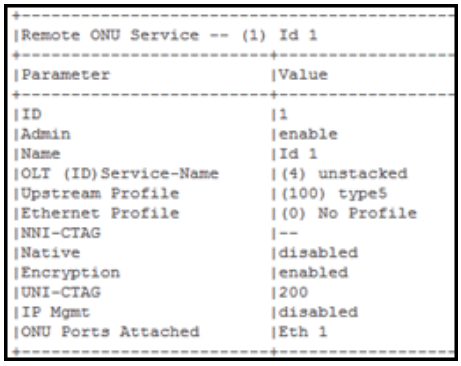
--slotIdentifies a slot. (not used for LAG).

Figure 629.Output of "show" command in this node context



```
+-----------------------------------------------------------------------------------------------------------------------+
|Remote ONU Service List                                                                                                |
+---+--------+-------------------+-----------------+----------------+----------------+--------+--------+--------+-------+
|ID |Admin   |Name               |OLT (ID)Service-Name|Upstream Profile|Ethernet Profile|NNI-CTAG|Native  |Encryp. |UNI-CTAG|IP mgmt   |
+---+--------+-------------------+-----------------+----------------+----------------+--------+--------+--------+-------+
|1  |enable  |Id 1               |(4) unstacked    |(100) type5     |(0) No Profile  |--      |disabled|enabled |200     |disabled  |
+---+--------+-------------------+-----------------+----------------+----------------+--------+--------+--------+-------+
```

Figure 630.Output of "show" command with argument –serviceID-onu in this node context



```
+-------------------------------------------+
|Remote ONU Service -- (1) Id 1             |
+-------------------------+-----------------+
|Parameter                |Value            |
+-------------------------+-----------------+
|ID                       |1                |
|Admin                    |enable           |
|Name                     |Id 1             |
|OLT (ID)Service-Name     |(4) unstacked    |
|Upstream Profile         |(100) type5      |
|Ethernet Profile         |(0) No Profile   |
|NNI-CTAG                 |--               |
|Native                   |disabled         |
|Encryption               |enabled          |
|UNI-CTAG                 |200              |
|IP Mgmt                  |disabled         |
|ONU Ports Attached       |Eth 1            |
+-------------------------+-----------------+
```

Table 528. "show" command output table parameters

Parameter	Description
ID	Identifies a table entry(Service) by ID
Admin	Indicates ONU service administrative state
Name	Identifies ONU service by name
OLT (ID) Service-Name	Identifies an OLT service by ID and Name
Upstream Profile	Indicates the upstream profile associated to the service by ID and name
Ethernet Profile	Indicates the Ethernet profile associated to the service by ID and name
NNI-CTAG	Identicates the client vlan used in the service
Native	Indicates if the Native service is active. It's only possible to have a Native service by ONU port. In case this service is untagged in the client port, this option must be active.
Encryp.	Indicates if the encryptation is enabled
UNI-CTAG	Indicates the vlan delivered/received to/from the ONU
IP mgmt	Indicates if IP management is enabled

"t-cont-mapping" sub-node

"config" command

Table 529. "config" command information

Name	config
Description	Configure an association of a specific PCP priority from a service to a T-CON
Full path	/remote-eq/onu/services/t-cont-mapping/config
Mandatory Parameters	--priority --serviceID-onu
Screen Output	No

Figure 631. CLI on line help on "config" command usage in this node context

```
/cli/remote-eq/onu/services/t-cont-mapping> config ?

Usage:
 CONFIG          Configure an association of a specific PCP priority from a service to a T-CONT

  <MANDATORY>
  --priority              Specify the priority (0..7)
  --serviceID-onu         Choose a ONU service by ID.

  [OPTIONAL]
  --onuID                 Identifies an ONU by ID, in this context.
  --port                  Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slot                  Identifies a slot. (not used for LAG)
  --t-cont-id             Specify an existing T-CONT (0 for none)
```

"show" command

Table 530. "show" command information

Name	show
Description	Show T-CONT information on this ONU
Full path	/ remote-eq/onu/ ext-vlan-tag-op/show
Mandatory Parameters	No
Screen Output	Table, Figure 633. Table parameters description in Table 531.

Figure 632. CLI on line help on "show" command usage in this node context

```
/cli/remote-eq/onu/services/t-cont-mapping> show ?

Usage:
 SHOW                    Show T-CONT information on this ONU.

  [OPTIONAL]
  --onuID                 Identifies an ONU by ID, in this context.
  --port                  Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --serviceID-onu         Choose a ONU service by ID.
  --slot                  Identifies a slot. (not used for LAG)
```

Figure 633.Output of "show" command in this node context

```
/cli/remote-eq/onu/services/t-cont-mapping> show --onuID=2 --port=pon.1 --slot=3
+-------------------------------------------------------+
|ONU Service to T-CONT associations                     |
+---------------------------------------+---------+-----+
|ONU Service ID                         |Priority |T-CONT |
+---------------------------------------+---------+-----+
+---------------------------------------+---------+-----+
```

Table 531. "show" command output table parameters

Parameter	Description
ONU Service ID	Identifies an ONU Service by ID
Priority	Indicates Service Priority
T-CONT	Indicates used T-CONT

"showconfig" command

Table 532. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/remote-eq/onu/services/t-cont-mapping/showconfig
Mandatory Parameters	No
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 634. CLI on line help on "showconfig" command usage in this node context

```
/cli/remote-eq/onu/services/t-cont-mapping> showconfig ?

Usage:
 SHOWCONFIG              Print the command list that enforces the current configuration

 [OPTIONAL]
 --onuID                 Identifies an ONU by ID, in this context.
 --port                  Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
 --slot                  Identifies a slot. (not used for LAG)
```

"system" sub-node

"config" command

Table 533. "config" command information

Name	config
Description	Configures system information for the specified ONU
Full path	/ remote-eq/onu/system/config
Mandatory Parameters	No
Screen Output	No

Figure 635. CLI on line help on "config" command usage in this node context

```
/cli/remote-eq/onu/system> config ?

Usage:
 CONFIG        Configure

 [OPTIONAL]
 --contact  Set contact information as appropriate
 --description   Set a description, in this context.
 --locationSet the system location as appropriate
 --name     Insert a name STRING.
 --onuID    Identifies an ONU by ID, in this context.
 --port     Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
```

```
--slotIdentifies a slot. (not used for LAG)
```

"show" command

Table 534. "show" command information

Name	show
Description	Show the current configuration
Full path	/ remote-eq/onu/system/show
Mandatory Parameters	No
Screen Output	Table, Figure 637. Table parameters description in Table 535.

Figure 636. CLI on line help on "show" command usage in this node context

```
/cli/remote-eq/onu/system> show ?

Usage:
 SHOW          Show the current configuration

  [OPTIONAL]
  --onuID   Identifies an ONU by ID, in this context.
  --port    Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot. (not used for LAG)
```

Figure 637.Output of "show" command in this node context

```
+-----------------------------------------------------------------+
|System Parameters                                                |
+-------------------------+---------------------------------------+
|Parameter                |Value                                  |
+-------------------------+---------------------------------------+
|Equipment Name           |ONT 12.16.2                            |
|Description              |ONT 12.16.2                            |
|Serial Number            |5054494E393A074D                       |
|Contact                  |                                       |
|Location                 |                                       |
+-------------------------+---------------------------------------+
|Date on equipment        |2013/04/17                             |
|Time on equipment        |16:33:54                               |
+-------------------------+---------------------------------------+
|HW Version               |ONT7SFUV000006                         |
|Administrative Status    |Not registered                         |
+-------------------------+---------------------------------------+
```

Table 535. "show" command output table parameters

Parameter	Description
Equipment Name	Indicates the equipment name

Description	Brief description of the equipment
Serial Number	Indicates the ONU serial number
Contact	Indicates the entity responsible for this equipment
Location	Indicates the equipment location
Date on equipment	Indicates the date on the equipment
Time on the equipment	Indicates the time on the equipment
HW Version	Indicates the equipment hardware version
Administrative Status	Indicates the equipment administrative state

"t-cont" sub-node

"config" command

Table 536. "config" command information

Name	config
Description	Configure/activate an existing T-CONT on this ONU.
Full path	/remote-eq/onu/t-cont/config
Mandatory Parameters	--ID
Screen Output	No

Figure 638. CLI on line help on "config" command usage in this node context

```
/cli/remote-eq/onu/t-cont> config ?

Usage:
 CONFIG                 Configure/activate an existing T-CONT on this ONU.

  <MANDATORY>
  --ID                  Identifies a table entry by ID, in this context.

  [OPTIONAL]
  --admin               Administrative State. Enable/disable, in this context. (enable|disable)
  --onuID               Identifies an ONU by ID, in this context.
  --port                Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slot                Identifies a slot. (not used for LAG)
  --upstream-profileID          View available Upstream profile IDs in /profiles/upstream
```

"create" command

Table 537. "create" command information

Name	create
Description	Add a T-CONT to a specific ONU.
Full path	/remote-eq/onu/t-cont/create
Mandatory Parameters	No
Screen Output	No

Figure 639. CLI on line help on "create" command usage in this node context

```
/cli/remote-eq/onu/t-cont> create ?

Usage:
  CREATE                    Add a T-CONT to a specific ONU.

  [OPTIONAL]
  --ID                    Identifies a table entry by ID, in this context.
  --admin                   Administrative State. Enable/disable, in this context. (enable|disable)
  --onuID                   Identifies an ONU by ID, in this context.
  --port                  Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slot                  Identifies a slot. (not used for LAG)
  --upstream-profileID          View available Upstream profile IDs in /profiles/upstream
```

"remove" command

Table 538. "remove" command information

Name	remove
Description	Remove a T-CONT from a specific ONU.
Full path	/remote-eq/onu/t-cont/remove
Mandatory Parameters	No
Screen Output	No

Figure 640. CLI on line help on "remove" command usage in this node context

```
/cli/remote-eq/onu/t-cont> remove ?

Usage:
  REMOVE                    Remove a T-CONT from a specific ONU.
```

```
[OPTIONAL]
--ID                Identifies a table entry by ID, in this context.
--onuID             Identifies an ONU by ID, in this context.
--port              Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
--slot              Identifies a slot. (not used for LAG)
```

"show" command

Table 539. "show" command information

Name	show
Description	Show T-CONT information on this ONU.
Full path	/remote-eq/onu/t-cont/show
Mandatory Parameters	No
Screen Output	Table Figure 642.Table parameters description Table 540

Figure 641. CLI on line help on "show" command usage in this node context

```
/cli/remote-eq/onu/t-cont> show ?

Usage:
  SHOW              Show T-CONT information on this ONU.

  [OPTIONAL]
  --onuID           Identifies an ONU by ID, in this context.
  --port            Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slot            Identifies a slot. (not used for LAG)
```

Figure 642.Output of "show" command in this node context"

```
/cli/remote-eq/onu/t-cont> show --onuID=2 --port=pon.1 --slot=3
+---------------------------------+
|ONU T-CONT List                  |
+---+---------+-----------------+
|ID |Admin    |Upstream Profile |
+---+---------+-----------------+
```

Table 540. "show" command output table parameters

Parameter	Description
ID	Table entry numeric Identifier

Admin	Indicates administrative state
Upstream profile	Indicates upstream profile

"showconfig" command

Table 541. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/remote-eq/onu/t-cont/showconfig
Mandatory Parameters	No
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 643. CLI on line help on "showconfig" command usage in this node context

```
/cli/remote-eq/onu/t-cont> showconfig ?

Usage:
  SHOWCONFIG                Print the command list that enforces the current configuration

  [OPTIONAL]
  --onuID                   Identifies an ONU by ID, in this context.
  --port                    Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slot                    Identifies a slot. (not used for LAG)
```

"voip" sub-node

"config" command

Table 542. "config" command information

Name	config
Description	Configure a remote ONU VoIP interface
Full path	/ remote-eq/onu/voip/config
Mandatory Parameters	--onu-voip-port
Screen Output	No

Figure 644. CLI on line help on "config" command usage in this node context

```
/cli/remote-eq/onu/voip> config ?

Usage:
 CONFIG        Configure a remote ONU VoIP interface

  <MANDATORY>
  --onu-voip-port     Identifies the VoIP port to be configured. (e.g voip.1)

  [OPTIONAL]
  --admin   Administrative State. Enable/disable, in this context. (enable|disable)
  --client-ip      VoIP client IP address. If the value is 0.0.0.0, the IP address will be
   obtained by DHCP.
  --ftp-passwd  User password to login in the FTP server to get the XML file with the
   VoIP client configuration
  --ftp-username      User name to login in the FTP server to get the XML file with the
VoIP   client configuration
  --hold-over-time   Time during which POTS loop voltage is held up when the ONU is
not      ranged on the GPON.
  --ip-maskIP Network Mask.
  --onuID   Identifies an ONU by ID, in this context.
  --port       Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --remote-file  This is the .xml file that contains the client configuration (ex.supported
   codecs, number, etc)
  --rx-gain  Specifies the receiver gain (dB) (-12..6)
  --slotIdentifies a slot. (not used for LAG)
  --specific-profile  Identifies a VoIP specific profile by ID (manage profiles in
   '/profiles/voip/specific-profiles/' node)
  --termination-id     Used for MEGACO(H.248) to identify the line termination
  --tx-gain  Specifies the transmitter gain (dB) (-12..6)
  --voip-profile Identifies a VoIP profile by ID (manage profiles in '/profiles/voip/' node)
```

"show" command

Table 543. "show" command information

Name	show
Description	Show the current configuration
Full path	/ remote-eq/onu/voip/show

Mandatory Parameters	No
Screen Output	Table

Figure 645. CLI on line help on "show" command usage in this node context

```
/cli/remote-eq/onu/voip> show ?

Usage:
 SHOW          Show the current VoIP interface configuration.

  [OPTIONAL]
  --onu-voip-port     Identifies the VoIP port to be configured. (e.g voip.1)
  --onuID   Identifies an ONU by ID, in this context.
  --port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot. (not used for LAG)
```

"statistics" sub-node

"fec" sub-node

"show" command

Table 544. "show" command information

Name	show
Description	Show FEC statistics in the upstream direction
Full path	/remote-eq/statistics/fec/show
Mandatory Parameters	No
Screen Output	Table.

Figure 646. CLI on line help on "show" command usage in this node context

```
/cli/remote-eq/statistics/fec> show ?

Usage:
 SHOW          Show FEC statistics in the upstream direction

  [OPTIONAL]
  --onuID   Identifies an ONU by ID, in this context.
```

```
--port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
--slotIdentifies a slot. (not used for LAG)
```

“status” sub-node

“show” command

This command displays status information on all the parameters for the specified ONU:

- Ethernet Status Table
- Analog RF Status Table
- GPON Status Table
- Service Status Table
- Firmware Status Table

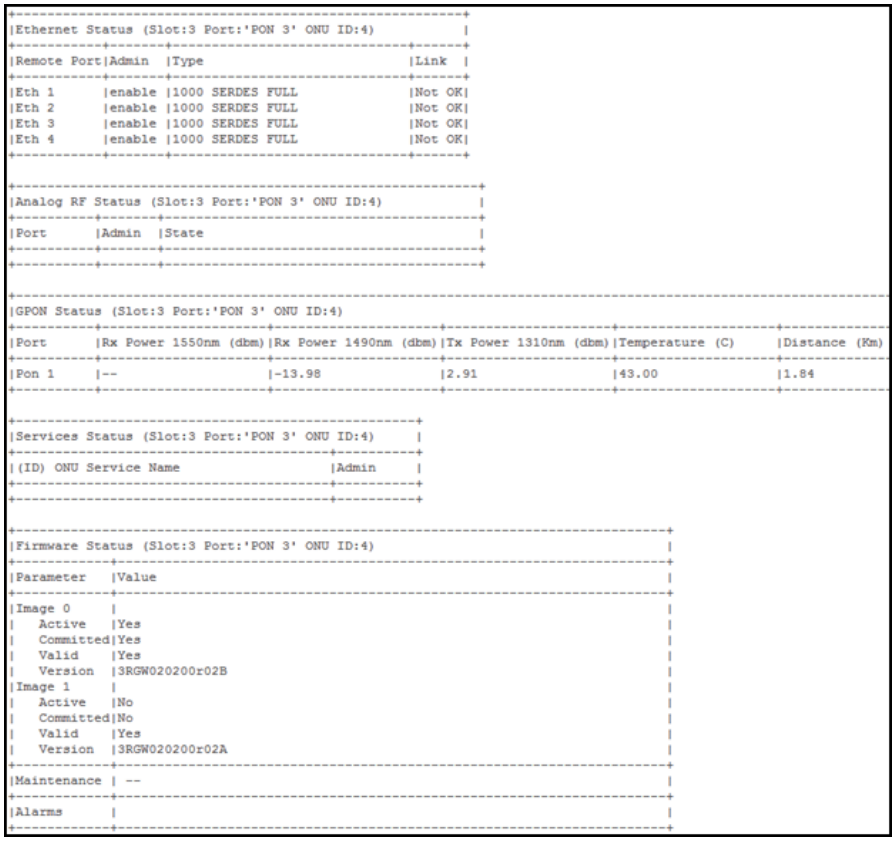
Table 545. "show" command information

Name	show
Description	Show status information on all the parameters for the specified ONU
Full path	/remote-eq/status/show
Mandatory Parameters	No
Screen Output	Tables, Figure 648. Tables parameters description in Table 546 to Table 551.

