

MicroClimate™ Management System [MCMS] **PON Manager (WebUI) User Guide**



WARNING !

Refer to Install Guide before Installation

Warranty Notice: Device Attenuation Required

Do not connect OLT directly to ONUs without proper attenuation. PON transceivers will be **permanently damaged** unless connected with minimum 16dB attenuation (20dB recommended)
Damage from optical overload will void warranty.

Combination of attenuator and splitters can provide required attenuation -- see example:

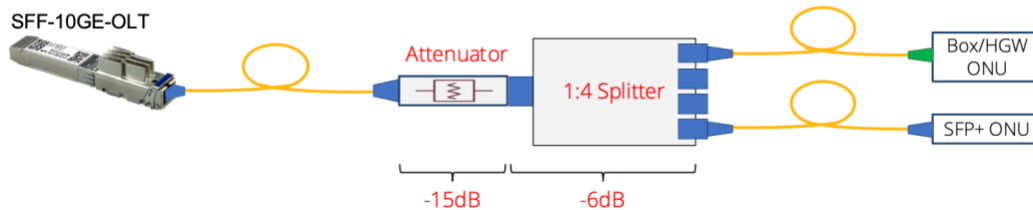


Table of Contents

Document Purpose	8
Introduction	9
MCMS PON Manager	10
MCMS Netconf Server	10
MCMS PON Controller	11
MongoDB Datastore	11
Architecture Overview	12
MCMS PON Manager Web Application	13
MCMS PON Manager Web Server	13
MongoDB	13
Security	14
Role Based Access Control	14
HTTPS	14
Authentication	14
Session Expiration	15
Session Purging	15
System Diagrams	16
Web Interface	18
Logging In for the first time	18
Creating and Managing Accounts	18
Password Requirements	19
Logging Out	19
Version	19
Site Customization	20
Site Navigation	20
Auto Refresh	21
Dashboard	22
Alarms Summary	22
Network	23

Devices	23
Device Navigation Tree	24
Hierarchy View	25
PON Controller	26
Summary	26
Identification	27
Configure Controller Name	27
Configure Controller Picture	27
Firmware	28
Authentication	28
OLT Inventory	29
Add OLT to Inventory	30
Remove OLT from Inventory	30
Monitoring	30
Operations	32
Pause a Controller	32
Shutdown a Controller	33
Delete a Controller	33
Switch	33
Summary	33
Identification	33
Configure Switch Name	34
Configure Switch Picture	34
OLT Inventory	34
Add OLT to Inventory	36
Remove OLT from Inventory	36
Operations	36
Delete a Switch	36
OLT	37
Summary	37
Identification	38

Configure OLT Name	38
Configure OLT Picture	38
Firmware	38
OLT Firmware	38
Upgrade OLT Firmware	39
Disable OLT Firmware Upgrade	39
ONU Firmware	39
Services	40
Ports	43
Clearing Disallowed Error for an XGS-PON ONU	43
NNI Networks	44
Add An Existing NNI Network To Inventory	45
Add a new NNI Network to Inventory	46
Remove an NNI Network from Inventory	46
Enable DHCP Relay	46
ONU Inventory	47
Add ONU to Inventory	47
Remove ONU from Inventory	48
Disable Serial Number	48
Enable Serial Number	49
Update ONU IDs, Alloc ID, and LLIDs in Inventory	49
Monitoring	50
Operations	52
Reset the OLT	52
Allow ONU Registration	52
Delete the OLT	53
ONU	54
Summary	54
Identification	56
Configure ONU Name	56
Configure ONU Picture	56

Firmware	57
Upgrade ONU Firmware	57
Disable ONU Firmware Upgrade	58
CPEs	58
Services	59
Config	59
Set the ONU Service Configuration	59
OLT Services	60
Enable OLT Service Ports	61
Set the SLA	61
Configure VLAN Tagging	61
Add a VLAN	61
Remove a VLAN	62
Enable DHCP Relay	62
Service Ports	62
Ports	64
Monitoring	65
Operations	68
Reset the ONU	68
Allow ONU registration	68
Disable ONU Laser	68
Delete the ONU	69
Global Config	69
Alarms	69
View and Edit Alarm Configurations	70
Create an Alarm Configuration	71
Delete an Alarm Configuration	72
SLAs	72
View and Edit SLA Configurations	73
Create an SLA Configuration	73
Delete an existing configuration	74

Services	74
View and Edit Service Configurations	75
Create a Service Configuration	77
Delete an existing configuration	77
Files	77
Uploading	78
Firmware	78
Services	78
Editing and Deleting	78
Pictures	79
Firmware	79
Services	80
Databases	80
Initialize	80
Update	81
Manage	82
Add a New Database	82
Modify Connection for an Existing Database	82
Delete an Existing Database	83
Configurable Fields	83
Devices	84
Pre Provision	84
Search	85
Bulk Updating	85
Accounts	86
Personal	86
Change Password	86
Administration	87
Users	87
Create a New User	88
Modify an Existing User	89

Delete a User	89
Roles	90
Create a New Role	91
Modify an Existing Role's Users	92
Modify an Existing Role's Permissions	93
Delete a Role	93
Sessions	93
Display Preferences	94

Document Purpose

This document serves as the User Guide for the MCMS PON Manager, the WebUI interface component of the MicroClimate Management System. It describes the architecture, security features, and usage information for the PON Manager. This document is intended for users of the PON Manager who are responsible for configuring devices and subscriber services on the PON Network. The document is also intended for system administrators for the purpose of maintenance for the MCMS PON Manager Web Server.

Although the open-source MongoDB is shown as part of the MCMS architecture, MongoDB is not provided as part of the MCMS PON Manager package. MongoDB is a dependency of the PON Manager. Installation, maintenance, and operation of MongoDB is considered out of scope of this document.

(Please see the MCMS Installation Guide for direction on installation and initial configuration of the PON Manager)

Introduction

The MicroClimate™ Management System (MCMS) is the management solution for Juniper PON networks. The MCMS architecture is shown in Figure 1 and consists of the MCMS PON Manager graphical user interface, MCMS Netconf Server, and MCMS PON Controller. Together these components provide a complete network management solution for provisioning and monitoring MicroPlug™ OLT devices, as well as the subtended ONUs compliant with the XGS-PON and 10G-EPON standards.

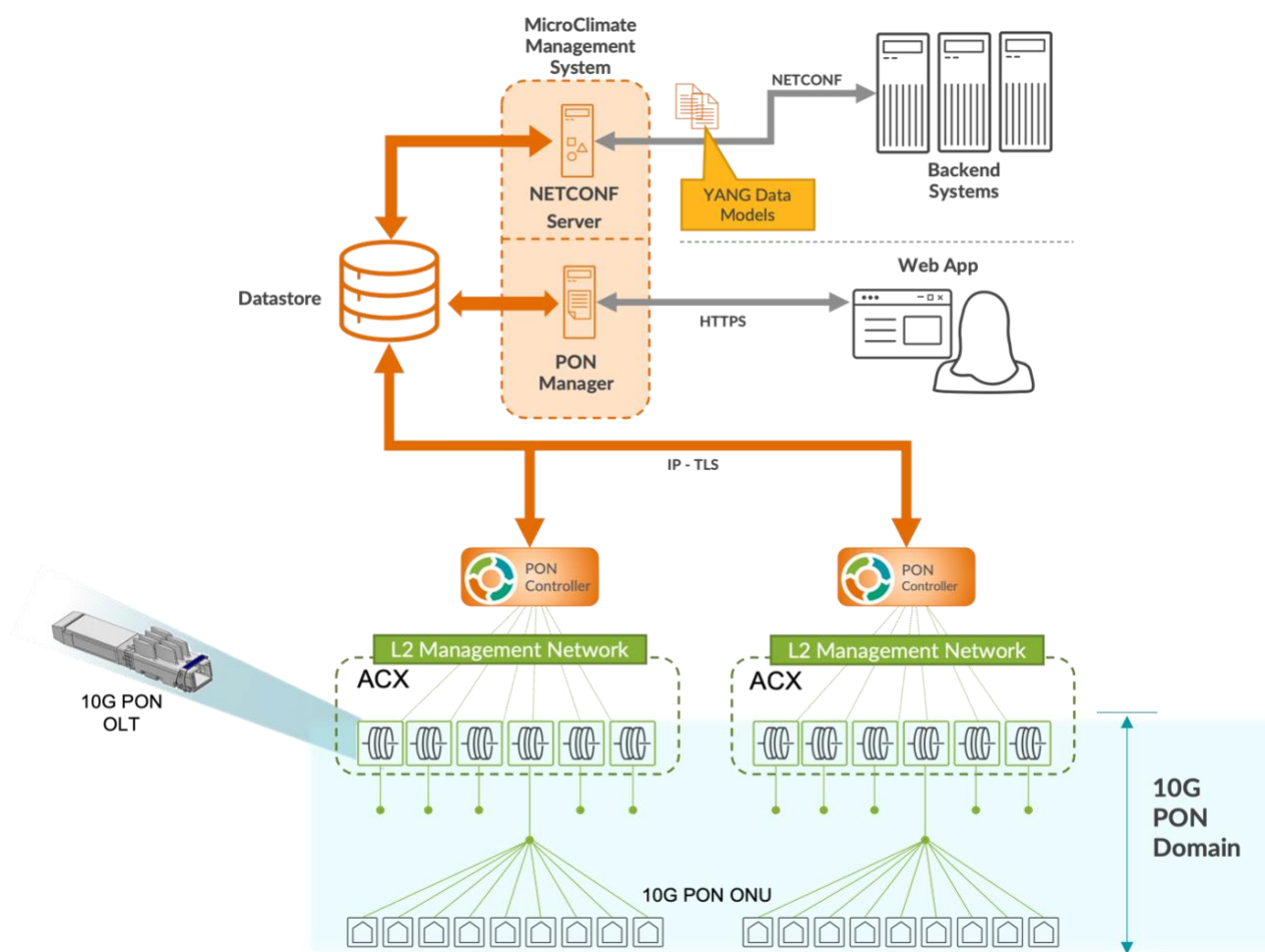


Figure 1 - MicroClimate™ Management System Architecture

MCMS PON Manager

The MCMS PON Manager is a single-page web application (Web App) and an accompanying REST API that provides a graphical user interface for managing the PON Network. The Web App is built on the Angular web application framework, which provides an HTML and JavaScript front-end user interface. The REST API accompanies the Web App for the purposes of providing access to MongoDB for managing MCMS PON Manager users and the PON Network.