Figure 647. CLI on line help on “show” command usage in this node context

```
/cli/remote-eq/status> show ?

Usage:
 SHOW          Show

  [OPTIONAL]
  --onuID   Identifies an ONU by ID, in this context.
  --port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot. (not used for LAG)
```

Figure 648.Output of ”show” command in this node context



```
+-----------------------------------------------------------+
|Ethernet Status (Slot:3 Port:'PON 3' ONU ID:4)             |
+-----------+-------+-------------------------------+------+
|Remote Port|Admin  |Type                           |Link  |
+-----------+-------+-------------------------------+------+
|Eth 1      |enable |1000 SERDES FULL               |Not OK|
|Eth 2      |enable |1000 SERDES FULL               |Not OK|
|Eth 3      |enable |1000 SERDES FULL               |Not OK|
|Eth 4      |enable |1000 SERDES FULL               |Not OK|
+-----------+-------+-------------------------------+------+

+-----------------------------------------------------+
|Analog RF Status (Slot:3 Port:'PON 3' ONU ID:4)      |
+----------+-------+------------------------------------+
|Port      |Admin  |State                               |
+----------+-------+------------------------------------+
+----------+-------+------------------------------------+

+-----------------------------------------------------------------------------------------------------------------------+
|GPON Status (Slot:3 Port:'PON 3' ONU ID:4)
+----------+-----------------------+-----------------------+-----------------------+-----------------------+---------+
|Port      |Rx Power 1550nm (dbm)|Rx Power 1490nm (dbm)|Tx Power 1310nm (dbm)|Temperature (C)      |Distance (Km)
+----------+-----------------------+-----------------------+-----------------------+-----------------------+---------+
|Pon 1     |--                     |-13.98                 |2.91                   |43.00                  |1.84
+----------+-----------------------+-----------------------+-----------------------+-----------------------+---------+

+-----------------------------------------------+
|Services Status (Slot:3 Port:'PON 3' ONU ID:4) |
+-----------------------------------------+-----+
|(ID) ONU Service Name                    |Admin|
+-----------------------------------------+-----+
+-----------------------------------------+-----+

+-----------------------------------------------------------------------------------+
|Firmware Status (Slot:3 Port:'PON 3' ONU ID:4)                                     |
+-----------+-----------------------------------------------------------------------+
|Parameter  |Value                                                                  |
+-----------+-----------------------------------------------------------------------+
|Image 0    |                                                                       |
|   Active  |Yes                                                                    |
|   Committed|Yes                                                                   |
|   Valid   |Yes                                                                    |
|   Version |3RGW020200r02B                                                         |
|Image 1    |                                                                       |
|   Active  |No                                                                     |
|   Committed|No                                                                    |
|   Valid   |Yes                                                                    |
|   Version |3RGW020200r02A                                                         |
+-----------+-----------------------------------------------------------------------+
|Maintenance | --                                                                   |
+-----------+-----------------------------------------------------------------------+
|Alarms     |                                                                       |
+-----------+-----------------------------------------------------------------------+
```

Table 546. “show” command output table parameters –Ethernet Status table

Parameter	Description
Remote Port	Indicates the Ethernet port at the ONU
Admin	Indicates the Administrative state
Type	Indicates the link speed and duplex
Link	Indicates the physical port state.

Table 547. “show” command output tables parameters –Analog RF Status table

Parameter	Description
Port	Indicates the ONU Analog RF port
Admin	Indicates the administrative state
State	Indicates the port operational state

Table 548. “show” command output tables parameters –GPON Status table

Parameter	Description
Port	Indicates the ONU GPON port
Rx Power 1550nm (dBm)	Indicates the 1550 nm Received Optical Power in dBm
Tx Power 1490nm (dBm)	Indicates the 1490 nm Received Optical Power in dBm

Tx Power 1310nm (dBm)	Indicates the 1310 nm Transmitted Optical Power in dBm
Temperature (ºC)	Indicates the ONU Temperature in ºC
Distance (km)	Indicates the ONU distance in km

Table 549. "show" command output tables parameters –Services Status table

Parameter	Description
(ID) ONU Service Name	Indicates the ONU service by ID and name
Admin	Indicates the ONU service administrative state

Table 550. "show" command output tables parameters –Firmware Status table

Parameter	Description
Image 0/1	Indicates the Image name
Active	Indicates which of the images is active
Committed	Indicates which of the images is active after a reboot
Valid	Indicates if the SW/FW version is Valid
Version	Indicates the SW/FW version name

Table 551. "show" command output tables parameters –Maintenance and Alarms status

Parameter	Description
Maintenance	Indicates if ONU is in maintenace
Alarms	Indicates alarms if existing

"ethernet" sub-node

"statistics" sub-node

"show" command

Table 552. "show" command information

Name	show
Description	Show ethernet statistics
Full path	/remote-eq/status/ethernet/statistics/show
Mandatory Parameters	--remote-port
Screen Output	Table, Figure 650. Table parameters description in Table 553

Figure 649. CLI on line help on "show" command usage in this node context

```
/cli/remote-eq/status/ethernet/statistics> show ?

Usage:
```

SHOW Show ethernet statistics

<MANDATORY>

--remote-port Identifies an interface on a remote device.

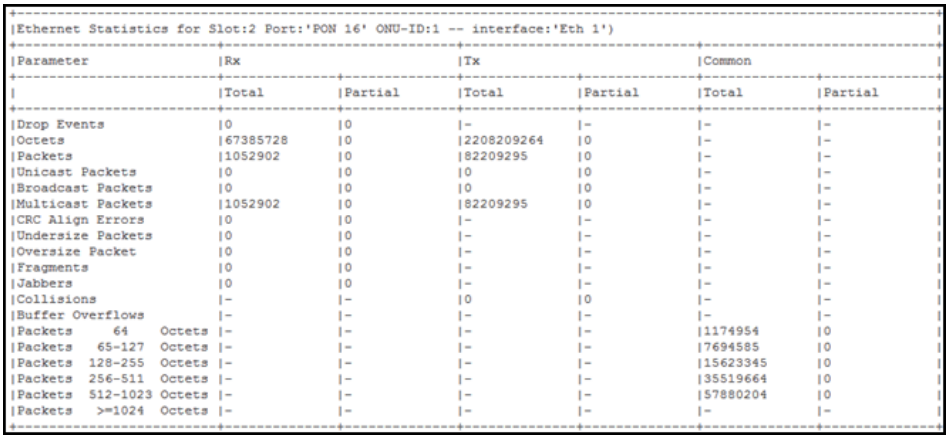
[OPTIONAL]

--onuID Identifies an ONU by ID, in this context.

--port Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)

--slotIdentifies a slot. (not used for LAG)

Figure 650.Output of "show" command in this node context



|Ethernet Statistics for Slot:2 Port:'PON 16' ONU-ID:1 -- interface:'Eth 1')

Parameter	Rx		Tx		Common	
	Total	Partial	Total	Partial	Total	Partial
Drop Events	0	0	-	-	-	-
Octets	67385728	0	2208209264	0	-	-
Packets	1052902	0	82209295	0	-	-
Unicast Packets	0	0	0	0	-	-
Broadcast Packets	0	0	0	0	-	-
Multicast Packets	1052902	0	82209295	0	-	-
CRC Align Errors	0	0	-	-	-	-
Undersize Packets	0	0	-	-	-	-
Oversize Packet	0	0	-	-	-	-
Fragments	0	0	-	-	-	-
Jabbers	0	0	-	-	-	-
Collisions	-	-	0	0	-	-
Buffer Overflows	-	-	-	-	-	-
Packets 64 Octets	-	-	-	-	1174954	0
Packets 65-127 Octets	-	-	-	-	7694585	0
Packets 128-255 Octets	-	-	-	-	15623345	0
Packets 256-511 Octets	-	-	-	-	35519664	0
Packets 512-1023 Octets	-	-	-	-	57880204	0
Packets >=1024 Octets	-	-	-	-	-	-

Table 553. "show" command output table parameters

Parameter	Description
Rx Total & Partial	Received total & partial counters
Tx Total & Partial	Transmitted total & partial counters
Drop Events	Number of dropped packets
Octets	Number of bytes
Packets	Number of Packets
Unicast Packets	Number of Unicast Packets
Broadcast Packets	Number of Broadcast Packets
Multicast Packets	Number of Multicast Packets
CRC Align Errors	Number of packets with wrong FCS (Frame Check Sequence)
Undersize Packets	Number of packets with size less than 64 bytes
Oversize Packets	Number of packets with size over than 1518 bytes
Fragments	Number of packets with size less than 64 bytes and with wrong FCS (Frame Check Sequence)
Jabbers	Number of packets with size over than 1518 bytes and with wrong FCS (Frame Check Sequence)
Collisions	Number of collisions in the Ethernet Segment (only in Half Duplex)
Buffer Overflows	

Packets 64 Octets	Number of 64 bytes packets
Packets 65-127 Octets	Number of packets with size between 65 to 127 bytes
Packets 128-255 Octets	Number of packets with size between 128 to 255 bytes
Packets 256-511 Octets	Number of packets with size between 256 to 511 bytes
Packets 512-1023 Octets	Number of packets with size between 512 to 1023 bytes
Packets >=1024 Octets	Number of packets with size equal to or higher than 1024 bytes

"firmware" sub-node

"activate" command

Table 554. "activate" command information

Name	activate
Description	Forces an ONU to reboot and startup with the specified image.
Full path	/remote-eq/status/firmware/activate
Mandatory Parameters	--imageID
Screen Output	No

Figure 651. CLI on line help on "activate" command usage in this node context

```
/cli/remote-eq/status/firmware> activate ?

Usage:
 ACTIVATE       Forces an ONU to reboot and startup with the specified image.

 <MANDATORY>
 --imageID      Identify an image by ID (0|1)

 [OPTIONAL]
 --onuID   Identifies an ONU by ID, in this context.
 --port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
 --slotIdentifies a slot. (not used for LAG)
```

"commit" command

Table 555. "commit" command information

Name	commit
Description	Indicates which of the images is used after the next reboot.
Full path	/remote-eq/status/firmware/commit

Mandatory Parameters	--imageID
Screen Output	No

Figure 652. CLI on line help on "commit" command usage in this node context

```
/cli/remote-eq/status/firmware> commit ?

Usage:
 COMMIT        Indicates which of the images is used after the next reboot.

  <MANDATORY>
  --imageID     Identify an image by ID (0|1)

  [OPTIONAL]
  --onuID   Identifies an ONU by ID, in this context.
  --port    Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slo Identifies a slot. (not used for LAG)
```

"stop-transfer" command

Table 556. "stop-transfer " command information

Name	stop-transfer
Description	Stop an ongoing image transfer to a given ONU.
Full path	/remote-eq/status/firmware/stop-transfer
Mandatory Parameters	--imageID
Screen Output	No

Figure 653. CLI on line help on "stop-transfer" command usage in this node context

```
/cli/remote-eq/status/firmware> stop-transfer ?

Usage:
 STOP-TRANSFER   Stop an ongoing image transfer to a given ONU.

  [OPTIONAL]
  --onuID   Identifies an ONU by ID, in this context.
  --port    Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
```

```
--slotIdentifies a slot. (not used for LAG)
```

"gem-port" sub-node

"statistics" sub-node

"show" command

Table 557. "show" command information

Name	show
Description	Show the GEM packet statistics for a given ONU.
Full path	/remote-eq/status/gem-port/statistics/show
Mandatory Parameters	--remote-port
Screen Output	Table, Figure 655. Table parameters description in Table 558

Figure 654. CLI on line help on "show" command usage in this node context

```
/cli/remote-eq/status/gem-port/statistics> show ?

Usage:
  SHOW          Show the GEM packet statistics for a given ONU.

  [OPTIONAL]
  --onuID   Identifies an ONU by ID, in this context.
  --port    Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot. (not used for LAG)
```

Figure 655.Output of "show" command in this node context

```
+-------------------------------------------------------------------------------+
|GEM Port counters                                                              |
+--------------------+--------------------+--------------------+----------------+
|OLT Service         |Packets Received    |Blocks Received     |Blocks Transmitted  |
+--------------------+--------------------+--------------------+----------------+
|(1)VOD              |6804                |9088                |1297740             |
+--------------------+--------------------+--------------------+----------------+
```

Table 558. "show" command output table parameters

Parameter	Description
OLT service	Indicates the OLT service identifier and name
Packets Received	Indicates the number of received packets

Blocks Received	Indicates the number of received GEM blocks
Bocks Transmitted	Indicates the number of transmitted GEM blocks

"services" sub-node

"show" command

Table 559. "show" command information

Name	show
Description	Show the current configuration.
Full path	/remote-eq/status/services/show
Mandatory Parameters	No
Screen Output	Tables Figure 657. Table parameter description in Table 560

Figure 656. CLI on line help on "show" command usage in this node context

```
/cli/remote-eq/status/services> show ?

Usage:
 SHOW          Show the current configuration

  [OPTIONAL]
  --onuID   Identifies an ONU by ID, in this context.
  --port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot. (not used for LAG)
```

Figure 657. Output of "show" command in this node context

```
+-----------------------------------------------+
|Services Status (Slot:2 Port:'PON 16' ONU ID:1)|
+-----------------------------------------+-----+
|(ID) ONU Service Name                    |Admin|
+-----------------------------------------+-----+
|(1) Id 1                                 |enable|
|(2) Id 2                                 |enable|
+-----------------------------------------+-----+
```

Table 560. "show" command output table parameters

Parameter	Description
(ID) ONU Service Name	Indicates the ONU service identifier and name
Admin	Indicates the ONU service administrative state

"active-channels" sub-node

"show" command

Table 561. "show" command information

Name	show
Description	Show the active channels on a given ONU.
Full path	/remote-eq/status/services/active-channels/show
Mandatory Parameters	--serviceID-onu
Screen Output	Tables Figure 659. Table parameter description in Table 562

Figure 658. CLI on line help on "show" command usage in this node context

```
/cli/remote-eq/status/services/active-channels> show ?

Usage:
 SHOW          Show the active channels on a given ONU.

  <MANDATORY>
  --serviceID-onu              Choose a ONU service by ID.

  [OPTIONAL]
  --onuID   Identifies an ONU by ID, in this context.
  --port    Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot. (not used for LAG)
```

Figure 659. Output of "show" command in this node context

```
+-----------------------------------------------------------------------+
|Active Channels on ONU Service: (2) Id 2                               |
+-----------------------------------------------------------------------+
|IPv4                                                                   |
+-----------------------------------------------------------------------+
|232.0.0.10                                                             |
+-----------------------------------------------------------------------+
```

Table 562. "show" command output table parameters

Parameter	Description
IPv4	Indicates active channel IPv4 address

"statistics" sub-node

“counters” sub-node

““availableValues” command

Table 563. "availableValues" command information

Name	availableValues
Description	Display all ONU services where counters can be activated
Full path	/remote-eq/status/services/statistics/counters/availableValues
Mandatory Parameters	No
Screen Output	Table, Figure 661. Table parameters description in Table 564.

Figure 660. CLI on line help on “availableValues” command usage in this node context

```
/cli/remote-eq/status/services/statistics/counters> availableValues ?

Usage:
  AVAILABLEVALUES Display all ONU services where counters can be activated.

  [OPTIONAL]
  --onuID   Identifies an ONU by ID, in this context.
  --port    Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot. (not used for LAG)
```

Figure 661. Output of ”availableValues” command in this node context

```
+-----------------------------------------+
|Services where Counters can be Activated |
+-----------------------------------------+
|ONU Service (ID) Name                    |
+-----------------------------------------+
|(1) Id 1                                 |
+-----------------------------------------+
```

Table 564. “availableValues” command output table parameters

Parameter	Description
ONU Service (ID) Name	Available ONU Service identified by Service ID (number) and Service Name

““show” command

Table 565. "show" command information

Name	show
Description	Show the statistics for a given ONU service, whose counter has already been activated.
Full path	/remote-eq/status/services/statistics/counters/show
Mandatory Parameters	--serviceID-onu
Screen Output	Table, if Service Statistics Counter is active

Figure 662. CLI on line help on "show" command usage in this node context

```
/cli/remote-eq/status/services/statistics/counters> show ?

Usage:
 SHOW          Show the statistics for a given ONU service, whose counter has already
been activated.

  <MANDATORY>
  --serviceID-onu          Choose a ONU service by ID.

  [OPTIONAL]
  --onuID   Identifies an ONU by ID, in this context.
  --port    Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot. (not used for LAG)
```

""show-active" command

Table 566. "show-active" command information

Name	show-active
Description	Display all active counters.
Full path	/remote-eq/status/services/statistics/counters/show-active
Mandatory Parameters	No
Screen Output	Table Figure 664. Table parameters description in Table 322

Figure 663. CLI on line help on "show" command usage in this node context

```
/cli/remote-eq/status/services/statistics/counters> show-active ?

Usage:
```

```
SHOW-ACTIVE     Display all active ONU service counters.

[OPTIONAL]
--onuID   Identifies an ONU by ID, in this context.
--port    Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
--slotIdentifies a slot. (not used for LAG)
```

Figure 664. Output of "show-active" command in this node context

```
+-------------------------------------------------+
|Active Counters gathering Services Statistics    |
+-------------------------------------------------+
|ONU Service (ID) Name                            |
+-------------------------------------------------+
+-------------------------------------------------+
```

Table 567. "show-active" command output table

Parameter	Description
ONU Service (ID) Name	ONU Service identified by Service ID (number) and Service Name with active counters gathering service statistics

""start" command

Table 568. "start" command information

Name	start
Description	Activate one statistics counter on the given ONU service.
Full path	/remote-eq/status/services/statistics/counters/start
Mandatory Parameters	--serviceID-onu
Screen Output	No

Figure 665. CLI on line help on "start" command usage in this node context

```
/cli/remote-eq/status/services/statistics/counters> start ?

Usage:
 START        Activate one statistics counter on the given ONU service.

 <MANDATORY>
 --serviceID-onu    Choose a ONU service by ID.
```

```
[OPTIONAL]
--onuID   Identifies an ONU by ID, in this context.
--port    Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
--slotIdentifies a slot. (not used for LAG)
```

""stop" command

Table 569. "stop" command information

Name	stop
Description	Disable an active counter on the given ONU service.
Full path	/remote-eq/status/services/statistics/counters/stop
Mandatory Parameters	--serviceID-onu
Screen Output	No

Figure 666. CLI on line help on "stop" command usage in this node context

```
/cli/remote-eq/status/services/statistics/counters> stop ?

Usage:
 STOP         Disable an active counter on the given ONU service.

 <MANDATORY>
 --serviceID-onu              Select an ONU service by ID.

 [OPTIONAL]
 --onuID                 Identifies an ONU by ID, in this context.
 --port                  Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
 --slot                  Identifies a slot. (not used for LAG)
```

"dhcp"sub-node

"show" command

Table 570. "show" command information

Name	show
Description	Show the DHCP statistics for a given unicast service that has DHCPop82 enabled.
Full path	/remote-eq/status/services/statistics/dhcp/show

Mandatory Parameters	--serviceID-onu
Screen Output	Table, Figure 668. Table parameters description in Table 571

Figure 667. CLI on line help on "show" command usage in this node context

```
/cli/remote-eq/status/services/statistics/dhcp> show ?

Usage:
  SHOW          Show the DHCP statistics for a given unicast service that has DHCPop82
enabled.

  <MANDATORY>
  --serviceID-onu     Choose a ONU service by ID.

  [OPTIONAL]
  --onuID   Identifies an ONU by ID, in this context.
  --port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot. (not used for LAG)
```

Figure 668. Output of "show" command in this node context

```
+-----------------------------------------------------------+
|(Slot:2 Port:'PON 16' ONU ID:1) DHCP Statistics on Service: |
+-----------------------------------+-----------+-----------+
|Parameter                          |Rx         |Tx         |
+-----------------------------------+-----------+-----------+
|Valid Packets                      |0          |0          |
|Drop                               |0          |--         |
+-----------------------------------+-----------+-----------+
|Client Request Without Options     |0          |--         |
|               With Option 82      |--         |--         |
|               With Option 37      |--         |--         |
|               With Option 18      |--         |--         |
+-----------------------------------+-----------+-----------+
|Server Replies Without Options     |--         |0          |
|               With Option 82      |--         |--         |
|               With Option 37      |--         |--         |
|               With Option 18      |--         |--         |
+-----------------------------------+-----------+-----------+
|Client Packets Trusted             |0          |--         |
|Client Packets With Opts Untrusted |0          |--         |
|Server Packets Untrusted           |--         |0          |
|Server Packets Without Opts Trusted|--         |0          |
+-----------------------------------+-----------+-----------+
```

Table 571. "show" command output table

Parameter	Description
Valid Packets	Indicates the number of transmitted and received valid DHCP packets
Drop	Indicates the number of transmitted and received DHCP dropped packets

Client Request	Indicates the number of transmitted and received DHCP client request packets • **Without Options** • **Option 82** • **Option 37** • **Option 17**
Server Replies	Indicates the number of transmitted and received DHCP server replies packets • **Without Options:** • **Option 82** • **Option 37** • **Option 17**
Client Packets Trusted	Number of dropped packets because they are client requests without options received in Trusted interfaces (Network side)
Client Pack with Opts Untrusted	Number of dropped packets because they are client requests with options received in Untrusted interfaces (Client side)
Server Packets Untrusted	Number of dropped packets because they are server replies with options received in Untrusted interfaces (Client Side)
Server Pack without Options Trusted	Number of dropped packets because they are server replies without options received in Trusted interfaces (Network Side)

"igmp" sub-node

"show" command

Table 572. "show" command information

Name	show
Description	Show the IGMP statistics for a given multicast client service.
Full path	/remote-eq/status/services/statistics/igmp/show
Mandatory Parameters	--serviceID-onu
Screen Output	Table

Figure 669. CLI on line help on "show" command usage in this node context

```
/cli/remote-eq/status/services/statistics/igmp> show ?

Usage:
  SHOW          Show the IGMP statistics for a given multicast service, on this ONU.

  <MANDATORY>
  --serviceID-onu     Choose a ONU service by ID.
```

```
[OPTIONAL]
--onuID   Identifies an ONU by ID, in this context.
--port    Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
--slotIdentifies a slot. (not used for LAG)
```

"t-cont" sub-node

"show" command

Table 573. "show" command information

Name	show
Description	Show the current configuration.
Full path	/remote-eq/status/t-cont/show
Mandatory Parameters	No
Screen Output	TablesFigure 671. Table parameter description in Table 571

Figure 670. CLI on line help on "show" command usage in this node context

```
/cli/remote-eq/status/t-cont> show ?

Usage:
 SHOW                  Show the current configuration

 [OPTIONAL]
 --onuID               Identifies an ONU by ID, in this context.
 --port                Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
 --slot                Identifies a slot. (not used for LAG)
```

Figure 671. Output of ”show” command in this node context

```
/cli/remote-eq/status/t-cont> show --onuID=2 --port=pon.1 --slot=3
+-------------------------------------------------------------------------------------------------+
|T-CONT (Slot:3 Port:'PON 1' ONU ID:2)                                                            |
+----------+--------------------+-------------+-------+---------------+----------+--------------+
|T-CONT    |ONU Service Name    |Priority bit |GEM    |Priority Queue |ALLOC-ID  |T-CONT ME ID |
+----------+--------------------+-------------+-------+---------------+----------+--------------+
|--        |(1) Traffic_Test    |0            |521    |0              |258       |32768         |
|          |(1) Traffic_Test    |1            |522    |0              |          |              |
|          |(1) Traffic_Test    |2            |523    |0              |          |              |
|          |(1) Traffic_Test    |3            |524    |0              |          |              |
|          |(1) Traffic_Test    |4            |525    |0              |          |              |
|          |(1) Traffic_Test    |5            |526    |0              |          |              |
|          |(1) Traffic_Test    |6            |527    |0              |          |              |
|          |(1) Traffic_Test    |7            |528    |0              |          |              |
+----------+--------------------+-------------+-------+---------------+----------+--------------+
```

Table 574. “show” command output table parameters

Parameter	Description
T-CONT	Identifies the T-CONT
ONU Service Name	Indicates Client Service
Priority bit	Indicates used priority bits
GEM	Indicates used GEM
Priority Queue	Indicates Used priority queue
ALLOC-ID	Indicates ALLOC-ID
T-CONT ME ID	Indicates T-CONT MEID

“services” node

This node is used to configure, create and remove services and view traffic statistics information.

Figure 672.services node tree

```
/cli/services> tree
+ services[@availableValues, @config, @create, @remove, @show, @showconfig]
  + rate-limiters[@config, @show, @showconfig]
  + statistics[]
    + counters[@availableValues, @show, @show-active, @start, @stop]
    + dhcp[@availableValues, @show]
    + igmp[@availableValues, @show]
```

“availableValues” command

Table 575. "availableValues" command information

Name	availableValues
Description	Show the available <slot-port> combination values for creating new services.
Full path	/services/availableValues
Mandatory Parameters	This command has no parameters
Screen Output	Table Figure 674.Table parameters description Table 576

Figure 673. CLI on line help on “availableValues” command usage in this node context

```
/cli/services> availableValues ?

Usage:
 AVAILABLEVALUES Show the available <slot-port> combination values for creating new services.
```

Figure 674.Output of ”availableValues” command in this node context”

```
+-------------------------------------------------------------------------------+
|Available Uplink interfaces                                                    |
+-----+-------------------------------------------------------------------------+
|Slot |Interfaces                                                               |
+-----+-------------------------------------------------------------------------+
|1    |Eth 1, Eth 2                                                             |
|5    |Eth 1, Eth 2                                                             |
+-----+-------------------------------------------------------------------------+

+-------------------------------------------------------------------------------+
|Available Downlink interfaces                                                  |
+-----+-------------------------------------------------------------------------+
|Slot |Interface                                                                |
+-----+-------------------------------------------------------------------------+
|2    |PON 1, PON 2, PON 3, PON 4, PON 5, PON 6, PON 7, PON 8, PON 9, PON 10    |
|     |PON 11, PON 12, PON 13, PON 14, PON 15, PON 16                           |
|3    |PON 1, PON 2, PON 3, PON 4, PON 5, PON 6, PON 7, PON 8, PON 9, PON 10    |
|     |PON 11, PON 12, PON 13, PON 14, PON 15, PON 16                           |
+-----+-------------------------------------------------------------------------+
```

Table 576. “availableValues” command output Uplink/Downlink table parameters

Parameter	Description
Slot	Indicates the slot
Port	Indicates the OLT interface

“config” command

Table 577. "config" command information

Name	config
Description	Configure parameters for a given service.
Full path	/services/config
Mandatory Parameters	--serviceID
Screen Output	No

Figure 675. CLI on line help on “config” command usage in this node context

```
/cli/services> config ?

Usage:
  CONFIG         Configure parameters for a given service.

   <MANDATORY>
   --serviceID     Select an OLT service by ID.

   [OPTIONAL]
   --add-downlink-ports   Add interfaces to the Downlink interface List, for a given service.
    (format: slot.port|slot(all) : 3.1,3.5,7)
   --add-uplink-lags  Add LAG interfaces to the Uplink interface List for a given service.
    (format: lagID : 1,2,3)
   --add-uplink-ports Add interfaces to the Uplink interface List, for a given service.
    (format: slot.port|slot(all) : 3.1,3.5,7)
   --admin   Administrative State. Enable/disable, in this context.  (enable|disable)
   --del-downlink-ports   Remove interfaces from the Downlink interface List, for a given
    service. (format: slot.port|slot(all) : 3.1,3.5,7)
   --del-uplink-lags  Remove LAG interfaces from the Uplink interface List, for a given
    service. (format: lagID : 1,2,3)
   --del-uplink-ports Remove interfaces from the Uplink interface List, for a given  service.
(format: slot.port|slot(all) : 3.1,3.5,7)
   --dhcp     Enable or disable the DHCP relay for a given service.       (enable|disable)
   --igmp     Enable or disable IGMP for a given service. (enable|disable)
   --mcFlood      Multicast flooding. (enable|disable)
   --nni-stagOuter VLAN ID (service) on the network-facing (Ethernet)      interface.
(1..4094)
   --pppoe   Enable or disable PPPoE for a given service. (enable|disable)
```

```
--serviceName      The Name for the new service.
--stacked Frame format for the uplink interface. If enabled, it has two VLAN tags, otherwise only one VLAN tag. (enable|disable)
--type      Identifies the type of service. (unicast|multicast|bitstream|univoip)
--uni-ctag      VLAN ID delivered/received from the (Ethernet) subscriber-facing interface at the ONU. (1..4094)
```

"create" command

Table 578. "create" command information

Name	create
Description	Create a new network service.
Full path	/services/create
Mandatory Parameters	--nni-stag --serviceName --type --uni-ctag
Screen Output	No

Figure 676. CLI on line help on "create" command usage in this node context

```
/cli/services> create ?

Usage:
 CREATE        Create a new network service.

  <MANDATORY>
  --nni-stagOuter VLAN ID (service) on the network-facing (Ethernet) interface. (1..4094)
  --serviceName      The Name for the new service.
  --type      Identifies the type of service. (unicast|multicast|bitstream|univoip)
  --uni-ctag      VLAN ID delivered/received from the (Ethernet) subscriber-facing interface at the ONU. (1..4094)

  [OPTIONAL]
  --add-downlink-ports   Add interfaces to the Downlink interface List, for a given service. (format: slot.port|slot(all) : 3.1,3.5,7)
  --add-uplink-lags  Add LAG interfaces to the Uplink interface List for a given service. (format: lagID : 1,2,3)
  --add-uplink-ports Add interfaces to the Uplink interface List, for a given service.
```

```
(format: slot.port|slot(all) : 3.1,3.5,7)
--admin   Administrative State. Enable/disable, in this context. (enable|disable)
--dhcp    Enable or disable the DHCP relay for a given service. (enable|disable)
--igmp    Enable or disable IGMP for a given service. (enable|disable)
--mcFlood     Multicast flooding. (enable|disable)
--pppoe   Enable or disable PPPoE for a given service. (enable|disable)
--stacked Frame format for the uplink interface. If enabled, it has two VLAN tags,
otherwise only one VLAN tag. (enable|disable)
```

About the service type:

- **Unicast:** Bidirectional service, where each frame has only one final destination. These services are used in Residential applications, where some kinds of packets can be trapped and processed (ex. DHCP, IGMP). In case of Unstacked Services, MAC Learning is preformed.
- **Multicast:** Unidirectional Service, where one frame can be delivered to several destinations. These destinations are controlled by IGMP Snooping/Prox**y.**
- **UniVoIP:** Bidirectional Service, where each frame has only one final destination. Similar to Unicast Services, with the difference that when it's configured to the ONU, VoIP configurations are downloaded to the ONU.
- **Bitstream:** Bidirectional Service, where each frame has only one final destination. These services are used in Business applications, where all packets pass transparently by the system and MAC learning is disabled.