The MCMS PON Manager has the following features:

- Alarm management.
- Dashboard view with a summary of PON network conditions.
- Device monitoring and statistics.
- Device provisioning and management.
- Logging for diagnostics and troubleshooting.
- MCMS PON Controller database management.
- MCMS PON Manager user management.
- Polyglot graphical OMCI service configuration tool.
- Service configuration, including VLANs, Service Level Agreements (SLAs), 802.1X Authentication, and DHCP Relay.

Note that the REST API should only be used with the MCMS PON Manager. At this time, the REST API is not a published interface and will change in future releases. Future versions for MCMS PON Manager may make the REST API available directly to customer applications.

MCMS Netconf Server

The MCMS Netconf Server provides a standard Netconf interface and customer facing API for managing the PON network. The Netconf Server is built on the Netopeer2 and Sysrepo open-source architecture and interfaces with MongoDB. The Netconf solution supports standard Broadband forum (BBF) TR-383 and TR-385 YANG models for configuring subscriber services for the PON network. In addition to standard YANG models, MCMS YANG models provide a complete Netconf management solution for PON Controllers, OLTs, and ONU devices. See [MCMS Netconf Server] for more information on the MCMS Netconf solution.

MCMS PON Controller

The MCMS PON Controller is a stateless management controller and device driver application for configuring and monitoring the end points in a MicroPlug™ OLT PON network. It can be hosted directly on a Juniper switch as an embedded component of Junos, or as a stand-alone software process on a VM close the Juniper switch and MicroPlug™ OLT. It runs at customer-configurable intervals. MongoDB serves as the northbound application programming interface for the PON Controller. The PON Controller applies configuration to OLT and ONU devices from documents stored in MongoDB. At each polling cycle, the PON Controller also collects state information, statistics, and logs from devices and reports the information to higher layer applications through MongoDB. The PON Manager and Netconf interfaces manage the PON Controller through MongoDB. The PON Controller's southbound interface is the API which is a Python API used to program OLT and ONU devices using the OLT Management Interface (TOMI) protocol.

MongoDB Datastore

The Mongo database (MongoDB) provides the datastore for the MicroClimate™ Management System. The MongoDB datastore contains all the configuration, state, statistics, alarms, and logging data for the devices in the PON network. Northbound interfaces, such as the MCMS PON Manager, MCMS Netconf Server, and customer applications interface with MongoDB to provision and retrieve monitoring information for devices in the PON network. MongoDB serves as the interface between the PON Manager and Netconf and the PON Controller. See the MCMS Installation Guide for more information on the format and schema that defines the database.

Provisioning data generally flows "downstream" through the management network. The PON Manager and Netconf interfaces write device configuration to MongoDB. The PON Controller reads the configuration data from MongoDB and programs the OLT and ONU devices accordingly.

Monitoring data, including device state, statistics, alarms, and logging, is collected and flows "upstream" through the management network. The PON Controller periodically collects state information from devices in the PON network and writes the monitoring data to MongoDB. The PON Manager reads the monitoring data from MongoDB for display in the Web App.

MCMS PON Manager Web Application

The core of the MCMS PON Manager Web App is built on the Angular 11 framework and Bootstrap web front-end toolkit, along with libraries that support specific elements of the user interface. The Cytoscape library provides network visualization utilities for graphical tools such as the Polyglot OMCI Editor. Device statistics charts and graphs are built using the ngx-charts library. The Font Awesome library provides icons and fonts for the user interface. See Section Web Interface for information on using the Web App.

MCMS PON Manager Web Server

The MCMS PON Manager Web Server is built on the ubiquitous Apache HTTP server, with Django running as a WSGI plugin and exposing a REST API. The REST API is an interface to the MCMS PON Controller database being hosted in MongoDB.

The PON Manager utilizes the user, group, permissions, and session management features of the Django REST framework to provide secure access and authorization for the web interface. See sections Security and Accounts for more information on the PON Manager security and account management features.

By default, Django does not support integration with non-relational databases. The django library is used in parallel with a custom module to communicate with MongoDB. As HTTP requests are received, they are handled by Django accordingly, but are mapped to the custom module for database operations instead of Django's default ORM.

Note that the REST API is intended to be used by the PON Manager only. The REST API is subject to change in future releases, and customer applications should not interface directly with the REST API. Future versions for MCMS PON Manager may make the REST API available directly to customer applications.

MongoDB

The Mongo database provides the datastore for the MicroClimate™ Management System and is used to store PON device provisioning and monitoring information collected by the PON Controller. MongoDB is an open source, secure database (www.mongodb.com) which employs a NoSQL architecture. See the MCMS Installation Guide for information on installation and configuration for use in MCMS management solutions.

In addition to the PON device configuration and monitoring information, MongoDB is also used to store users, permissions, and session information used by the Django REST framework.

Security

Role Based Access Control

The PON Manager utilizes user roles and permissions to control what actions each user may perform. Every user may be assigned a role by a System Administrator. Each role within the system may have a set of permissions defined for what any user within that role may do. Each permission has an access type associated with it based on the Create, Read, Update, Delete (CRUD) model. For example, a user role may be assigned the permission to read an OLT's configuration data but may not be assigned permission to update it.

These permissions are enforced within the PON Manager REST API. For every call the Web Client makes to the server, the attached user session provides the REST API with the information needed to verify that user. After being verified to have an existing and valid session, that user's permissions are then checked for the required permissions for that operation. If the user does not have the required permissions, the server takes no action and informs the Web Client that the user is not permitted to access the requested data. One exception is PON Manager login. A user will not have a valid session prior to login, so no permissions are checked here. See Authentication for more information on session authentication.

The Web Client hides and disables content within the web application based upon the permissions of the current user. A user who only has read permissions, for example, will not have any save, create/add, or delete buttons available to them throughout the application. See Accounts for more information on configuring users, roles, and permissions using the Web Client.

HTTPS

PON Manager supports use of HTTPS for the REST API and Web App via Apache configuration by default. HTTPS ensures the confidentiality, authenticity, and integrity of all PON Manager network traffic. Non-secure HTTP is not supported.

Authentication

The PON Manager utilizes the session authentication mechanism from the Django framework. This mechanism associates a given HTTP request with a user.

Authentication relies on the following session state and data:

- **Session Identifier** is represented as a cookie with the key: ‘__host-sessionid’, which is a token that associates an HTTP request to a user. This token maps directly to the primary key of a Session Object stored in MongoDB.
- **CSRF Token** (Cross Site Request Forgery protection token) is sent to the requester in the form of a set-cookie header. This token is required to be sent on all unsafe HTTP verb (Post, Put, Delete, etc.) requests as a header with the key; ‘X-CSRFToken’
- **Session Object** stores encoded data for the session, including the associated user, as a document in MongoDB in the PON Manager User Database (juniper_users). A unique Session identifier identifies the session object.

The following describes the process of authenticating a user session:

1. Before a successful request can be made, the user must authenticate via email/password and retrieve a valid session token. (POST /user/authenticate/)
2. Upon successful authentication, the requester must send the ‘__host-sessionid’ cookie and X-CSRFToken header (if required, for unsafe HTTP verbs) on every request.
3. If an HTTP request lacks a valid Session Token, a 403 (Forbidden) response will be returned.

Session Expiration

A user session will expire after a period of inactivity. The session expiration timeout is configured in the PON Manager User Database in units of minutes. The default time period is 20 minutes after the last successful HTTP request. If a request is made with an expired Session Token, a response of 403 will be returned. The user will have to re-login and authenticate with PON Manager when their session expires.

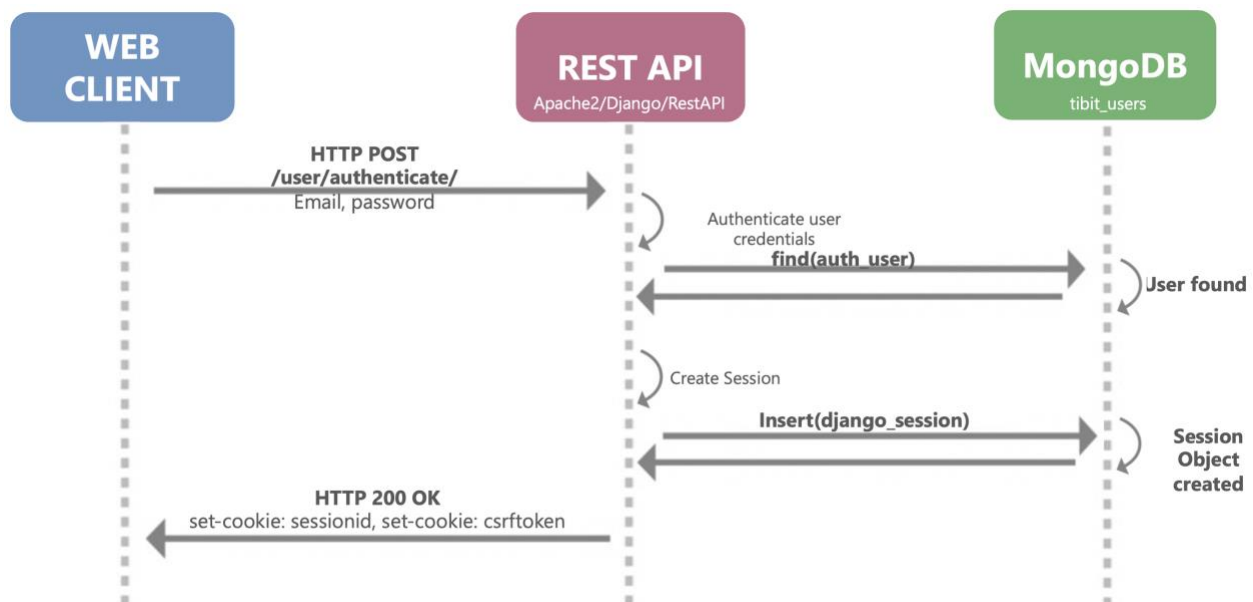
Session Purging

A new Session Object is created and stored in MongoDB upon successful authentication. This is the case even if the user already has a previous Session Object(s) stored. Expired Session Objects are purged from MongoDB every 24 hours.

System Diagrams

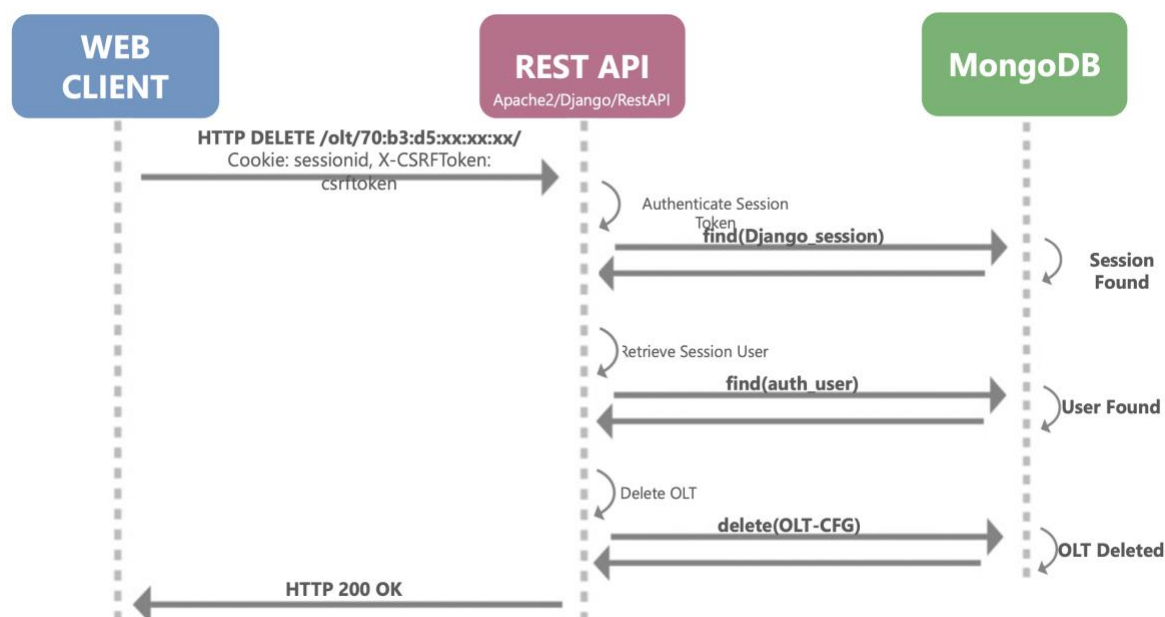
The following diagram displays the sequence of creating a user session.

1. **HTTP POST** - a user makes an HTTP request with a valid email and password combination to the REST API to authenticate.
2. **find(auth_user)** - the REST API queries the user collection juniper_users in MongoDB to find and return the user profile matching the email password combo provided.
3. **Insert(django_session)** - the REST API creates a session associated with the authenticating user and inserts the session object into MongoDB.
4. **HTTP 200 OK** - the user receives a successful response containing two 'set-cookie' headers for the session identifier and csrftoken.



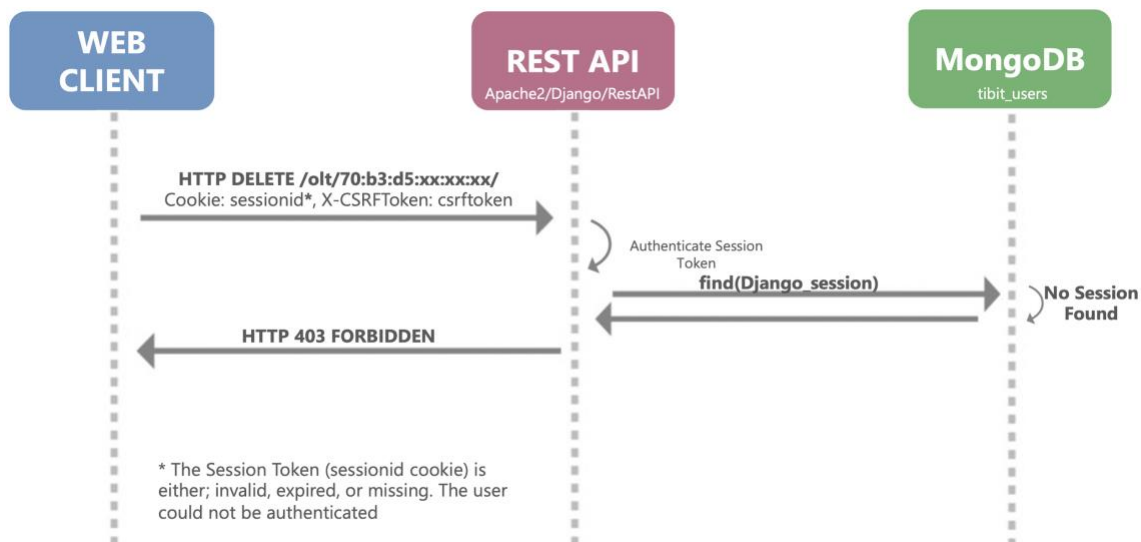
The following diagram displays the sequence of successfully authenticating with a valid user session.

1. **HTTP DELETE** - a user makes an HTTP request containing a valid sessionid and csrftoken cookie
2. **find(Django_session)** - the REST API queries the session collection in MongoDB to find and return the session object with a matching sessionid.
3. **find(auth_user)** - the REST API queries the user collection juniper_users in MongoDB to find and return the user profile associated with the session object.
4. **delete(OLT-CFG)** - the authenticated request is performed
5. **HTTP 200 OK** - a successful response is returned to the user



The following diagram displays the sequence of failed authentication

1. **HTTP DELETE** - a user makes an HTTP request containing an invalid, expired, or missing sessionid cookie.
2. **find(Django_session)** - the REST API queries the session collection in MongoDB to find and return the session object with a matching sessionid. No valid session object is found.
3. **HTTP 403 FORBIDDEN** - an unsuccessful forbidden response is returned to the user.