"remove" command

Table 579. "remove" command information

Name	remove
Description	Remove an existing service
Full path	/services/remove
Mandatory Parameters	--serviceID
Screen Output	No

Figure 677. CLI on line help on "remove" command usage in this node context

```
/cli/services> remove ?

Usage:
 REMOVE       Remove an existing service.

 <MANDATORY>
 --serviceID    Select an OLT service by ID.
```

“show” command

Table 580. "show" command information

Name	show
Description	Show the current services configuration. If a service ID is given shows all the downlink ports.
Full path	/services/show
Mandatory Parameters	No
Screen Output	Tables Figure 679 and Figure 680.Table parameters description in Table 581 and Table 582.

Figure 678. CLI on line help on “show” command usage in this node context

```
/cli/services> show ?

Usage:
 SHOW          Show the current services configuration. If a service ID is given shows all
the downlink ports.

  [OPTIONAL]
  --serviceID     Select an OLT service by ID.
```

Figure 679.Output of ”show” command in this node context

```
|Network Services Summary
+---+-------------------------------+--------+-----------+--------+--------+--------+--------+--------+---------+---------+
|ID |Name                           |Admin   |Type       |Stacked |MC Flood|DHCP    |PPPoE   |IGMP    |NNI-STAG |UNI-CTAG |
+---+-------------------------------+--------+-----------+--------+--------+--------+--------+--------+---------+---------+
|1  |VOD                            |enable  |unicast    |enable  |enable  |enable  |disable |enable  |100      |100      |
|2  |IPTV                           |enable  |multicast  |disable |disable |disable |disable |disable |102      |100      |
|3  |VOD unstacked                  |enable  |unicast    |disable |enable  |enable  |disable |enable  |200      |200      |
|4  |IPTV unstacked                 |enable  |multicast  |disable |disable |disable |disable |disable |202      |200      |
+---+-------------------------------+--------+-----------+--------+--------+--------+--------+--------+---------+---------+
```

Table 581. “show” command output table parameters

Parameter	Description
ID	Service Identifier
Name	Name that identifies the Service
Admin	Service Administrative State
Type	Identifies the type of service: **Unicast**: Bidirectional service, where each frame has only one final destination. These services are used in Residential applications, where some kinds of packets can be trapped and processed (ex. DHCP, IGMP). In case of Unstacked Services, MAC Learning is preformed. **Multicast**: Unidirectional Service, where one frame can be delivered to several destinations. These destinations are controlled by IGMP Snooping/Proxy.

	UniVoIP: Bidirectional Service, where each frame has only one final destination. Similar to Unicast Services, with the difference that when it's configured to the ONT, VoIP configurations are downloaded to the ONT. **Bitstream**: Bidirectional Service, where each frame has only one final destination. These services are used in Business applications, where all packets pass transparently by the system and MAC learning is disabled.
Stacked	Provides the frame format in the uplink interface. If it's Stacked the frame contains two vlan tags, if it's Unstacked the frame contains only one vlan tag. Both vlans have Ethertype=0x8100.
MC Flood	Indicates Multicast flooding. configuration for a given service(enable|disable)
DHCP	Identifies if the service must work has a DHCP Relay Agent.
PPPoE	Indicates PPPoE configuration for a given service. (enable|disable)
IGMP	Indicates IGMP configuration for a given service. (enable|disable)
NNI S-TAG	Identifies the outer tag of the service used in the uplink port
UNI C-TAG	Identifies the VLAN delivered/received to/from the ONT. After this VLAN can be translated in the ONT.

This command used with serviceID parameter provides detailed information on the specified service configuration,

Figure 680. Output of "show" command used with parameter –serviceID, in this node context

```
+--------------------------------+
|Network Service (1) 'VOD'       |
+--------------------+-----------+
|Parameter           |Value      |
+--------------------+-----------+
|Admin               |enable     |
|Type                |unicast    |
|Stacked             |enable     |
|MC Flood            |enable     |
|DHCP                |enable     |
|PPPoE               |disable    |
|IGMP                |enable     |
+--------------------+-----------+
|NNI-STAG            |100        |
|UNI-CTAG            |100        |
+--------------------+-----------+
|Uplink Interfaces   | 1/Eth 2   |
+--------------------+-----------+
|Downlink Interfaces |2/PON 16   |
|                    |3/PON 1    |
+--------------------+-----------+
```

Table 582. Show command, used with serviceId parameter, output table parameters

Parameter	Description
Admin	Service Administrative State
Type	Identifies the type of service: **Unicast**: Bidirectional service, where each frame has only one final destination. These services are used in Residential applications, where some kinds of packets can be trapped and processed (ex. DHCP, IGMP). In case of Unstacked Services, MAC Learning is preformed. **Multicast**: Unidirectional Service, where one frame can be delivered to several destinations. These destinations are controlled by IGMP Snooping/Proxy. **UniVoIP**: Bidirectional Service, where each frame has only one final destination. Similar

	to Unicast Services, with the difference that when it's configured to the ONT, VoIP configurations are downloaded to the ONT. **Bitstream**: Bidirectional Service, where each frame has only one final destination. These services are used in Business applications, where all packets pass transparently by the system and MAC learning is disabled.
Stacked	Provides the frame format in the uplink interface. If it's Stacked the frame contains two vlan tags, if it's Unstacked the frame contains only one vlan tag. Both vlans have Ethertype=0x8100.
Mult. Flood	Multicast flooding. (enable|disable)
DHCP	Identifies if the service must work has a DHCP Relay Agent.
PPPoE	Enable or disable PPPoE for a given service. (enable|disable)
IGMP	Enable or disable IGMP for a given service. (enable|disable)
NNI S-TAG	Identifies the outer tag of the service on the network-facing (Ethernet) interface in the uplink port (1..4094)
UNI C-TAG	Identifies the VLAN delivered/received to/from the (Ethernet) subscriber-facing interface at the ONU. (1..4094) After this VLAN can be translated in the ONU.
Uplink Interfaces	Uplink Slot/port pair (NNI)
Downlink Interfaces	Slot/Port (PON) pair (UNI).Identifies the GPON port(s) associated to the Service

"showconfig" command

Table 583. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/services/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 681. CLI on line help on "showconfig" command usage in this node context

```
/cli/services> showconfig ?


Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

"rate-limiters" sub-node

"config" command

Table 584. "config" command information

Name	config
Description	Configure the global rate limiters.
Full path	/services/rate-limiters/config
Mandatory Parameters	No mandatory parameters
Screen Output	No

Figure 682. CLI on line help on "config" command usage in this node context

```
/cli/services/rate-limiters> config ?

Usage:
  CONFIG                  Configure the global rate limiters.

  [OPTIONAL]
  --broadcast             todo bradcast (0..1000000)
  --multicast             todo multicast (0..1000000)
  --unknown-unicast       todo unicast (0..1000000)
```

"show" command

Table 585. "show" command information

Name	show
Description	Show the current global rate limiters configuration.
Full path	/services/rate-limiters/show
Mandatory Parameters	No
Screen Output	Tables Figure 684.Table parameters description in Table 586

Figure 683. CLI on line help on "show" command usage in this node context

```
/cli/services/rate-limiters> show ?

Usage:
  SHOW                    Show the current global rate limiters configuration.
```

Figure 684.Output of "show" command in this node context

```
/cli/services/rate-limiters> show
+-----------------------------------------------------------------+
|Global Rate Limiters (bps)                                       |
+--------------------+--------------------+--------------------+
|Broadcast           |Multicast           |Unknown Unicast     |
+--------------------+--------------------+--------------------+
|1000000             |1000000             |1000000             |
+--------------------+--------------------+--------------------+
/cli/services/rate-limiters>
```

Table 586. "show" command output table parameters

Parameter	Description
Broadcast	Global Rate Limiter for Broadcast services (bps)
Multicast	Global Rate Limiter for Multicast services (bps)
Unknow Unicast	Global Rate Limiter for Unknown Unicast services (bps)

"showconfig" command

Table 587. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/services/rate-limiters/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 685. CLI on line help on "showconfig" command usage in this node context

```
/cli/services/rate-limiters> showconfig ?

Usage:
  SHOWCONFIG                Print the command list that enforces the current configuration
```

"statistics" sub-node

"counters" sub-node

"availableValues" command

Table 588. "availableValues" command information

Name	availableValues

Description	Display all services and Interfaces where counters can be activated.
Full path	/services/statistics/counters/availableValues
Mandatory Parameters	This command has no parameters
Screen Output	Table, Figure 687. Table parameters description in Table 589.

Figure 686. CLI on line help on "availableValues" command usage in this node context

```
/cli/services/statistics/counters> availableValues ?

Usage:
 AVAILABLEVALUES Display all services and Interfaces where counters can be activated.
```

Figure 687. Output of "availableValues" command in this node context

```
+-------------------------------------------------+
|Interfaces where Counters can be Activated
+-----------------------------------+-----+---------+
|Service (ID) Name                  |Slot |Port
+-----------------------------------+-----+---------+
|(1) VOD                            |2    |PON 16
|                                   |1    |Eth 2
|                                   |3    |PON 1
+-----------------------------------+-----+---------+
|(2) IPTV                           |2    |PON 16
|                                   |1    |Eth 2
|                                   |3    |PON 1
+-----------------------------------+-----+---------+
|(3) VOD unstacked                  |2    |PON 16
|                                   |1    |Eth 2
|                                   |3    |PON 1
+-----------------------------------+-----+---------+
|(4) IPTV unstacked                 |2    |PON 16
|                                   |1    |Eth 2
|                                   |3    |PON 1
+-----------------------------------+-----+---------+
```

Table 589. "availableValues" command output table parameters

Parameter	Description
Service (ID) Name	Available Service identified by Service ID (number) and Service Name
Slot	Slot number where is the port with the service available
Port	Port number where the service is available.

"show" command

Table 590. "show" command information

Name	show
Description	Show the statistics for a given service and interface, whose counter has already been activated.
Full path	/services/statistics/counters/show
Mandatory Parameters	--serviceID
Screen Output	Table

Figure 688. CLI on line help on "show" command usage in this node context

```
/cli/services/statistics/counters> show ?

Usage:
  SHOW          Show the statistics for a given service and interface, whose counter has already been
activated.

  <MANDATORY>
  --serviceID                Select an OLT service by ID.

  [OPTIONAL]
  --port                     Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slot                     Identifies a slot. (not used for LAG)
```

"show-active" command

Table 591. "show-active" command information

Name	Show-active
Description	Display all active counters.
Full path	/services/statistics/counters/show-active
Mandatory Parameters	This command has no parameters
Screen Output	Table Figure 690. Table parameters description in Table 592

Figure 689. CLI on line help on "show" command usage in this node context

```
/cli/services/statistics/counters> show-active ?

Usage:
```

```
SHOW-ACTIVE     Display all active counters.
```

Figure 690. Output of "show-active" command in this node context

```
+-----------------------------------------------+
|Active Counters gathering Services Statistics  |
+-----------------------------------+-----+-----+
|Service (ID) Name                  |Slot |Port |
+-----------------------------------+-----+-----+
+-----------------------------------+-----+-----+
```

Table 592. "show-active" command output table

Parameter	Description
Service (ID) Name	Service identified by Service ID (number) and Service Name with active counters gathering service statistics
Slot	Slot number where is the port with the service available
Port	Port number where the service is available.

"start" command

Table 593. "start" command information

Name	start
Description	Start the statistics counter for a given interface and service.
Full path	/services/statistics/counters/start
Mandatory Parameters	--serviceID
Screen Output	No

Figure 691. CLI on line help on "start" command usage in this node context

```
/cli/services/statistics/counters> start ?

Usage:
 START          Start the statistics counter for a given interface and service.

  <MANDATORY>
  --serviceID    Select an OLT service by ID.

  [OPTIONAL]
```

```
--port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
--slotIdentifies a slot. (not used for LAG)
```

"stop" command

Table 594. "stop" command information

Name	stop
Description	Stop an active statistics counter.
Full path	/services/statistics/counters/stop
Mandatory Parameters	--serviceID
Screen Output	No

Figure 692. CLI on line help on "stop" command usage in this node context

```
/cli/services/statistics/counters> stop ?

Usage:
 STOP          Stop an active statistics counter.

  <MANDATORY>
  --serviceID     Select an OLT service by ID.

  [OPTIONAL]
  --port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --slotIdentifies a slot. (not used for LAG)
```

"dhcp"sub-node

"availableValues" command

Table 595. "availableValues" command information

Name	availableValues
Description	Display possible values for service IDs and Interfaces.
Full path	/services/statistics/dhcp/availableValues
Mandatory Parameters	This command has no parameters
Screen Output	Table, Figure 694. Table parameters description in Table 596.

Figure 693. CLI on line help on "availableValues" command usage in this node context

```
/cli/services/statistics/dhcp> availableValues ?

Usage:
 AVAILABLEVALUES Display possible values for service IDs and Interfaces.
```

Figure 694. Output of "availableValues" command in this node context

```
+-----------------------------------------------------
|Slots and Interfaces with DHCP statistics Available
+-----------------------------------+-----+---------
|Service (ID) Name                  |Slot |Port
+-----------------------------------+-----+---------
|(1) VOD                            |2    |PON 16
|                                   |3    |PON 1
+-----------------------------------+-----+---------
|(3) VOD unstacked                  |2    |PON 16
|                                   |3    |PON 1
+-----------------------------------+-----+---------
```

Table 596. "availableValues" command output table parameters

Parameter	Description
Service (ID) Name	Available Service identified by Service ID (number) and Service Name
Slot	Slot number where is the port with the service available
Port	Port number where the service is available.

"show" command

Table 597. "show" command information

Name	show
Description	Show DHCP statistics for a unicast service with DHCPop82 enabled. If no port is given, show the slot information.
Full path	/services/statistics/dhcp/show
Mandatory Parameters	--serviceID --slot
Screen Output	Table, Figure 696. Table parameter description in Table 598.

Figure 695. CLI on line help on "show" command usage in this node context

```
/cli/services/statistics/dhcp> show ?
```

Usage:

SHOW Show DHCP statistics for a unicast service with DHCPop82 enabled. If no port is given, show the slot information.

<MANDATORY>

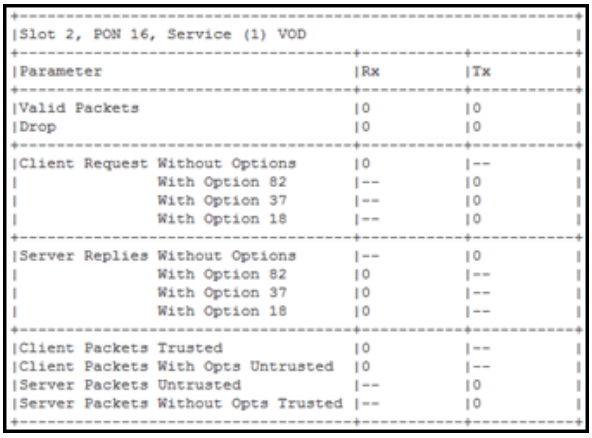
--serviceID Select an OLT service by ID.

--slotIdentifies a slot.

[OPTIONAL]

--port Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)

Figure 696. Output of "show" command in this node context



```
+-------------------------------------------------------------+
|Slot 2, PON 16, Service (1) VOD                              |
+-----------------------------------+-----------+-------------+
|Parameter                          |Rx         |Tx           |
+-----------------------------------+-----------+-------------+
|Valid Packets                      |0          |0            |
|Drop                               |0          |0            |
+-----------------------------------+-----------+-------------+
|Client Request Without Options     |0          |--           |
|               With Option 82      |--         |0            |
|               With Option 37      |--         |0            |
|               With Option 18      |--         |0            |
+-----------------------------------+-----------+-------------+
|Server Replies Without Options     |--         |0            |
|               With Option 82      |0          |--           |
|               With Option 37      |0          |--           |
|               With Option 18      |0          |--           |
+-----------------------------------+-----------+-------------+
|Client Packets Trusted             |0          |--           |
|Client Packets With Opts Untrusted |0          |--           |
|Server Packets Untrusted           |--         |0            |
|Server Packets Without Opts Trusted|--         |0            |
+-----------------------------------+-----------+-------------+
```

Table 598. "show" command output table

Parameter	Description
Valid Packets	Indicates the number of transmitted and received valid DHCP packets
Drop	Indicates the number of transmitted and received DHCP dropped packets
Client Request	Indicates the number of transmitted and received DHCP client request packets • **Without Options** • **Option 82** • **Option 37** • **Option 17**
Server Replies	Indicates the number of transmitted and received DHCP server replies packets • **Without Options:** • **Option 82** • **Option 37** • **Option 17**

Client Packets Trusted	Number of dropped packets because they are client requests without options received in Trusted interfaces (Network side)
Client Pack with Opts Untrusted	Number of dropped packets because they are client requests with options received in Untrusted interfaces (Client side)
Server Packets Untrusted	Number of dropped packets because they are server replies with options received in Untrusted interfaces (Client Side)
Server Pack without Options Trusted	Number of dropped packets because they are server replies without options received in Trusted interfaces (Network Side)

"igmp" sub-node

"availableValues" command

Table 599. "availableValues" command information

Name	availableValues
Description	Display possible values for service IDs and Interfaces.
Full path	/services/statistics/igmp/availableValues
Mandatory Parameters	This command has no parameters
Screen Output	Table, Figure 698. Table parameters description in Table 600

Figure 697. CLI on line help on "availableValues" command usage in this node context

```
/cli/services/statistics/igmp> availableValues ?