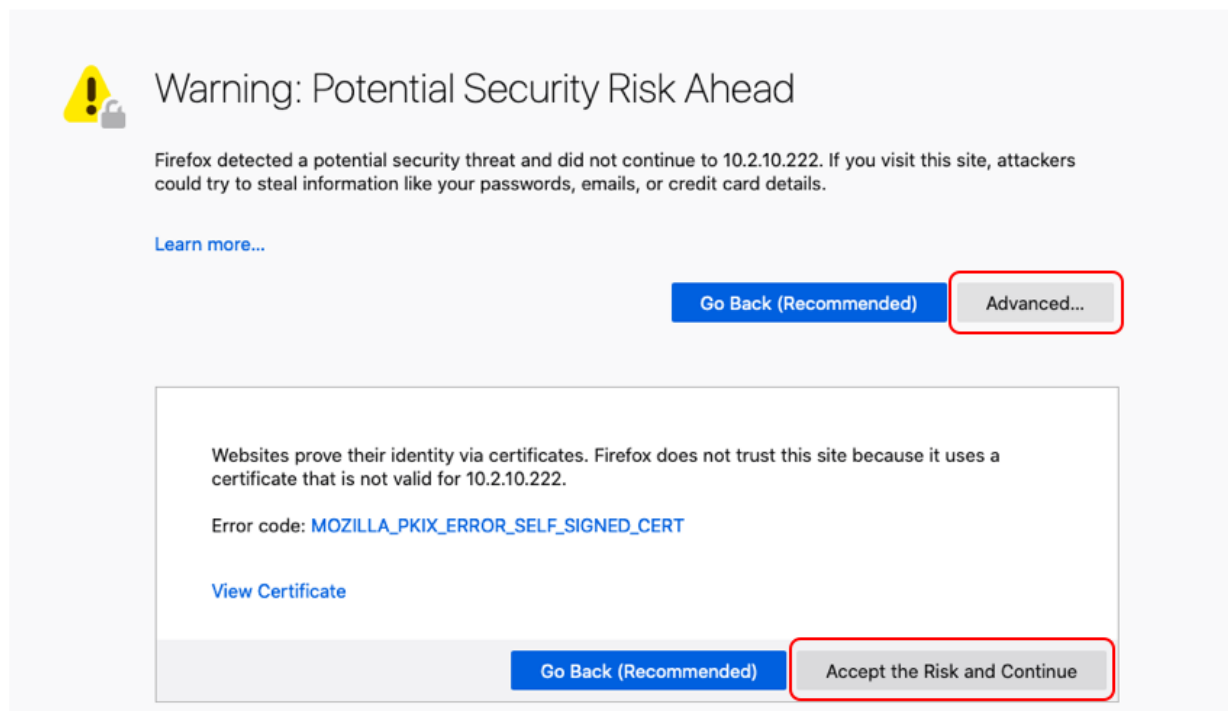


Web Interface

Logging In for the first time

If using a [configured user database](#) that has no users, the user is prompted to create the first [administrative](#) user. Otherwise, the user is directed to enter their credentials to access the Web App.

If using the default self-signed or other untrusted certificate, a security exception must be added in the browser for both the PON Manager Web App and REST API. To do so, connect to the IP address for the Web App. The browser displays a warning similar to the following:



Even with the security exception, HTTPS traffic is still encrypted. Click the button labeled “Advanced” and then click the button labeled “Accept the Risk and Continue”.

Creating and Managing Accounts

When a new MCMS PON Manager system is installed, the first user to access the Web App is prompted to create a user. This user account will be an administrator by default.

Administrators are responsible for creating additional user accounts. This can be done from the Accounts tab.

Creating an account adds the new user to the user's database as configured in the user_database.json configuration file. Passwords are encrypted and are not stored in plain text.

Password Requirements

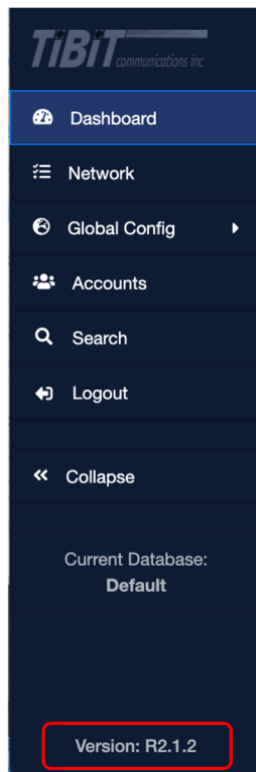
Users are required to choose a password with a minimum length of ten characters when updating their passwords.

Logging Out

The option to logout is accessible from the Site Navigation menu on the left of the PON Manager user interface. When selected, a confirmation dialog appears.

If a user is approaching the maximum allowable time period of inactivity, a warning is displayed to the user notifying them that they will be logged out. If no action is taken, the user will be logged out.

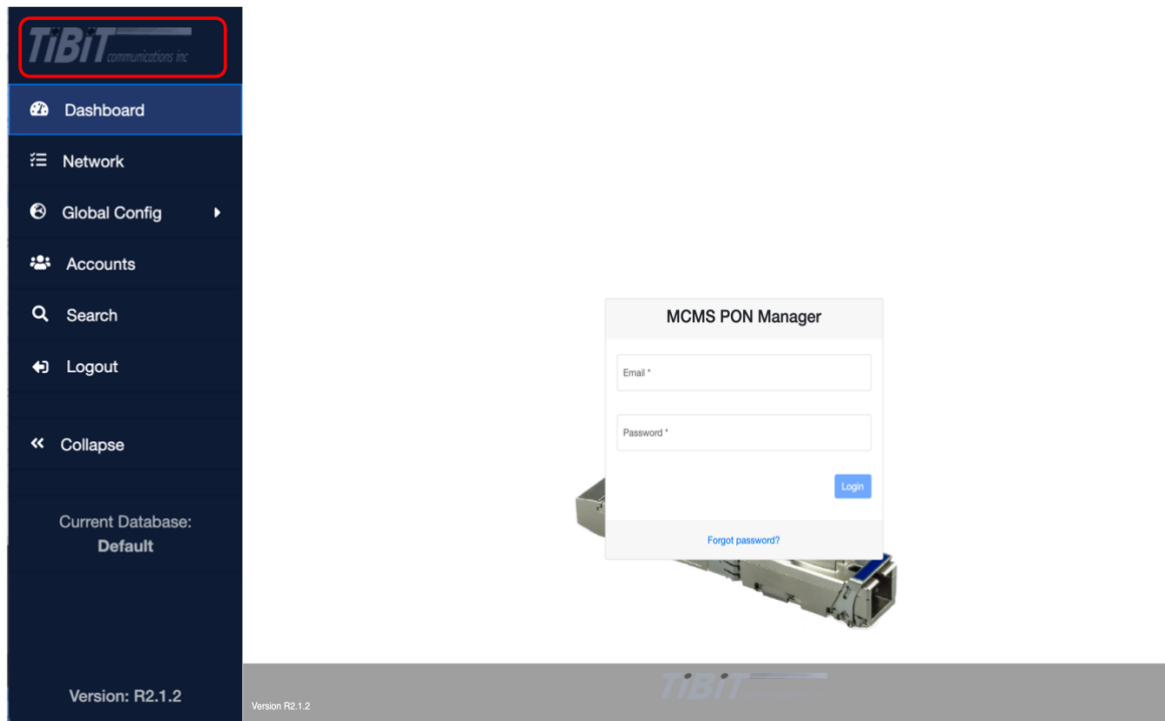
Version



A user can see more about the version of the MCMS PON Manager by clicking on the “Version” label on the bottom of the Site Navigation menu. This button displays a popup that gives details on the current build being used as well as any third-party software used in the creation of the MCMS PON Manager.

Site Customization

The MCMS PON Manager provides the ability to add custom logos and backgrounds in order to make the site look more brand-specific. There are four places that the Web App provides the means to customize the appearance of the interface: the background of the login screen, the footer text and logo of the login screen and the corner logo visible after login.



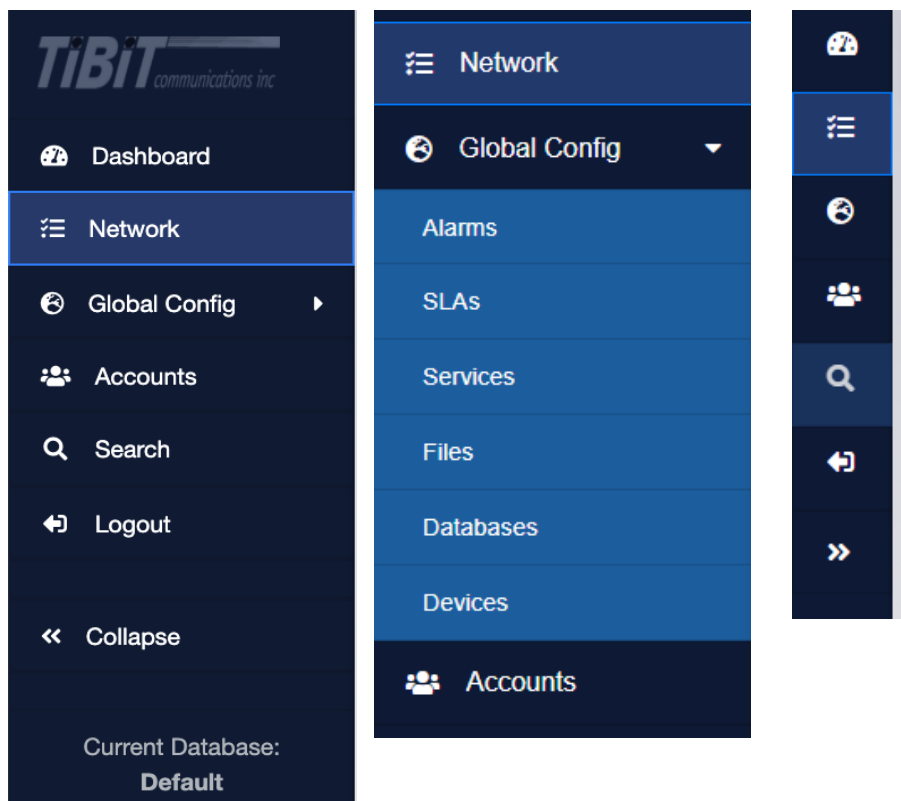
After logging into the Web App, any user can customize the look of the PDM by clicking on the logo on the upper left corner of the screen. After clicking on the logo, a popup appears showing the current images and a preview for the user of what the selected images would look like after saving.

Note: Images uploaded larger than the recommended size will not be displayed.

Site Navigation

After having logged into the PON Manager, site navigation is visible on the left-hand side of the window. The current page that is selected is marked by the highlighted section of this navigation menu. The first view a user sees after logging in is the Dashboard page. From anywhere on the site, it is possible to transition between the Dashboard, Network, Global Config, Search, and Accounts pages as well as logout of the application. The Global Config section expands to its own menu for navigation to the Alarms, SLAs, Services, Files, Databases, and Devices pages. This menu may be collapsed to allow for more horizontal screen space. The ID of the current

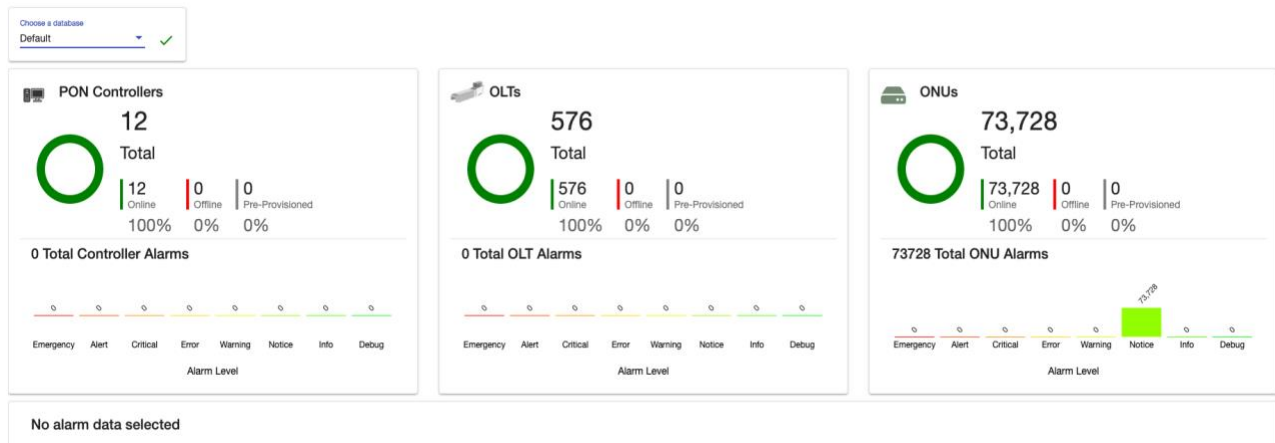
database in use is shown at the bottom of the menu. The following images show the navigation menu with Network selected, the expanded Global Config menu, and the view when collapsed.



Auto Refresh

Most pages of PON Manager will automatically refresh their data. This occurs every 5 seconds on most pages. Some pages that require retrieval of larger amounts of data may use a longer timer such as 10-15 seconds. Those pages that require the most data will not update automatically but will have a refresh button to update the page's data manually. It is not required to refresh the browser to retrieve the updated data for a tab.

Dashboard



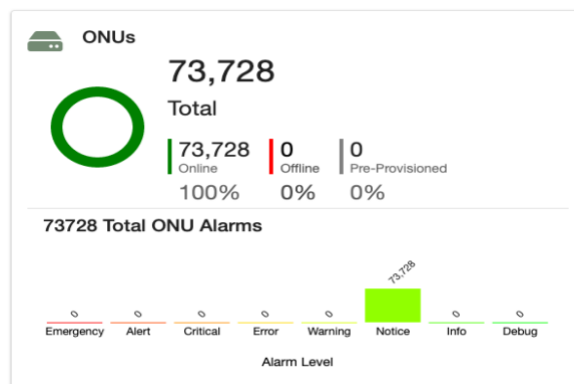
The PON Manager Dashboard view displays an option to select a database for use, as well as counts of PON Controllers, OLTs, and ONUs in the database and the total alarms for each device type.

Database selection determines the source of the configuration, state, statistics, alarms and logs presented in the Dashboard, Network, Global Configuration, and other portions of the user interface for this session.

Devices are categorized into three different states: Online, Offline, and Pre-Provisioned. These counts are reflected in pie charts and percentages. Beneath the device counts are bar charts displaying the total number of alarms of each type for each device type.

Alarms Summary

The alarm counts for a given device type are shown at the bottom of that device type's tile. The bars in these charts are clickable to see more detail for the selected alarm level. For example, after clicking on the "Info" bar, a table of all Information level alarms populates below the device summary tiles.



The Alarms table displays the ID of the device the alarm is for, followed by the time the alarm was reported, a description, and the IDs of the parent OLT and PON Controller (where applicable).





All ONU Notice alarms <small>Filter</small>				
ID	Time	Description	Parent OLT ID	Parent Controller ID
ALPHe3930e76	2/10/2021, 6:16:15 PM	STATS OLT-PON RX Optical Level < -28	70:b3:d5:52:34:9c	08:00:27:09:51:4b
ISK771e81d98	2/10/2021, 6:16:16 PM	STATS OLT-PON RX Optical Level < -28	70:b3:d5:52:31:56	08:00:27:09:51:4b
ISK771e81c38	2/10/2021, 6:16:16 PM	STATS OLT-PON RX Optical Level < -28	70:b3:d5:52:31:56	08:00:27:09:51:4b
a8:9a:93:f6:a:10	2/10/2021, 6:16:15 PM	STATS OLT-PON RX Optical Level < -28	70:b3:d5:52:34:18	08:00:27:09:51:4b
Items per page: 5 1 - 4 of 4 < > >>				

Network

The Network page allows the user to view/edit the states and configurations of the devices (PON Controllers, Switches, OLTs, and ONUs) on the PON. The user is shown the hierarchy of devices they are viewing, and may monitor device states, alarms, logs, and statistics, and configure settings.

Devices

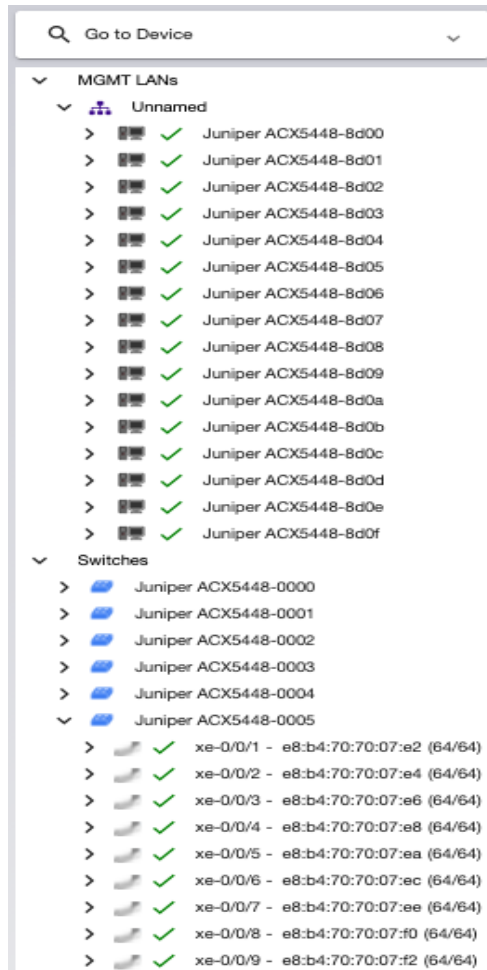
MCMS defines four device types listed in the table below which are top-level management entities within the PON Manager. Each device is represented in the Device Navigation Tree and is identified in the tree by the icon shown in the table below.

Device	Icon	Description
Switch		Network switch with respect to switch properties associated with PON. Switches are discovered by OLT devices through LLDP.
PON Controller		MCMS PON Controller with respect to management of the application service, not the system hosting the Controller.
OLT		MicroPlug OLT device.
ONU		ONUs compliant with the XGS-PON or 10G EPON standards.

Device Navigation Tree

On the left side of the network page there is a navigation tree that displays the manageable devices available from the selected database. The tree has three root-level branches: MGMT LANs, Switches, and Unattached Devices. By default, there is one branch under the MGMT LANs branch, “Unnamed”. This name may change, and others will appear later if Management LAN Names are assigned to PON Controllers. Each named Management LAN branch lists all

the PON Controllers using that name as sub-branches. Under Controllers, OLTs are sorted by OLT MAC address.



All identified switches appear under the Switches branch. This provides a switch-based hierarchy to access the same OLT and subtended ONU devices which can also be found under the MGMT LAN hierarchy described above. Under Switches, OLTs are sorted and organized by the switch port number the OLT is plugged into. The OLT learns the switch port number from the switch using LLDP.

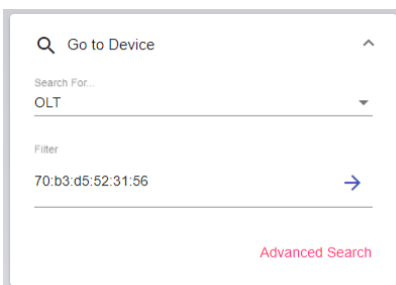
Unattached Devices lists all devices on the network that do not have a parent device. Many factors could determine when a device is listed as unattached. For example, the device's previous parent device may have been removed from the network.

Each device type is marked by their unique icon to help quickly identify the device type. All PON Controller, Switch, OLT, and ONU branches also have a secondary icon indicating device status and alarms. This device tree will automatically update any open nodes. Each of these device branches list the device's ID (Name if available) as clickable text to navigate to that device.

Note: it is not possible to navigate to a Management LAN. Each OLT branch also displays the number of online ONUs out of the total ONUs beneath it, and every ONU also displays its current state.