Usage:
  AVAILABLEVALUES Display possible values for service IDs and Interfaces.
```

Figure 698. Output of "availableValues" command in this node context

```
+-------------------------------------------------------
|Interfaces with IGMP statistics Available
+-----------------------------------+-----+----------
|Service (ID) Name                  |Slot |Port
+-----------------------------------+-----+----------
|(1) VOD                            |2    |PON 16
|                                   |1    |Eth 2
|                                   |3    |PON 1
+-----------------------------------+-----+----------
|(2) IPTV                           |2    |PON 16
|                                   |1    |Eth 2
|                                   |3    |PON 1
+-----------------------------------+-----+----------
|(3) VOD unstacked                  |2    |PON 16
|                                   |1    |Eth 2
|                                   |3    |PON 1
+-----------------------------------+-----+----------
|(4) IPTV unstacked                 |2    |PON 16
|                                   |1    |Eth 2
|                                   |3    |PON 1
+-----------------------------------+-----+----------
```

Table 600. "availableValues" command output table parameters

Parameter	Description
Service (ID) Name	Available Service identified by Service ID (number) and Service Name
Slot	Slot number where is the port with the service available
Port	Port number where the service is available.

"show" command

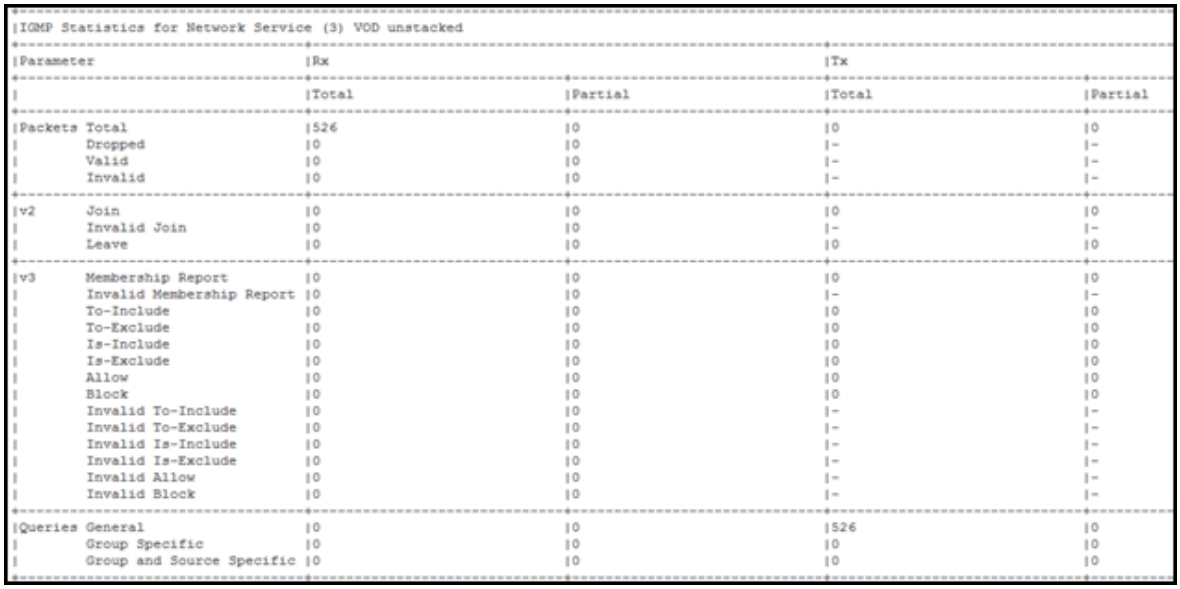
Table 601. "show" command information

Name	show
Description	Show the IGMP statistics for a given multicast service and respective interface.
Full path	/services/statistics/igmp/show
Mandatory Parameters	--port --serviceID
Screen Output	Table, Figure 700. Table parameter description in Table 602

Figure 699. CLI on line help on "show" command usage in this node context

```
/cli/services/statistics/igmp> show ?

Usage:
 SHOW          Show the IGMP statistics for a given multicast service and respective interface.

  <MANDATORY>
  --port     Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --serviceID   Select an OLT service by ID.

  [OPTIONAL]
  --slot     Identifies a slot. (not used for LAG)
```

Figure 700. Output of "show" command in this node context



IGMP Statistics for Network Service (3) VOD unstacked

Parameter		Rx		Tx	
		Total	Partial	Total	Partial
Packets	Total	526	0	0	0
	Dropped	0	0	-	-
	Valid	0	0	-	-
	Invalid	0	0	-	-
v2	Join	0	0	0	0
	Invalid Join	0	0	-	-
	Leave	0	0	0	0
v3	Membership Report	0	0	0	0
	Invalid Membership Report	0	0	-	-
	To-Include	0	0	0	0
	To-Exclude	0	0	0	0
	Is-Include	0	0	0	0
	Is-Exclude	0	0	0	0
	Allow	0	0	0	0
	Block	0	0	0	0
	Invalid To-Include	0	0	-	-
	Invalid To-Exclude	0	0	-	-
	Invalid Is-Include	0	0	-	-
	Invalid Is-Exclude	0	0	-	-
	Invalid Allow	0	0	-	-
	Invalid Block	0	0	-	-
Queries	General	0	0	526	0
	Group Specific	0	0	0	0
	Group and Source Specific	0	0	0	0

Table 602. "show" command output table parameters

Parameter	Description
Packets	Indicates the number of transmitted and received packets (Total and Partial counters displayed): • **Total:** sum of all packets • **Dropped:** sum of all dropped packets • **Valid:** sum of all valid (compliant with the IGMP standards) packets • **Invalid:** sum of all invalid (non-compliant with the IGMP standards) packets
V2	Indicates the number of transmitted and received IGMPv2 packets of type • **Join** • **Invalid Join** • **Leave**
V3	Number of Transmitted and Received IGMPv3 packets (Total and Partial counters displayed) of type: • **Membership Report** • **Invalid Membership Report** • **To-Include** • **To-exclude** • **Is-Include** • **Is-Exclude** • **Allow** • **Block**

	• **Invalid To-Include** • **Invalid To-Exclude** • **Invalid Is-Include** • **Invalid Is-Exclude** • **Invalid Allow** • **Invalid Block**
Queries	Number of transmitted and Received Queries (Total and Partial counters displayed) • **General:** of type General queries • **Group Specific:** of type Group specific queries • **Group and Source Specific:** of type Group and Source specific queries

"synchronism" node

Figure 701."synchronim" node tree

```
/cli/synchronism> tree
+ synchronism[]
  + global[@config, @show, @showconfig]
    + sources[@availableValues, @config, @show]
  + ptp[@config, @show, @showconfig]
    + port[@availableValues, @config, @create, @remove, @show, @showconfig]
      + ip-access-list[@config, @create, @remove, @show]
  + status[]
    + global[@command, @show]
      + sources[@command, @show]
    + ptp[@show]
```

"global" sub-node

"config" command

Table 603. "config" command information

Name	config
Description	Configure synchronism global parameters
Full path	/synchronism/global/config
Mandatory Parameters	No
Screen Output	No

Figure 702. CLI on line help on "config" command usage in this node context

```
/cli/synchronism/global> config ?

Usage:
  CONFIG          Configure synchronism global parameters

  [OPTIONAL]
  --free-run-source Activate or deactivate the free-run source     (enable|disable)
  --holdover-msg-delay Set the Holdover message delay (500..2000 ms)
  --min-quality-before-squelch   Set the Minimum quality before squelch
  --quality-level-mode  Enables synchronism quality level (enable|disable)
  --reversibility-level-mode Enables revertive switching mode when recovering from a failure (enable|disable)
  --reversibility-time     Set the Reversibility time (0..3600 sec.)
  --send-val-after-quality-unknown  Set the value to be sent in case Quality Unknown is received
  --switching-msg-delay      Set the Switching message delay (180..500 ms)
```

"show" command

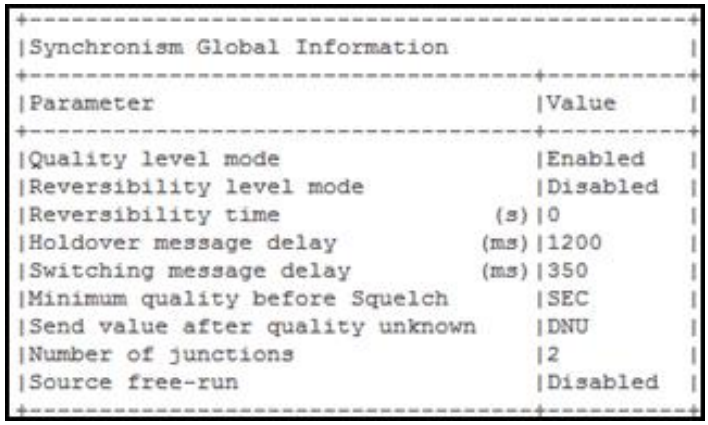
Table 604. "show" command information

Name	show
Description	Show the current services configuration. If a service ID is given shows all the downlink ports.
Full path	/synchronism/global/show
Mandatory Parameters	This command has no parameters
Screen Output	Tables Figure 704.Table parameters description in Table 605

Figure 703. CLI on line help on "show" command usage in this node context

```
/cli/synchronism/global> show ?

Usage:
  SHOW          Show the current configuration
```

Figure 704.Output of "show" command in this node context"



```
+-----------------------------------------------+
|Synchronism Global Information                 |
+-----------------------------------+-----------+
|Parameter                          |Value      |
+-----------------------------------+-----------+
|Quality level mode                 |Enabled    |
|Reversibility level mode           |Disabled   |
|Reversibility time              (s)|0          |
|Holdover message delay         (ms)|1200       |
|Switching message delay        (ms)|350        |
|Minimum quality before Squelch     |SEC        |
|Send value after quality unknown   |DNU        |
|Number of junctions                |2          |
|Source free-run                    |Disabled   |
+-----------------------------------+-----------+
```

Table 605. "show" command output table parameters

Parameter	Description
Quality level-mode	Configured Synchronism quality level. If enabled the user can set the equipment synchronization to take into account the SSM synchronization sources (Synchronization Status Message)
Reversilibity-level-Mode	Configured reversal switching mode when recovering from a failure. If Enabled: the status machine of the equipment only considers for synchronization source, a source that does not show timing flaws and where the Reversibility Time has expired. If the quality/priority of this source (depending on the current configuration of the Quality Level Mode) is higher than the current source, the equipment will use this quality/priority source. Otherwise the source is not changed. If Disabled: a source that has been previously considered invalid will only be used for synchronization, if the current source fails and if there is no other source with a higher quality/priority
Reversibility-time (s)	Configured reversibility time - time, in seconds: after this period of time, the fault condition disappears and the invalid source will be reconsidered for synchronization. This time is considered after the Wait-To-Restore time has elapsed
Holdver-message delay (ms)	Configured Holdover message delay - time, in milliseconds, considered in the case where the equipment is in Holdover mode. This state is due to a fault condition in the selected synchronization source and when there is no other available source.
Switching message delay (ms)	Configured switching message delay in milliseconds, applicable in the case where changing to another synchronization source is carried out with a different Quality Level value. This delay sets the elapsed time between the trigger of the new synchronization source and a change in the output Quality Level.
Minimum quality before Squelch	Configured Minimum quality before squelch value. The equipment will squelch the synchronization source if there is no other source with a quality level equal to or better than the selected source.
Send value after quality unknown	Configured value to be sent if Quality Unknown is received. The equipment will make the SSM output with the respective Quality Level configured if there is no synchronization source with a Quality Level other than Quality Unknown

Number of junctions	Number of junctions that can be used for as shynchronim source
Source free-run	Source free-run If enabled the system always synchronizes with its internal clock (array unit PLL).

"showconfig" command

Table 606. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/synchronism/global/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 705. CLI on line help on "showconfig" command usage in this node context

```
/cli/synchronism/global> showconfig ?

Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

"sources" sub-node

"availableValues" command

Table 607. "availableValues" command information

Name	availableValues
Description	Show the available values for configurable parameters. Can filter by source ID.
Full path	/synchronim/global/sources/availableValues
Mandatory Parameters	No
Screen Output	Table, Figure 707. Table parameters description in Table 608

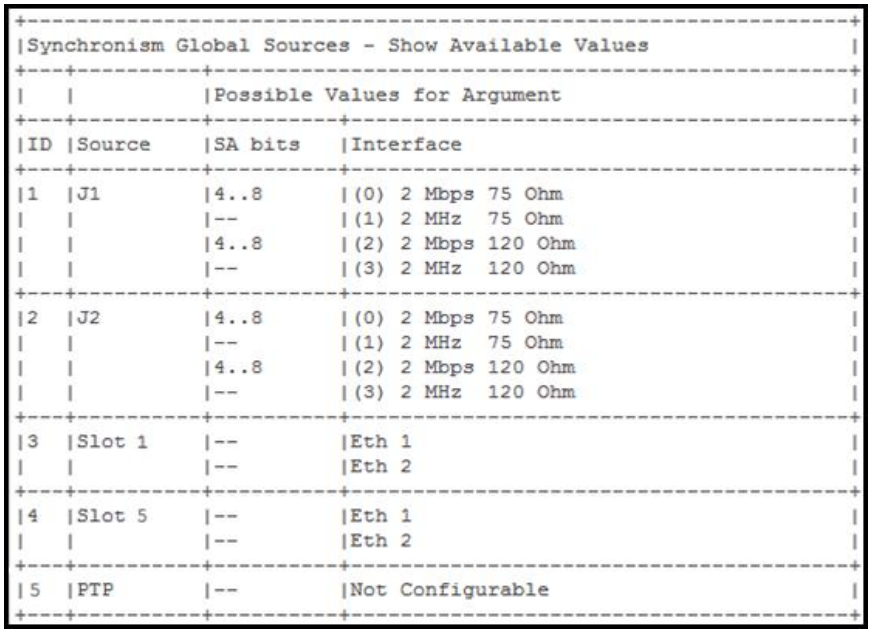
Figure 706. CLI on line help on "availableValues" command usage in this node context

```
/cli/synchronism/global/sources> availableValues ?

Usage:
  AVAILABLEVALUES Show the available values for configurable parameters. Can filter by
source ID.
```

[OPTIONAL]

--ID Identifies a table entry by ID, in this context.

Figure 707. Output of "availableValues" command in this node context



```
+-------------------------------------------------------------------+
|Synchronism Global Sources - Show Available Values                 |
+---+----------+----------+---------------------------------------+
|   |          |Possible Values for Argument                       |
+---+----------+----------+---------------------------------------+
|ID |Source    |SA bits   |Interface                              |
+---+----------+----------+---------------------------------------+
|1  |J1        |4..8      |(0) 2 Mbps 75 Ohm                      |
|   |          |--        |(1) 2 MHz  75 Ohm                      |
|   |          |4..8      |(2) 2 Mbps 120 Ohm                     |
|   |          |--        |(3) 2 MHz  120 Ohm                     |
+---+----------+----------+---------------------------------------+
|2  |J2        |4..8      |(0) 2 Mbps 75 Ohm                      |
|   |          |--        |(1) 2 MHz  75 Ohm                      |
|   |          |4..8      |(2) 2 Mbps 120 Ohm                     |
|   |          |--        |(3) 2 MHz  120 Ohm                     |
+---+----------+----------+---------------------------------------+
|3  |Slot 1    |--        |Eth 1                                  |
|   |          |--        |Eth 2                                  |
+---+----------+----------+---------------------------------------+
|4  |Slot 5    |--        |Eth 1                                  |
|   |          |--        |Eth 2                                  |
+---+----------+----------+---------------------------------------+
|5  |PTP       |--        |Not Configurable                       |
+---+----------+----------+---------------------------------------+
```

Table 608. "availableValues" command output table parameters

Parameter	Description
ID	Identifies a synchronism source by ID
Source	Identifies a synchronism source by Name
SA bits	Indicates the available values for the SA bits
Interface	Identifies the synchronism interface by ID and Name

"config" command

Table 609. "config" command information

Name	config
Description	Configure synchronism sources information.
Full path	/synchronism/sources/config
Mandatory Parameters	--ID
Screen Output	No

Figure 708. CLI on line help on "config" command usage in this node context

```
/cli/synchronism/global/sources> config ?

Usage:
  CONFIG        Configure synchronism sources information.

   <MANDATORY>
   --ID      Identifies a table entry by ID, in this context.

   [OPTIONAL]
   --QL-SSM   Set the Quality-Level for this particular clock source
   --active  Enables clock source activation (enable|disable)
   --hold-off-time  If a source goes down, wait 'n' (ms) before removing it from the clock
  selection (300..1800 ms)
   --interface    Set the interface of the card to be used as clock source.    (@availableValues)
   --priority     Set the clock source priority value (1..253)
   --sa-bit-RX  Configure SA bit used for reception of SSM packets(4..8)
   --sa-bit-TX  Configure SA bit used for transmission of SSM packets(4..8)
   --wait-to-restore  Amount of time before including a new clock source in clock  selection   (0..12
 min.)
```

"show" command

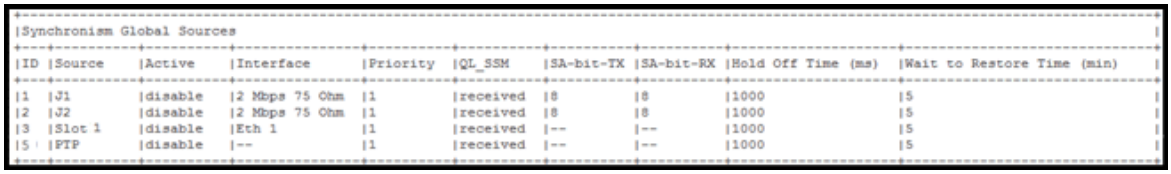
Table 610. "show" command information

Name	show
Description	Show the current services configuration. If a service ID is given shows all the downlink ports.
Full path	/synchronism/global/show
Mandatory Parameters	This command has no parameters
Screen Output	Tables Figure 710.Table parameters description in Table 611

Figure 709. CLI on line help on "show" command usage in this node context

```
/cli/synchronism/global/sources> show ?

Usage:
  SHOW          Show the current sources configuration
```

Figure 710.Output of ”show” command in this node context



```
Synchronism Global Sources
+---+---------+--------+-----------------+--------+--------+-----------+-----------+-----------------------+-----------------------------+
|ID |Source   |Active  |Interface        |Priority|QL_SSM  |SA-bit-TX  |SA-bit-RX  |Hold Off Time (ms)     |Wait to Restore Time (min)   |
+---+---------+--------+-----------------+--------+--------+-----------+-----------+-----------------------+-----------------------------+
|1  |J1       |disable |2 Mbps 75 Ohm    |1       |received|8          |8          |1000                   |5                            |
|2  |J2       |disable |2 Mbps 75 Ohm    |1       |received|8          |8          |1000                   |5                            |
|3  |Slot 1   |disable |Eth 1            |1       |received|--         |--         |1000                   |5                            |
|5  |PTP      |disable |--               |1       |received|--         |--         |1000                   |5                            |
+---+---------+--------+-----------------+--------+--------+-----------+-----------+-----------------------+-----------------------------+
```

Table 611. “show” command output table parameters

Parameter	Description
Source	Lists all possible interfaces (slots and junctions) for synchronization
Active	Allows a given synchronization source to be enabled or disabled.
Interface	This column allows selection of an n Ethernet interface, within a certain module, which can be used as a possible synchronization source. In the case of the junctions, it is possible to configure if this operates at 2MHz or 2Mbits
Priority	Allows setting the source priority. The lower the priority value, the greater the preference of this source over the others. Note that, for sources having equal priority, the concept of reversibility has no meaning.
QL-SSM	Quality Level; The user can select the intended SSM value for the source. This value overrides the value received by the equipment. When the SSM value is overridden, the following precautions should be taken: In case of interface LOS, this source is not used. If the received value is DNU, the equipment will continue to use this synchronization source.
SA-bit-Tx	Allows setting the value of the transmission Sa bit in the case of 2Mbps (only for the synchronization junctions);
SA-bit-Rx	Allows setting the value of the reception Sa bit in the case of 2Mbps (only for the synchronization junctions)
Hold-Off time (ms)	The Hold-Off time ensures that the activation, even if short, of the signal failure has no influence on the synchronization source selection process. This value can vary between 300ms and 1800ms
Wait-To-Restore time (min)	The Wait-To-Restore time ensures that a prior fault in the synchronization source will only be considered valid for this selection process if it is maintained without failure for a specified period of time. This parameter can have values ranging from 0 to 12 minutes with 1 minute resolution. The default value is 5 minutes.

“ptp” sub-node

“config” command

Table 612. "config" command information

Name	config
Description	Configure global PTP parameters
Full path	/synchronism/ptp/config
Mandatory Parameters	No
Screen Output	No

Figure 711. CLI on line help on "config" command usage in this node context

```
/cli/synchronism/ptp> config ?

Usage:
  CONFIG          Configure global PTP parameters

  [OPTIONAL]
  --clock-accuracy    Specify the clock Quality accuracy type
  --clock-class   Specify the default clock Quality class(0..255)
  --clock-type    Set the clock type (ordinary|boundary)
  --priority-1    Override criteria for best master clock selection (1..253)
  --priority-2    Specify a particular switch priority when criteria matches (1..253)
  --slave-only    Enables slave only configuration of the PTP machine (enable|disable)
  --two-step-clock Enables Two-step clock configuration of the PTP machine
   (enable|disable))
```

"show" command

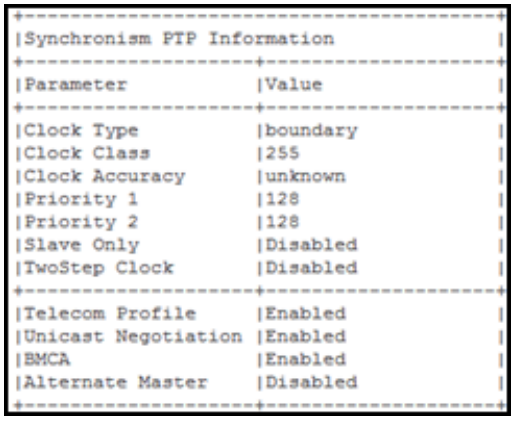
Table 613. "show" command information

Name	show
Description	Show the current global PTP configuration
Full path	/synchronism/ptp/show
Mandatory Parameters	This command has no parameters
Screen Output	Tables Figure 713.Table parameters description in Table 614

Figure 712. CLI on line help on "show" command usage in this node context

```
/cli/synchronism/ptp> show ?

Usage:
  SHOW          Show the current global PTP configuration
```

Figure 713.Output of ”show” command in this node context



Synchronism PTP Information	
Parameter	Value
Clock Type	boundary
Clock Class	255
Clock Accuracy	unknown
Priority 1	128
Priority 2	128
Slave Only	Disabled
TwoStep Clock	Disabled
Telecom Profile	Enabled
Unicast Negotiation	Enabled
BMCA	Enabled
Alternate Master	Disabled

Table 614. “show” command output table parameters

Parameter	Description
Clock Type	Indicates Clock Type
Clock Class	Indicates clock class
Clock Accuracy	Indicates clock accuracy
Priority1	Indicates override criteria for best master clock selection
Priority 2	Indicates the particular switch priority when criteria matches
Slave Only	Indicates if slave only configuration of the PTP machine is enabled
Two Step Clock	Indicates if two-clock configuration of the PTP machine is enabled
Telecom Profile	Indicates if Telecom profile is enabled
Unicast Negotiation	Indicates if Unicast negotiation is enabled
BMCA	Indicates if BMCA is enabled
Alternate Master	Indicates if alternate master is enabled

“showconfig” command

Table 615. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/synchronism/ptp/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 714. CLI on line help on “showconfig” command usage in this node context

```
/cli/synchronism/ptp> showconfig ?
```

```
Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

“port” sub-node

“availableValues” command

Table 616. "availableValues " command information

Name	availableValues
Description	Show the available values for configurable arguments.
Full path	/synchronism/ptp/port/availableValues
Mandatory Parameters	This command has no parameters
Screen Output	Table Figure 716.Table parameters description Table 617

Figure 715. CLI on line help on “availableValues” command usage in this node context

```
/cli/synchronism/ptp/port> availableValues ?

Usage:
  AVAILABLEVALUES Show the available values for configurable arguments.
```

Figure 716.Output of ”availableValues” command in this node context

```
+-------------------------------------------------------+
|Available Values for Synchronism PTP Port Entities     |
+-----+-------------------------------------------------+
|Slot |Port                                             |
+-----+-------------------------------------------------+
|1    |Eth 1, Eth 2                                     |
+-----+-------------------------------------------------+
```

Table 617. “availableValues” command output table parameters

Parameter	Description
Slot	Indicates the slot
Port	Indicates the OLT interface

“config” command

Table 618. "config" command information

Name	config

Description	Configure a specific PTP port.
Full path	/synchronism/ptp/port/config
Mandatory Parameters	--ID
Screen Output	No

Figure 717. CLI on line help on "config" command usage in this node context

```
/cli/synchronism/ptp/port> config ?

Usage:
 CONFIG        Configure a specific PTP port.

  <MANDATORY>
  --ID  Identifies a table entry by ID, in this context.

  [OPTIONAL]
  --admin   Administrative State. Enable/disable, in this context. (enable|disable)
  --announce-interval      Set the Announce message transmission interval
  --announce-receipt-timeout Set the Announce receipt timeout associated with this clock
   port(2..10 sec.)
  --delay-mechanism      Specify the delay mechanism used (end2end)
  --min-delay-req-interval      Set the delay-request minimum interval
  --peer-ip  Specify the PTP clock port Peer IP address
  --pkt-size Set the PTP config port packet size (86..1510 Bytes)
  --port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)
  --role      Specify the PTP clock port role (slave|master)
  --self-ip   Specify the PTP clock port Self IP address
  --slotIdentifies a slot. (not used for LAG)
  --sync-interval      Set the synchronism message transmission interval
  --vlan      Choose a VLAN ID.
```

"create" command

Table 619. "create" command information

Name	create
Description	Create a new PTP port.
Full path	/synchronism/ptp/port/create

Mandatory Parameters	--port
Screen Output	No

Figure 718. CLI on line help on "create" command usage in this node context

```
/cli/synchronism/ptp/port> create ?

Usage:
 CREATE        Create a new PTP port.

  <MANDATORY>
  --port      Identifies an interface on the OLT. (e.g.: pon.2; eth.3; lag.1)

  [OPTIONAL]
  --admin   Administrative State. Enable/disable, in this context.  (enable|disable)
  --announce-interval      Set the Announce message transmission interval
  --announce-receipt-timeout Set the Announce receipt timeout associated with this clock
   port(2..10 sec.)
  --delay-mechanism      Specify the delay mechanism used (end2end)
  --min-delay-req-interval      Set the delay-request minimum interval
  --peer-ip  Specify the PTP clock port Peer IP address
  --pkt-size Set the PTP config port packet size (86..1510 Bytes)
  --role      Specify the PTP clock port role (slave|master)
  --self-ip   Specify the PTP clock port Self IP address
  --slotIdentifies a slot. (not used for LAG)
  --sync-interval      Set the synchronism message transmission interval
  --vlan      Choose a VLAN ID.
```

"remove" command

Table 620. "remove" command information

Name	remove
Description	Remove an existing PTP port
Full path	/synchronism/ptp/port/remove
Mandatory Parameters	--ID
Screen Output	No

Figure 719. CLI on line help on “remove” command usage in this node context

```
/cli/synchronism/ptp/port> remove ?

Usage:
  REMOVE         Remove an existing PTP port.

   <MANDATORY>
   --ID                          Identifies a table entry by ID, in this context.
```

“show” command

Table 621. "show" command information

Name	show
Description	Show the current PTP port configuration.
Full path	/synchronism/ptp/port/show
Mandatory Parameters	No
Screen Output	Table Figure 721.Table parameters description in Table 622.

Figure 720. CLI on line help on “show” command usage in this node context

```
/ /cli/synchronism/ptp/port> show ?

Usage:
  SHOW          Show the current PTP port configuration

   [OPTIONAL]
   --ID  Identifies a table entry by ID, in this context.
```

Figure 721.Output of ”show” command in this node context

```
+---------------------------------------------------------------------------------------------------------------------------------------+
|Synchronism PTP Port                                                                                                                   |
+---+-------+---------+------+----------------+----------------+--------+-------------+-------------------+---------+---------+-----------+
|ID |Admin  |NNI-STAG |Role  |Self IP         |Peer IP         |Pkt Size|Ann. Interval|Ann. Recp. Timeout|Sync     |Min Delay|Delay Mech.|
+---+-------+---------+------+----------------+----------------+--------+-------------+-------------------+---------+---------+-----------+
+---+-------+---------+------+----------------+----------------+--------+-------------+-------------------+---------+---------+-----------+
```

Table 622. “show” command output table parameters

Parameter	**Description**
ID	Identifies a PTP port by ID
Admin	Indicates PTP port administrative state

NNI-STAG	Indicates Outer VLAN ID (service) on the network-facing (Ethernet) interface.
Role	Indicates if the PTP port acts as a slave or as a master
Self IP	Indicates the origin PTP port IP address
Peer IP	Indicates the destination PTP port IP address
Pkt Size	Indicates the PTP configuration port packet size
Ann. Interval	Indicates the announce message transmission interval
Ann.Recp Timeout	Indicates the announce receipt timeout.
Sync	Indicates the synchronism message transmission interval
Min Delay	Indicates the minimum delay request interval
Delay Mech	Indicates the used delay mechanism

"showconfig" command

Table 623. "showconfig" command information

Name	showconfig
Description	Print the command list that enforces the current configuration
Full path	/synchronism/ptp/port/showconfig
Mandatory Parameters	This command has no parameters
Screen Output	Full command(s) path and used arguments and values to reach the current configuration.

Figure 722. CLI on line help on "showconfig" command usage in this node context

```
/cli/synchronism/ptp/port> showconfig ?