The width of this tree pane may be adjusted by dragging the right border to the left or right. There is also a help icon at the bottom right that opens a popup to explain the various icons and levels of the tree.

At the top of the navigation tree there is the “Go to Device” section. By expanding this section, the user may select a criteria to search on, enter the search text to find a specific device, and then select the arrow to navigate to that device. Selecting the advanced search button takes the user to the Search page of the application.



Hierarchy View

MGMT LAN		CONTROLLER		SWITCH		OLT		ONU	
NAME: Unnamed		NAME: Juniper ACX5448-8d05		NAME: Juniper ACX5448-0005		NAME:		NAME:	
		MAC: 44:ec:ce:25:8d:05		MAC: 44:ec:ce:25:8d:05		MAC: e8:b4:70:70:07:e8		MAC: TBIT01e80001	
						PORT ID: xe-0/0/4		STATE: Registered	
<	Summary	Identification	Firmware	CPEs	Services	Ports	>		
<div>ONU Summary</div> <div>ID: TBIT01e80001</div>									

Displayed at the top of the Network page, the Hierarchy View bar displays the current hierarchy of devices that are being viewed. Starting on the left with the Management LAN, the selected PON Controller and/or Switch, OLT and ONU are displayed. The Name, ID/MAC Address, Switch Port (for OLTs), and State (for ONUs) of the current hierarchy devices are all displayed here. Each device listed, excluding the MGMT LAN, is clickable to quickly navigate to any device in the hierarchy. Only those devices that have already been selected are shown here. For example, if a user selects a PON Controller to view, and then selects an OLT under that Controller, they will see the following (Note that the ONU portion of the hierarchy is not displayed in this example):

MGMT LAN	CONTROLLER	SWITCH	OLT		
NAME: Unnamed	NAME: Juniper ACX5448-8d05 MAC: 44:ec:ce:25:8d:05	NAME: Juniper ACX5448-0005 MAC: 44:ec:ce:25:8d:05	NAME: MAC: e8:b4:70:70:07:e8 PORT ID: xe-0/0/4		
<	Summary	Identification	Firmware	Ports	Monitoring
<div>OLT Summary</div> <div>MAC: e8:b4:70:70:07:e8</div>					

PON Controller

Summary

The Summary tab displays information relevant to the device's current state and status. Values such as the total alarm count, MAC Address, version, OLT and ONU counts, and status are displayed as well as the time stamp when the PON Controller's state was updated. A table is also shown to display the active alarms in more detail.

Controller Summary
MAC: 44:ec:ce:25:8d:05

Alarms

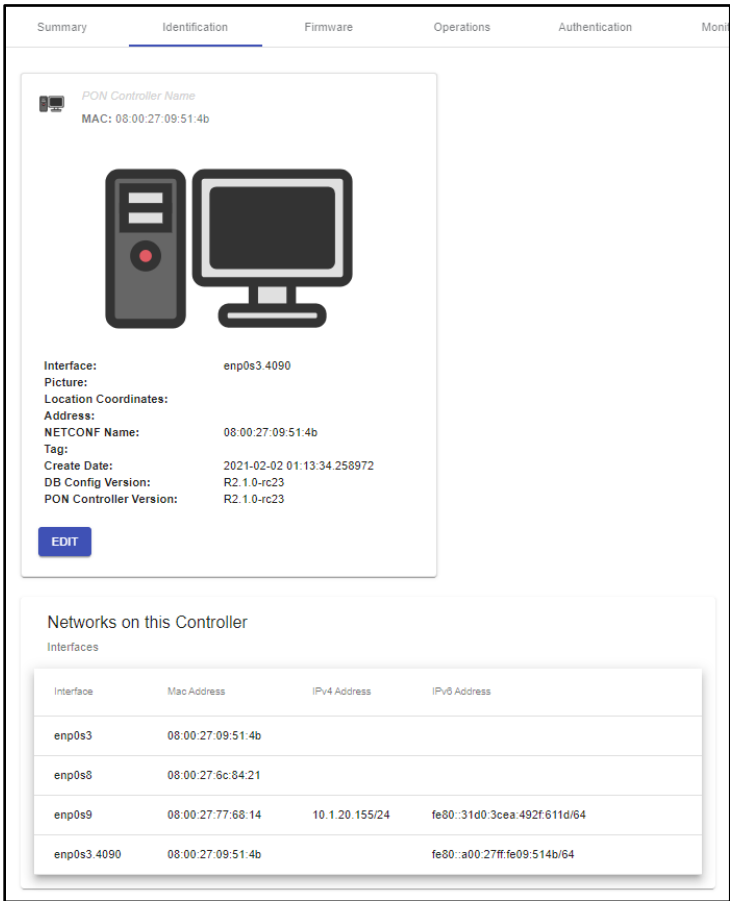
Emergency:	0
Alert:	0
Critical:	0
Error:	0
Warning:	0
Notice:	0
Info:	0
Debug:	0

Summary

Status:	Online
Last Status Update:	9/9/2021, 12:39:17 AM
Configuration Status:	Valid
Version:	R2.0.4
OLT Count (online / total):	48 / 48
ONU Count (online / total):	3072 / 3072

Identification

There are two tiles on the PON Controller Identification page. The first displays identifying information about the Controller such as it's Name, ID, Picture, and more. Several of these items are configurable by clicking on the Edit button at the bottom of the tile. The second tile shows a table of all network interfaces on the PON Controller device.



Configure Controller Name

At the top of the card above the Controller picture there will be an input box which you can type in any name with no restrictions for the new Controller name. Click SAVE to save your changes.

Configure Controller Picture

Where the “Picture” label was before you will see a dropdown list of all of the Controller pictures in your database. Select the one you want to see a preview of. (If you do not see the picture you want, you can add pictures by going to: Global Config, Files, [Pictures](#) tab). Click SAVE to save your changes.

Note: Differences between what is in the state file from what is in the configuration file of devices will be shown in red next to the field of the mismatched value like so:

Bank Pointer: Upgrade Disabled State: 0

Firmware

The PON Controller Firmware tab has two tiles. The first displays the configured maximum allowed parallel ONU firmware upgrades on this Controller. This attribute can be changed by clicking Edit. The second tile lists all ONU firmware upgrades reported by the PON Controller. The table displays the ONU that was/is being upgraded, its parent OLT's ID, the firmware bank, filename, and the last available upgrade status. This status updates automatically and shows the progress of an active upgrade.

The screenshot shows the 'Firmware' tab in the PON Manager interface. It features two main sections: 'ONU Firmware Configuration' and 'ONU Firmware Upgrades'.

ONU Firmware Configuration: This section displays 'Max FW Upgrades: 16' and includes an 'EDIT' button.

ONU Firmware Upgrades: This section contains a table of upgrade history. The table has columns for 'ONU ID', 'OLT ID', 'Bank', 'Filename', and 'Status'. A single entry is shown with a 'Success' status.

ONU ID	OLT ID	Bank	Filename	Status
ISK71e81c38	70:b3:d5:52:31:56	0	FW-GPON-ISK7-G108-7.1.1b18-0.6.bin	Success

Below the table, there is a pagination control showing 'Items per page: 10' and '1 - 1 of 1'.

Authentication

This tab allows for the configuration of RADIUS settings on this PON Controller. The Shared Secret, Revive Interval, and Failure Threshold are configured here along with the primary and two secondary servers and User Access Monitoring settings.

OLT Inventory

Each PON Controller has its own OLT Inventory. When navigating to this tab the user sees all of the OLTs managed by this Controller. OLT IDs, Names, Primary Controllers, and Inventory information are shown. The image below shows a Controller’s OLTs before being inventoried.

FirmwareOperationsAuthenticationMonitoringOLT Inventory

Filter

OLT MAC ↑	OLT Name	Primary Controller	Inventory Config	Inventory State
e8:b4:70:70:07:e2		44:ec:ce:25:8d:05	Primary	Primary
e8:b4:70:70:70:e4		44:ec:ce:25:8d:05	Primary	Primary
e8:b4:70:70:70:e6		44:ec:ce:25:8d:05	Primary	Primary
e8:b4:70:70:70:e8		44:ec:ce:25:8d:05	Primary	Primary
e8:b4:70:70:70:ea		44:ec:ce:25:8d:05	Primary	Primary
e8:b4:70:70:70:ec		44:ec:ce:25:8d:05	Primary	Primary
e8:b4:70:70:70:ee		44:ec:ce:25:8d:05	Primary	Primary
e8:b4:70:70:70:f0		44:ec:ce:25:8d:05	Primary	Primary
e8:b4:70:70:70:f2		44:ec:ce:25:8d:05	Primary	Primary
e8:b4:70:70:70:f4		44:ec:ce:25:8d:05	Primary	Primary

Items per page: 101 – 10 of 48<<>>

EDIT

In the Edit view, a user can set each OLT to be saved in this Controller’s inventory as Primary, Secondary, Excluded, or Not Inventoried. OLTs that do not have a Controller (common case for Pre-Provisioned OLTs) can be added by toggling “Show Unattached” while editing. The example below shows the Edit view of the same Controller after its OLTs were all set to

FirmwareOperationsAuthenticationMonitoringOLT Inventory

Filtere8:b4:70:70:07:e

OLT MAC ↑	OLT Name	Primary Controller	Inventory Config	Inventory State
e8:b4:70:70:70:e2		44:ec:ce:25:8d:05	Primary	Primary
e8:b4:70:70:70:e4		44:ec:ce:25:8d:05	Primary	Primary
e8:b4:70:70:70:e6		44:ec:ce:25:8d:05	Primary	Primary
e8:b4:70:70:70:e8		44:ec:ce:25:8d:05	Primary	Primary
e8:b4:70:70:70:ea		44:ec:ce:25:8d:05	Primary	Primary
e8:b4:70:70:70:ec		44:ec:ce:25:8d:05	Primary	Primary
e8:b4:70:70:70:ee		44:ec:ce:25:8d:05	Primary	Primary

Items per page: 101 – 7 of 7<<>>

SAVE

CANCEL

Show Unattached

Add OLT to Inventory

Select the dropdown in the Inventory Config column of the OLT you wish to configure. Choose if you would like to make this Controller its “Primary” Controller, “Secondary” Controller in case its primary fails, or “Excluded” from being controlled by this Controller. Click SAVE to save the changes. Note that text will appear red for Inventory Config and State while the controller cycles through before recognizing the changes.