Usage:
  SHOWCONFIG      Print the command list that enforces the current configuration
```

"ip-access-list" sub-node

"config" command

Table 624. "config" command information

Name	config
Description	Configure.
Full path	/synchronism/ptp/port/ip-access-list/config
Mandatory Parameters	--olt-ptp-port-ID
Screen Output	No

Figure 723. CLI on line help on "config" command usage in this node context

```
/cli/synchronism/ptp/port/ip-access-list> config ?

Usage:
 CONFIG        Configure

  <MANDATORY>
  --olt-ptp-port-ID   Identify one OLT PTP port instance by ID.

  [OPTIONAL]
  --gw-ip   Set the gateway IP address
  --ip-address   IPv4 address
  --ip-maskIPv4 Subnet Mask
  --role      Set the access list entry role (allow|deny
```

"create" command

Table 625. "create" command information

Name	create
Description	Create.
Full path	/synchronism/ptp/port/ip-access-list/create
Mandatory Parameters	--olt-ptp-port-ID
Screen Output	No

Figure 724. CLI on line help on "create" command usage in this node context

```
/cli/synchronism/ptp/port/ip-access-list> create ?

Usage:
 CREATE        Create

  <MANDATORY>
  --olt-ptp-port-ID   Identify one OLT PTP port instance by ID.

  [OPTIONAL]
  --gw-ip   Set the gateway IP address
```

```
--ip-address    IPv4 address
--ip-maskIPv4 Subnet Mask
--role      Set the access list entry role (allow|deny)
```

"remove" command

Table 626. "remove" command information

Name	remove
Description	Remove
Full path	/synchronism/ptp/port/ip-access-list/remove
Mandatory Parameters	--olt-ptp-port-ID
Screen Output	No

Figure 725. CLI on line help on "remove" command usage in this node context

```
/cli/synchronism/ptp/port/ip-access-list> remove ?

Usage:
 REMOVE         Remove

 <MANDATORY>
 --olt-ptp-port-ID    Identify one OLT PTP port instance by ID
```

"show" command

Table 627. "show" command information

Name	show
Description	Show the current PTP port configuration.
Full path	/synchronism/ptp/port/ip-access-list/show
Mandatory Parameters	This command has no parameters
Screen Output	Table, Figure 727.Table parameters description in Table 628.

Figure 726. CLI on line help on "show" command usage in this node context

```
/cli/synchronism/ptp/port/ip-access-list> show ?

Usage:
```

```
SHOW          Show the current configuration
```

Figure 727.Output of ”show” command in this node context

```
+-------------------------------------------------------------------------------+
|PTP Port IP Access List                                                        |
+---+-------------+----------+-----------+-----------+-----------+-------------+
|ID |Admin        |PTP Port  |IP         |Mask       |GW         |Role         |
+---+-------------+----------+-----------+-----------+-----------+-------------+
+---+-------------+----------+-----------+-----------+-----------+-------------+
```

Table 628. “show” command output table parameters

Parameter	Description
ID	Identifies a PTP port by ID
Admin	Indicates PTP port administrative state
PTP port	Indicates Outer VLAN ID (service) on the network-facing (Ethernet) interface.
IP	Indicates PTP port IPv4 address
Mask	Indicates PTP port IPv4 Mask
GW	Indicates IPv4 address of the Gateway to the destination network
Role	Indicates if the PTP port acts as a slave or as a master

“status” sub-node

“global” sub-node

“command” command

Table 629. "command" command information

Name	command
Description	Execute a command on a given source.
Full path	/synchronism/status/global/command
Mandatory Parameters	--type
Screen Output	No

Figure 728. CLI on line help on “config” command usage in this node context

```
/cli/synchronism/status/global> command ?

Usage:
  COMMAND       Execute a command on a given source.
```

<MANDATORY>

--type choose the command type. 'clear' commands don't need the 'slot' argument. (manual-switch|force-switch|clear)

[OPTIONAL]

--slotIdentifies a slot. (not used for LAG)

"show" command

Table 630. "show" command information

Name	show
Description	Show the global status information
Full path	/synchronism/status/global/show
Mandatory Parameters	This command has no parameters.
Screen Output	Table, Figure 730. Table parameters description in Table 631

Figure 729. CLI on line help on "show" command usage in this node context

```
/cli/synchronism/status/global> show ?

Usage:
  SHOW          Show the global status information
```

Figure 730. Output of "show" command in this node context

```
+-------------------------------------------------------------------------------------------------------------------+
|Synchronism Status Global                                                                                          |
+-------------+-------------+----------------+-------------------+----------+-----------------------------------+
|Quality Level|Active Source|Nbr Of Junctions|PLL Status         |Lock Alarm|Available Commands                 |
+-------------+-------------+----------------+-------------------+----------+-----------------------------------+
|enabled      |--           |2               |freerun            |Not locked|manual-switch / force-switch / clear|
+-------------+-------------+----------------+-------------------+----------+-----------------------------------+
```

Table 631. "show" command output table parameters

Parameter	Description
Quality level	May be enabled or disabled
Active Source	Synchronization source (slot or junction number) of the respective PLL;
Nr. of Junctions	Number of synchronism junctions
PLL Status	Equipment system PLL is controlled by a state machine according to G.781 recommendation and can have one of the following status: **Hold Over**: The PLL will switch to this status if it ceases to be a valid synchronization source. This status provides a stable synchronization clock based on the original clock memorization; **Free Run**: The PLL is synchronized by the local clock; **Normal**: The PLL is synchronized by the programmed synchronization source

Lock alarm	This alarm is triggered when the PLL is not locked
Command	There are several external commands that are available to the user, for example for maintenance purposes commands. These commands are independent and have different impacts on the selection processes. Enabling and disabling external commands associated with the synchronization selection process is defined below. Only one of these external commands is enabled by the selection process at a time. It is possible to carry out the following commands in the active synchronism sources, **Clear** **Manual Switch** **Force Switch**

"sources" sub-node

"command" command

Table 632. "command" command information

Name	command
Description	Execute a command on a synchronism source.
Full path	/synchronism/status/global/sources/command
Mandatory Parameters	--ID --type
Screen Output	No

Figure 731. CLI on line help on "command" command usage in this node context

```
/cli/synchronism/status/global/sources> command ?

Usage:
 COMMAND       Execute a command on a synchronism source.

  <MANDATORY>
  --ID  Identifies a table entry by ID, in this context.
  --type    Enable/clear a lockout configuration on the specified clock source
   (clear|lockout)
```

"show" command

Table 633. "show" command information

Name	show
Description	Show the status information
Full path	/synchronism/status/global/sources/show

Mandatory Parameters	This command has no parameters.
Screen Output	Table,Figure 733. Table parameters description in Table 634

Figure 732. CLI on line help on "show" command usage in this node context

```
/cli/synchronism/status/global/sources> show ?

Usage:
  SHOW          Show the status information.
```

Figure 733. Output of "show" command in this node context

```
+-------------------------------------------------------------------+
|Synchronism Status Sources                                         |
+---+----------+----------+----------+-----------+-----------------+
|ID |Source    |SSM RX    |SSM Used  |Signal Fail|Attenuation (dB)|
+---+----------+----------+----------+-----------+-----------------+
+---+----------+----------+----------+-----------+-----------------+
```

Table 634. "show" command output table parameters

Parameter	Description
ID	Indicates synchronization source
Source	Indicates synchronization source (slot or junction number)
SSM Rx	This column identifies the received SSM (Synchronization Status Message);
SSM Used	This column identifies the used SSM
Signal Fail	Signal failure of the respective synchronism source
Attenuation	Attenuation (measured in dB) associated with each of the existing synchronism junctions

"ptp" sub-node

"show" command

Table 635. "show" command information

Name	show
Description	Show the current status information
Full path	/synchronism/status/ptp/show
Mandatory Parameters	This command has no parameters.
Screen Output	Table, Figure 735. Table parameters description in Table 636

Figure 734. CLI on line help on “show” command usage in this node context

```
/cli/synchronism/status/ptp> show ?

Usage:
  SHOW          Show the current status information
```

Figure 735. Output of ”show” command in this node context

```
+-----------------------------------------------------------------------------+
|Synchronism PTP Status                                                       |
+-----------------------------------------------+-----------------------------+
|Parameter                                      |Value                        |
+-----------------------------------------------+-----------------------------+
|Clock                                          |                             |
|   PLL Status                                  |--                           |
|   Packets Received                            |0                            |
|   Packets Sent                                |0                            |
+-----------------------------------------------+-----------------------------+
|Default DS                                     |                             |
|   Clock Identity                              |00:00:00:00:00:00:00:00      |
|   TwoSetpFlag                                 |False                        |
|   Priority1                                   |0                            |
|   Priority2                                   |0                            |
|   SlaveOnly                                   |False                        |
|   Clock Class                                 |0                            |
|   Clock Accuracy                              |0                            |
|   Offset Scaled Log Variance                  |0                            |
+-----------------------------------------------+-----------------------------+
|Parent DS                                      |                             |
|   Clock Identity                              |00:00:00:00:00:00:00:00      |
|   Port Number                                 |0                            |
|   Observed Offset Scaled Phase Log Variance   |--                           |
|   Observed Clock Phase Change Rate            |--                           |
|   Grand Master Clock Identity                 |00:00:00:00:00:00:00:00      |
|   Grand Master Priority1                      |0                            |
|   Grand Master Priority2                      |0                            |
|   Grand Master Clock Class                    |0                            |
|   Grand Master Clock Accuracy                 |0                            |
|   Grand Master Offset Scaled Log Variance     |0                            |
+-----------------------------------------------+-----------------------------+
```

Table 636. “show” command output table parameters

Parameter Group	Parameter	Description
Clock	PLL Status	
	Packets Received	
	Packets Sent	
Default DS	Clock Identity	
	TwoStepFlag	Two-step clock configuration of the PTP machine (enable|disable)
	Priority 1	Override criteria for best master clock selection (1..253)
	Priority 2	Particular switch priority when criteria matches (1..253)
	SlaveOnly	Slave only configuration of the PTP machine (enable|disable)
	Clock Class	Default clock Quality class(0..255)
	Clock Accuracy	Clock Quality accuracy type
	OffSet Scaled Log Variance	
Parent DS	Clock Identity	
	Port Number	

Observed OffSet Scaled Log Variance	
Observed Clock Phase Change Rate	
Grand Master Clock Identity	
Grand Master Priority 1	Override criteria for best master clock selection (1..253)
Grand Master Priority 2	Particular switch priority when criteria matches (1..253)
Grand Master Clock Class	Default clock Quality class(0..255)
Grand Master Clock Accuracy	Clock Quality accuracy type
Grand Master OffSet Scaled Log Variance	

"users" node

Figure 736."users" node tree

```
/cli/users> tree
+ users[@config, @create, @remove, @show, @status]
```

"config" command

Table 637. "config" command information

Name	config
Description	Configure an existing user login
Full path	/users/config
Mandatory Parameters	--change-passwd[=STRING] --login
Screen Output	No

Figure 737. CLI on line help on "config" command usage in this node context

```
/cli/users> config ?

Usage:
 CONFIG        Configure an existing user login.

  <MANDATORY>
  --change-passwd[=STRING]     Trigger a password change
  --login     User's login

  [OPTIONAL]
  --auto-removal      User's auto-removal (enable|disable)
```

```
--expire-time  User's expire time (hours)
--permissions User's permissions
--renew    Renew expired user (enable)
```

“create” command

Table 638. "create" command information

Name	create
Description	Create a new user login..
Full path	/services/create
Mandatory Parameters	--login --permissions
Screen Output	No

Figure 738. CLI on line help on “create” command usage in this node context

```
/cli/users> create ?

Usage:
 CREATE         Create a new user login.

  <MANDATORY>
  --login     User's login
  --permissions User's permissions

  [OPTIONAL]
  --auto-removal      User's auto-removal (enable|disable)
  --expire-time  User's expire time (hours)
```

“remove” command

Table 639. "remove" command information

Name	remove
Description	Remove an existing user login
Full path	/users/remove
Mandatory Parameters	--login
Screen Output	No

Figure 739. CLI on line help on “remove” command usage in this node context

```
/cli/users> remove ?

Usage:
 REMOVE        Remove an existing user login.

 <MANDATORY>
 --login     User's login.
```

“show” command

Table 640. "show" command information

Name	show
Description	Show the current users login configuration.
Full path	/users/show
Mandatory Parameters	This command has no parameters
Screen Output	Table Figure 741.Table parameters description inTable 641.

Figure 740. CLI on line help on “show” command usage in this node context

```
/cli/users> show ?

Usage:
 SHOW          Show the current users login configuration..
```

Figure 741.Output of ”show” command in this node context

```
+-------------------------------------------------------------------+
|Users Configurations                                               |
+---------------+---------------+---------------+-----------------+
|Login          |Permissions    |Auto-Removal   |Timeout          |
+---------------+---------------+---------------+-----------------+
|admin          |administrator  |--             |--               |
|standard       |poweruser      |--             |--               |
|guestuser      |guest          |--             |--               |
|Daniel         |guest          |enabled        |1 hours          |
|Teste          |guest          |--             |1 hours          |
|Teste2         |guest          |--             |1 hours          |
+---------------+---------------+---------------+-----------------+
```

Table 641. “show” command output table parameters

Parameter	Description
Login	Identifies a user by Users’ login

Permissions	Indicates the user's permissions
Auto-Removal	Indicates if user's auto-removal feature is enabled or disabled
Timeout	Indicates the user's login expire time

"status" command

Table 642. "status" command information

Name	status
Description	Show the current users login configuration.
Full path	/users/status
Mandatory Parameters	This command has no parameters
Screen Output	Table Figure 743.Table parameters description in Table 643.

Figure 742. CLI on line help on "status" command usage in this node context

```
/cli/users> status ?