Remove OLT from Inventory

Select from the Inventory Config column the dropdown of the OLT you wish to configure. Choose “Not Inventoried” and click SAVE to save your changes.

Monitoring

A PON Controller has four sub-tabs beneath Monitoring. The Config sub-tab contains the configuration for the Controller’s alarm profile, statistics sample time, and all logging. Logging levels may be set for various types of Authentication, Controller, OLT, TAPI, and UMT Relay logs.

The Alarms sub-tab displays a table of active alarms in detail, just like the table at the bottom of the Summary tab.

The Logs sub-tab contains a table of logs the PON Controller has entered the database. The user may select a time range of one Hour, Day, Week, or Month to retrieve all logs from within that range. Logs can then be sorted by time or severity, as well as filtered by time, severity, and message. To delete all logs for this PON Controller, click on the “Clear Logs” button. This prompts the user to confirm the action. After this is performed it cannot be undone.

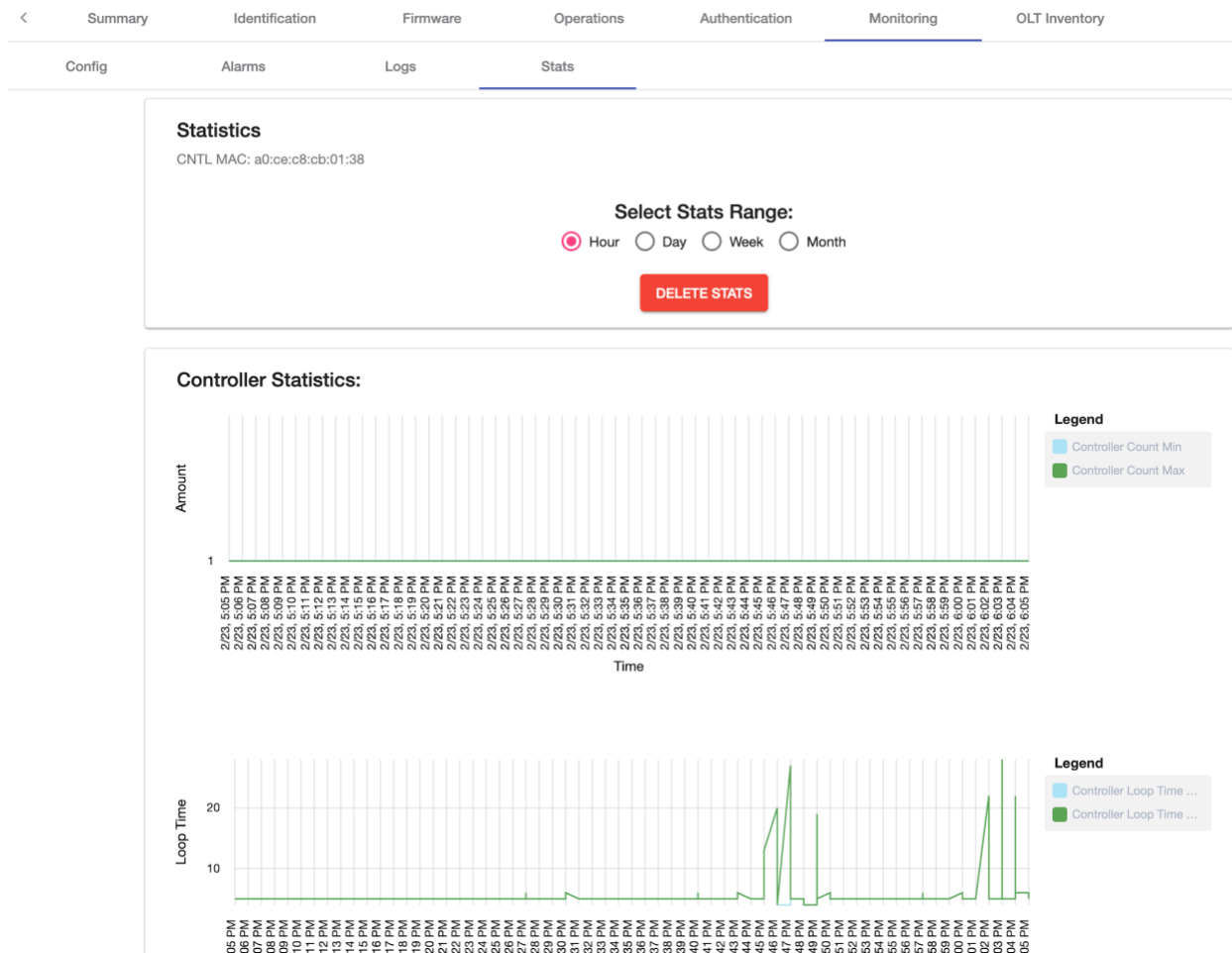
Logs
MAC: a0:ce:c8:cb:01:38

Select date range to view logs:
☒ Hour ☐ Day ☐ Week ☐ Month

Filter


Time	Severity	Message
2/23/2021, 6:04:36 PM	6-INFO	OLT 70:b3:d5:52:36:6c added to CNTL a0:ce:c8:cb:01:38: Unspecified OLT was added
2/23/2021, 6:04:35 PM	6-INFO	OLT 70:b3:d5:52:36:6c has lost lock between loops of a0:ce:c8:cb:01:38 Controller
2/23/2021, 6:03:26 PM	6-INFO	OLT 70:b3:d5:52:36:6c added to CNTL a0:ce:c8:cb:01:38: Unspecified OLT was added
2/23/2021, 6:03:24 PM	6-INFO	OLT 70:b3:d5:52:36:6c has lost lock between loops of a0:ce:c8:cb:01:38 Controller
2/23/2021, 6:02:08 PM	6-INFO	OLT 70:b3:d5:52:36:6c added to CNTL a0:ce:c8:cb:01:38: Unspecified OLT was added
2/23/2021, 6:02:07 PM	6-INFO	OLT 70:b3:d5:52:36:6c has lost lock between loops of a0:ce:c8:cb:01:38 Controller
2/23/2021, 5:48:51 PM	6-INFO	OLT 70:b3:d5:52:36:6c added to CNTL a0:ce:c8:cb:01:38: Unspecified OLT was added
2/23/2021, 5:48:50 PM	6-INFO	OLT 70:b3:d5:52:36:6c has lost lock between loops of a0:ce:c8:cb:01:38 Controller
2/23/2021, 5:47:39 PM	6-INFO	OLT 70:b3:d5:52:36:6c added to CNTL a0:ce:c8:cb:01:38: Unspecified OLT was added
2/23/2021, 5:47:38 PM	6-INFO	OLT 70:b3:d5:52:36:6c has lost lock between loops of a0:ce:c8:cb:01:38 Controller

The final sub-tab under Monitoring for a PON Controller is the Stats tab. This sub tab has a similar time range selection as Logs. All Controller statistics that exist within the selected time range are displayed. In contrast to OLTs and ONUs, all stats graphs for a Controller are displayed by default. It is also possible to delete all statistics for this Controller. Upon clicking “Delete Stats” the user is prompted to confirm. When confirmed, all statistics for this Controller are deleted from the database. This cannot be undone.



Operations

There are several fields describing a PON Controller's behavior. From this tab, the PON Controller can be Paused or Shutdown, and the Management LAN Name, OLT Timeout, and Loop Delay can be configured. All data belonging to this Controller may also be deleted. The delete action prompts for a confirmation and cannot be undone if confirmed.

 **MAC:** 44:ec:ce:25:8d:39

Pause:	false
Shutdown:	false
OLT Timeout:	300
MGMT LAN:	vlan4090
Loop Delay:	3
Loop Count:	352185
Last Loop:	9/8/2021, 4:23:38 AM

EDIT

Delete Controller

Delete this controller and it's records from the database.

DELETE

Pause a Controller

To pause a controller, click EDIT to modify the configuration. Select "True" from the Pause dropdown menu. When the PON Controller is paused, the Controller continues to run, but skips processing configuration changes and gathering monitoring data for OLTs and ONUs. Click SAVE to apply your changes.