Usage:
  STATUS        Show the current users login status.
```

Figure 743.Output of "status" command in this node context

```
+-----------------------------------------------+
|Users Status                                   |
+---------------+---------+--------------------+
|Login          |Active   |Remaining Time      |
+---------------+---------+--------------------+
|admin          |active   |--                  |
|standard       |active   |--                  |
|guestuser      |active   |--                  |
|Daniel         |inactive |--                  |
|Teste          |inactive |--                  |
|Teste2         |inactive |--                  |
+---------------+---------+--------------------+
```

Table 643. "status" command output table parameters

Parameter	Description
Login	Identifies a user by Users' login
Active	Indicates if the user is active
Remaining Time	Indicates the remaining time till the user's login expires

Chapter 8
TROUBLESHOOTING

This chapter describes the most common problems on the ME4605 OLT equipment configuration and operation and the procedures to handle these via WEBTI local management interface.

COMMON PROBLEM HANDLING

Table 644. Common problem handling list

Problem description	Possible Cause(s)	Procedure
WEBTI window incorrect display	• The browser you are using is not internet explorer • You are using the internet explorer without compatibility view configured • The equipment you are accessing with the WEBTI local management is not in the Explorer compatibility view list.	Use internet explorer browser with compatibility mode to access the equipment via local management WebTi interface; Please refer to Chaper 5 CONFIGURATION, section CONFIGURATION THE WEB BROWSER.
The ONU is an ONT-RGW , the VoIP interface was selected at OLT ONU configuration tables, but VoIP is not working properly at the client side	If the ONU is an ONT-RGW, VoIP is not configured at the OLT but it is configured at the ONT-RGW GUI (Graphical User Interface);	Please refer to Cisco ME4600 Gateway Family user manual for the VoIP service configuration.
While making a service configuration at the ONT-RGW, the OLT ONU configuration table is not available	The most common cause for this issue is the interface associated to the service was one of the ETH ONT-RGW interfaces	Any service configured at the ONT-RGW must have as associated interface the VEIP (Virtual Ethernet Interface Port) OLT configuration tables for this ONT-RGW at the Services tables, for the service not working, select the view link at the details column to view the service configuration details, at the port configuration verify is VEIP is the associated port; if not correct it.
An ONU equipment just added is shown in status absent a few seconds afterwards	--	Use refresh button to force the update of the window
A configured multicast service is not working	• A an unicast service associated to the multicast service (with the same UNI-C-VLAN used for the Multicast service) must always be configured for the IGMP messages • The Multicast Group List was not configured • The IGMP Proxy is not enabled.	• At the Configuration menus item services, verify at the services table that a unicast service exists configured with the same UNI-C-TAG as the multicast service, with IGMP flag selected and that is administratively up. If such service does not exist or not correctly configured change its configuration and save it. • Go to Configuration, Multicast, Group List and add the multicast groups needed for that service • Go to Configuration, Multicast, Proxy and enable it.
You have just upgraded the OS of your OLT and are trying to configure admin up or down an uplink port and receive the following error message: 0703010A::NULL message received from client applications	--	Close the browser and clean the cache.

EQUIPMENT ERROR CODES

Table 645. Equipment Error Codes List

Equipment Error Code (hexadecimal)	Description
0x08030001	Unavailable resources for counter activation
0x08030006	Unavailable resources for the service in the OLT
0x08030100	Service has active probe or counter
0x08XXXXXX 0x69XXXXXX	Equipment firmware error (XX means any value)
0x07XXXXXX	Internal Equipment Error (IPC Error) (XX means any value)
0x0A03000E	Invalid Operational State
0x0A030113	The proposed serial number already exists.
0x0A030114	ONTs list is updating
0x0A030115	The serial number is invalid.
0x0A030117	The password is being used by another ONU
0x0A030118	Register type is invalid.
0x0D030100	The minimum distance is greater than the maximum
0x0D030101	The difference between minimum and maximum distance is greater than allowed
0x0D030102	There are ONTs connected to the PON port which do not allow it to be disabled
0x0D030103	FEC Downstream is not enabled on the PON port
0x0D030104	FEC Upstream is not enabled on the ONT
0x0D030105	The PON port has ONTs with services
0x0D030106	The PON port is used in unstacked services with different MAC Bridge type
0x0D030107	The PON port is in VLAN mapping mode
0x0D030108	The PON port is in VLAN + P-Bit mapping mode
0x0D034320	Invalid protection group administrative state
0x0D034321	Invalid protection group mode
0x0D034322	Invalid protection group reversibility
0x0D034323	Invalid protection group 'wait to restore' value
0x0D034324	Invalid protection group 'hold-off timer' value
0x0D034325	Invalid protection group primary port
0x0D034326	Invalid protection group protection port
0x0D034327	Protection group primary port is not active
0x0D034328	Protection group protection port is active
0x0D034330	The ports of the protection group cannot be the same
0x0D034331	The protection group is active 0x0D034332 The protection group is not active
0x0D034333	The protection group entity ID already exists
0x0D034334	Port in use by a protection group
0x0D034335	Protection port has ONUs

0x0D034336	Protection port has services
0x0D034337	The protection and working ports of the protection group belong to the same card
0x0D034338	The protection is being activated/deactivated or sinchronyzing
0x0D034339	The protection information is not synchronized
0x0D034891	Service is in use on a Multicast Channel
0x0D03489A	There is at least one ACL associated to the service
0x0D0348A0	There is at least one probe associated to the service
0x1D030303	Incompatible hardware version
0x1D034880	Invalid ID
0x1D034881	Invalid Admin
0x1D034882	Invalid Type
0x1D034883	Invalid Client Port
0x1D034884	Not enough resources to active ONU counter. Max nbr reached
0x1D034886	The respective OLT service is not admin enabled
0x1D034890	Only inactive services can be removed
0x1D034891	UNI-C-Tag already in use by another service in this ONU
0x1D034893	Only one multicast service is allowed per ONU
0x1D034894	Network Service already associated with another Client Service (same ONU).
0x1D034895	NNI C-Tag is in use by another ONU
0x1D034896	NNI C-Tag < min
0x1D034897	NNI C-Tag > max
0x1D034898	MAX service num
0x1D034899	(multicast) NNI C-Tag cannot be zero
0x1D03489A	The NNI C-TAG can't be 0 for unicast stacked services
0x1D03489B	service has attached ONU interface(s)
0x1D03489C	OLT service does not include this ONU interface
0x1D03489D	service has attached interfaces(s)
0x1D03489F	Reached Maximum nbr of downstream services for this Slot
0x1D0348B0	max Upstream BW
0x1D0348BA	VoIP services can only have VoIP interfaces
0x1D0348BB	VoIP services must have at least one VoIP interface
0x1D0348BC	The unicast service associated is admin disabled 0x1D0348BD The multicast service associated is admin enabled
0x1D0348BE	Invalid DHCP configurations
0x1D0348BF	Invalid remote-id string
0x1D0348C0	Unable to configure more than one unicast IGMP service per ONU
0x1D0348C1	No unicast IGMP service for this ONU
0x1D0348C2	No active unicast IGMP service for this ONU
0x1D0348C3	IP Management can only be configured for unicast services
0x1D0348C4	Requested ONU cannot have more than one service with IP Management
0x1D0348C5	Encryption flag cannot be used in multicast services
0x1D0348C6	All multicast services must be deactivated prior to deactivating the unicast IGMP service

0x1D0348C7	Unable to remove service Bridge master until the remaing Bridge services are removed
0x1D0348C8	Unable to configure a downstream traffic profile on unstacked services
0x1D0348C9	NNI C-Tag is used by another Client Service associated with a Network Service with the same NNI S-Tag
0x1D0348CA	The selected ethernet profile does not exist
0x1D0348CB	The selected upstream profile does not exist
0x1D0348CC	The service has no T-CONTs mapping
0x1D0348CD	The service has T-CONTs mapping
0x1D0348CE	Invalid PCP profile
0x1D035010	Duplicated Client Service referencing the same Unstacked Network Service on this Interface
0x1D035011	Requested NNI C-Tag does not match the remaining ONUs assoc iated with the same N:1 Bridge OltService
0x1D035012	EthernetProfileId MUST match for all OntServices that belong to the same ONU and N:1 Bridge OltService
0x1D035013	EthernetProfileId MUST match for all OntServices that belong to the same card and 1:1 Bridge OltService
0x1D035014	Client Service has no interface associated
0x1D035015	Unstacked Services: Duplicated UNI C-TAG --Stacked Services: UNI C-TAG cannot duplicate NNI C-TAG
0x1D035016	Duplicated UNI-CTAG for the chosen service type
0x1D035020	The network service has no IGMP
0x1D035021	IGMP override flag cannot be done on active service 0x1D035030 Maximum number of MACs out of range
0x1D035031	Maximum number of MACs not supported for service type
0x1D035032	Extended VLAN tagging is active in a service port
0x1D035033	The service is referenced by Extended VLAN tagging rules
0x1D039211	The upstream profile can't be changed with upstream profiles
0x1D039212	The type of the upstream traffic profile is invalid
0x1D039213	Invalid parameter for upstream traffic profile
0x1D039214	Empty String for Profile name
0x1D039215	The specified ONU profile ID does not exist
0x1D039216	The specified ONU profile ID is not ADMIN Enabled
0x1D039230	Invalid T-CONT admin state
0x1D039231	Invalid upstream profile
0x1D039240	The T-CONT is active
0x1D039241	The internal ALLOC ID pool is exhausted
0x1D039242	The T-CONT is being used by a service
0x1D039250	Invalid T-CONT ID
0x1D039251	Invalid client service ID for T-CONT mapping
0x1D039252	Invalid priority for T-CONT mapping
0x1D039260	The specified priority does not exist on the P-Bit profile of the PON
0x1D039261	The Service has an upstream profile
0x1D039262	Invalid T-CONT admin state
0x1D03A400	Invalid rule admin state
0x1D03A401	Invalid outer priority filter

0x1D03A402	Invalid inner priority filter
0x1D03A403	Invalid inner VID filter
0x1D03A404	Invalid outer VID filter
0x1D03A405	Invalid inner TPID filter
0x1D03A406	Invalid outer TPID filter
0x1D03A407	Invalid ethertype filter
0x1D03A408	Invalid number of tags to remove
0x1D03A409	Invalid inner priority action
0x1D03A40A	Invalid outer priority action
0x1D03A40B	Invalid inner VID action
0x1D03A40C	Invalid outer VID action
0x1D03A40D	Invalid inner TPID action
0x1D03A40E	Invalid outer TPID action
0x1D03A40F	Invalid client service
0x1D03A410	The rule is active
0x1D03A411	Duplicate filter
0x1D03A420	Invalid enable value
0x1D03A421	Invalid association type
0x1D03A422	Invalid associated entity ID
0x1D03A423	Invalid input TPID
0x1D03A424	Invalid output TPID
0x1D03A425	Invalid DSCP to P-Bit mapping profile
0x1D03A430	The port has services
0x1E034893	For unicast/multicat services the pair service type/uni-vlan has to be unique in the OLT
0x1E0348DD	Stacked services can only have one uplink port
0x1E034901	UNI C-Tag already in use in the NNI S-Tag of a non-multicast network service
0x1E034902	UNI C-Tag já em uso na NNI S-Tag dum serviço de rede multicastUNI C-Tag already in use in the NNI S-Tag of a multicast network service
0x1E039213	Invalid parameters in the configuration Upstream profile
0x21030300	Static groups end point value not valid
0x21030301	Cannot change static group end point - there is at least one static active group list entry.
0x50034896	Only 32 bits mask is allowed in static groups
0x5D030101	Invalid Downlink interface
0x5D030102	Multicast service interface is not mapped in any of the associated unicast services interfaces
0x5D030103	Unicast service interface is a member of a UC/MC association
0x5D030104	Invalid interface Role
0x5D030105	Invalid Admin State
0x5D030106	Invalid uplink interface
0x5D030107	Invalid downlink interface
0x5D030108	Interface and NNI S-TAG already used in synchronism
0x5D034850	The service must contain at least one uplink interface
0x5D034850	The service must contain at least one uplink interface

0x5D034851	The service must contain at least two interfaces (uplink+downlink)
0x5D034852	Stacked services cannot have multiple uplink interfaces
0x5D034853	Unable add this interface because an active PTP entry with the same NNI S-TAG already exists
0x5D034854	Selected port belongs to an invalid card for this service type
0x5D034854	Selected port belongs to an invalid card for this service type
0x5D034860	Stacked services for this service type, must contain only one uplink port
0x5D034861	Selected port belongs to a Static Probe
0x54030103	There is already an entry with the same service/mac
0x5A030103	Invalid IP address for active probe
0x60030104	Unknown parameter in the circuit ID string
0x65030101	Invalid ACL id
0x65030102	Invalid ACL administrative state
0x65030103	Invalid ACL type
0x65030104	ACL is used on a rule
0x65030105	ACL is used on an interface
0x65030106	ACL is used on a service
0x65030107	Invalid ACL rule administrative state
0x65030108	Invalid ACL rule action
0x65030109	Invalid ACL rule ethernet type
0x65030110	Invalid ACL rule CoS
0x65030111	Invalid ACL rule IP protocol
0x65030112	Invalid ACL rule port
0x65030113	Invalid ACL rule DSCP
0x65030114	Invalid ACL rule precedence
0x65030115	Invalid ACL rule flow label
0x65030116	Maximum number of rules per ACL reached
0x65030117	Cannot remove/disable the last rule for an ACL with enabled associations
0x65030118	ACL interface association: invalid administrative state
0x65030119	ACL interface association: invalid direction
0x65030120	ACL interface association: invalid interface id
0x65030121	ACL interface association: invalid ACL id
0x65030122	ACL interface association: invalid interface id
0x65030123	ACL interface association: invalid ACL id
0x65030124	ACL service association: invalid administrative state
0x65030125	ACL service association: invalid direction
0x65030126	ACL service association: invalid ACL id
0x65030127	ACL service association: invalid network service id
0x65030128	ACL service association: service is not active
0x66030101	Invalid Interface for IP Source Guard
0x66030102	Invalid Admin State
0x66030103	Invalid IP Version
0x66030104	The associated Network Service must be enabled
0x66030105	Unknown Network Service.

0x66030106	Cannot change admin enabled entities
0x66030107	Interface must be active
0x66030108	Interface must be IP Source Guard Enabled (interface configuration)
0x66030109	Interface must belong the NS downlink port list
0x6603010A	Interface must belong the NS downlink card list.
0x6603010B	MAC cannot be full zeros

GLOSSARY OF TERMS AND ABBREVIATIONS

AES	Advanced Encryption Standard
ARP	Address Resolution Protocol
BMCA	Best Master Clock Algorithm
CCM	Continuity Check Message
CDP	Cisco Discovery Protocol
CFM	Connectivity Fault Management
C-Tag	Client Tag
CWDM	Coarse Wavelength Division Multiplexing
DBA	Dynamic Bandwidth Allocation
DHCP	Dynamic Host Configuration Protocol
DMAC	Destination MAC address
E1	European digital transmission format 1
ETH	Ethernet
ETSI	European Telecommunications Standards Institute
FEC	Forward Error Correction
FSAN	Full Service Access Network
GbE	Giga bit Ethernet
GEM	GPON Encapsulation Mode
GPON	Gigabit-capable Passive Optical Network

ICC	ITU-T Carrier Code
ID	Identification
IEEE	Institute of Electrical and Electronics Engineers
IGMP	Internet Group Management Protocol
IP	Internet Protocol
IPTV	Internet Protocol Television
L2	Layer 2 - Data Link Layer
LACP	Link Aggregation Control Protocol
LACPDU	Link Aggregation Control Protocol Data Unit
LAG	Link Aggregation Group
LC/PC	LC/PC Fiber Optic Connector
MAC	Media Access Control
MAID	Maintenance Association Identifier. An identifier for a Maintenance Association, unique over the OAM domain. The MAID has two parts: the MD Name and the Short MA Name. A MAID is equivalent to the ITUs term MEG ID.
MD	Maintenance Domain. The part of a network for which faults in connectivity can be managed.
ME	Maintenance Entity. A point-to-point relationship between two MEPs within a single MEG.
MEG	Maintenance Entity Group. Equivalent to a Maintenance Association (MA). A set of MEs that exist in the same administrative boundary, with the same MEG Level and MEG ID.
MEG ID	Maintenance Entity Group Identifier. Equivalent to the IEEE term Maintenance Association Identifier (MAID). An identifier for a MEG, unique over the domain that SOAM is to protect against the accidental concatenation of service instances.

MEP	Maintenance association End Point [IEEE 802.1ag], or equivalently MEG End Point [ITU-T Y.1731]. An actively managed SOAM entity associated with a specific service instance that can generate and receive SOAM PDUs and track any responses. It is an end point of a single MEG, and is an endpoint of a separate Maintenance Entity for each of the other MEPs in the same MEG.
MSA	Multi Source Agreement
MTU	Maximum Transmission Unit
ODN	Optical Distribution Network
OLT	Optical Line Terminal
OMCI	ONT Management Control Interface
ONT	Optical Network Terminal
ONU	Optical Network Unit
OSPF	Open Shortest Path First adaptive routing protocol
PON	Passive Optical Network
PDU	PDU Protocol Data Unit
PDV	Packet Delay Variation
QoS	Quality of Service
RF	Radio Frequency
RG	Residential Gateway
RIP	Routing Information Protocol
RMEP	Remote MEP
NG-PON	Next Generation Passive Optical Network
SC/APC	SC/APC Fiber Optic Connector
SC/PC	SC/PC Fiber Optic Connector
SDH	Synchronous Digital Hierarchy
SFP	Small Form-factor Pluggable transceiver

SONET	Synchronous Optical Networking
S-Tag	Service Tag
STP	Spanning Tree Protocol
TLS	Transparent LAN Services
T-CONT	Traffic Container
TWDM	Time domain and Wavelength Division Multiplexing
UMC	Unique MEG-ID code
USB	Universal Serial Bus
UTP	Unshielded Twisted Pair
VLAN	Virtual Local Area Network
VoIP	Voice over Internet Protocol
XFP	10 Gigabit Small Form Factor Pluggable transceiver
XGPON	Extra Large Gigabit Passive Optical Network