Shutdown a Controller

To shutdown a controller, click EDIT to modify the configuration. Select “True” from the Shutdown dropdown menu. When PON Controller Shutdown is set to 'true', the PON Controller application completes outstanding processing for OLTs and ONUs and cleanly exits. Click SAVE to apply your changes.

Delete a Controller

Click DELETE and confirm you wish to delete all configuration records from the database in the popup. After confirming the popup, the Controller's records will be immediately deleted.

Switch

Summary

A Switch's Summary tab shows the Switch's ID, System Name, IPv4 and IPv6 Addresses for quick reference.

MGMT LAN		SWITCH	
NAME:	vlan4090	NAME:	Juniper ACX5448
		MAC:	44:ec:ce:25:8d:3c

Summary	Identification	OLT Inventory	Operations
---------	----------------	---------------	------------

Switch Summary
Chassis ID: 44:ec:ce:25:8d:3c

Summary
System Name:
IPv4 Address:
IPv6 Address:

Identification


Similar to the Identification tab of a Controller, this tab for a Switch allows the viewing and configuration of a Switch's Name, Tag, Location, and more. The configurable fields are listed under the “Configuration” heading, while informational read-only fields are listed under “State”. If a Switch's picture configuration is set to an image in the database, it displays that image in place of the default blue icon.

Summary


Identification

OLT Inventory

Operations

 **Juniper ACX5448**

Chassis ID: 44:ec:ce:25:8d:3c



Configuration

Picture:

Juniper ACX5448

NETCONF Name:

44:ec:ce:25:8d:3c

Tag:

Create Date:

2021-07-14 15:07:18.549000

Location Coordinates:

Address:

State

IPv4 Address:

IPv6 Address:

System Name:

System Description:

EDIT

Configure Switch Name

At the top of the card above the switch picture, there will be an input box where you can type in any name with no restrictions for the new switch name. Click SAVE to save your changes.

Configure Switch Picture

Where the “Picture” label was before, you will see a dropdown list of all the switch pictures in your database. Select the one you want to see a preview of. (If you do not see the picture you want, you can add pictures by going to: Global Config, Files, Pictures tab). Click SAVE to save your changes.

OLT Inventory

Much like the PON Controller’s OLT Inventory, the Switch OLT Inventory lists all the OLTs plugged into the Switch. The main view displays each OLT’s status, MAC Address, and Name, alongside the Switch ID, and each OLT’s Port ID. The image below shows a Switch with three OLTs that are active but not inventoried.

SummaryIdentificationOLT InventoryOperations

OLT Inventory

Filter
xe-0/0/5

Inventoried Status	OLT MAC Address ↑	OLT Name	Switch Chassis ID	Port ID
✓ Online ✓ Inventoried	e8:b4:70:70:06:0a		44:ec:ce:25:8d:05 state: 44:ec:ce:25:8d:00	xe-0/0/5
✓ Online ✓ Inventoried	e8:b4:70:70:06:6a		44:ec:ce:25:8d:05 state: 44:ec:ce:25:8d:01	xe-0/0/5
✓ Online ✓ Inventoried	e8:b4:70:70:06:ca		44:ec:ce:25:8d:05 state: 44:ec:ce:25:8d:02	xe-0/0/5
✓ Online ✓ Inventoried	e8:b4:70:70:07:2a		44:ec:ce:25:8d:05 state: 44:ec:ce:25:8d:03	xe-0/0/5
✓ Online ✓ Inventoried	e8:b4:70:70:07:8a		44:ec:ce:25:8d:05 state: 44:ec:ce:25:8d:04	xe-0/0/5
✓ Online ✓ Inventoried	e8:b4:70:70:07:ea		44:ec:ce:25:8d:05	xe-0/0/5

Items per page: 101 - 6 of 6< < > >

EDIT

The next example shows the edit view of the same Switch's OLT Inventory after one OLT has been added. After adding the OLT to the inventory, it's Port ID becomes editable. One case where a user may want to edit the Port ID is so the PON Manager will show when the actual port the OLT is in does not match the configured/desired port, indicating the OLT was moved. To show and edit Unattached OLTs (OLTs that do not belong to a Switch), toggle the "Show Unattached" option.

SummaryIdentificationOLT InventoryOperations

OLT Inventory

Filter
xe-0/0/5

Inventoried Status	OLT MAC Address ↑	OLT Name	Switch Chassis ID	Port ID
✓ Online ✓ Inventoried - Remove	e8:b4:70:70:06:0a		44:ec:ce:25:8d:05 state: 44:ec:ce:25:8d:00	xe-0/0/5
✓ Online ✓ Inventoried - Remove	e8:b4:70:70:06:6a		44:ec:ce:25:8d:05 state: 44:ec:ce:25:8d:01	xe-0/0/5
✓ Online ✗ Not Inventoried + Add	e8:b4:70:70:06:ca		44:ec:ce:25:8d:05 state: 44:ec:ce:25:8d:02	xe-0/0/5
✓ Online ✓ Inventoried - Remove	e8:b4:70:70:07:2a		44:ec:ce:25:8d:05 state: 44:ec:ce:25:8d:03	xe-0/0/5
✓ Online ✓ Inventoried - Remove	e8:b4:70:70:07:8a		44:ec:ce:25:8d:05 state: 44:ec:ce:25:8d:04	xe-0/0/5
✓ Online ✓ Inventoried - Remove	e8:b4:70:70:07:ea		44:ec:ce:25:8d:05	xe-0/0/5

Items per page: 101 - 6 of 6< < > >

SAVECANCEL☐ Show Unattached

Add OLT to Inventory

Click the Add button on the OLT which you would like inventoried. This will then inventory the OLT in the Switch's configuration and will allow you to edit the Port ID. Click the SAVE button on the bottom of the card in order to save your changes.

Remove OLT from Inventory

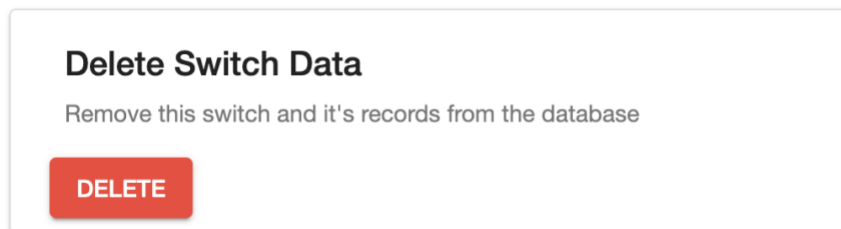
After clicking EDIT, click the Remove button. Click the SAVE button to save your changes. The OLT will maintain it's online or offline status, but the user will no longer be able to make changes to the Port ID.

Operations

The Operations tab contains actions that apply to a Switch.

Delete a Switch

Click DELETE to remove configuration records for this switch from the database and confirm the operation in the popup. There is no need to save changes after you confirm the popup. The Switch's records will be immediately deleted. This action cannot be undone.



OLT

Summary

The OLT Summary tab contains two tiles with information about that OLT. The first tile has the total alarm counts and device status details. The second tile is a detailed list of alarms that are active on this OLT.

OLT Summary

MAC: e8:b4:70:70:06:6a

Alarms

Emergency:	0
Alert:	0
Critical:	0
Error:	0
Warning:	0
Notice:	0
Info:	1
Debug:	0

Summary

Status:	Online
Last Status Update:	9/8/2021, 4:30:16 AM
Online Duration:	22d, 7h, 41m
Since:	8/16/2021, 8:49:15 PM
Uptime:	38d, 5h, 11m, 59s
Configuration Status:	Valid
Version:	R2.2.0
ONU Count (online / total):	3 / 3

☐ *Auto Boot Mode: OFF

*Note: This feature is not supported and should be disabled. Autoboot Mode cannot not be re-enabled after disabling it.

The 'Online Duration' field is displayed for an online OLT and shows the duration of time that this OLT has been online. When the OLT is offline, the summary tab displays both 'Offline Duration' and 'Last Online Duration'. The 'Offline Duration' shows how long the OLT has been offline. 'Last Online Duration' displays the length of time the OLT was previously online before it went offline.

Identification

 OLT Name
MAC: e8:b4:70:70:06:6a



Model:	SFPP-10GE-OLT
Manufacturer:	JUNIPER-2K1
Manufacturer Model:	740-117808
Manufacturer Serial Number:	M1202000468
Vendor:	JUNIPER-2K1
Serial Number:	OLT-E8B4707002B0
Production Code:	
FW Version:	R2.2.0
ASIC:	180713
Picture:	PIC-OLT-Juniper-CTemp
Location Coordinates:	
Address:	
NETCONF Name:	e8:b4:70:70:06:6a
Tag:	
Create Date:	2021-06-28 16:33:22.839944
Parent Controller:	44:ec:ce:25:8d:01
PON Controller Version:	R2.0.4
DB Config Version:	R2.2.0

Switch Description

Chassis ID:	44:ec:ce:25:8d:01
System Name:	Juniper ACX5448-0001
Port ID:	xe-0/0/5
IPv4 Address:	10.1.20.99
IPv6 Address:	
System Description:	Juniper ACX 5448
Port Description:	SFP 10 Gig Ethernet Port

EDIT

The OLT Identification tab contains various fields that help to describe and identify the OLT. The single tile lists details about the OLT hardware, firmware and a few configurable items. There is also a Switch Description at the bottom that provides the OLT's parent Switch information as well.

Several values are configurable from this tab including the OLT's Name, Picture, and Tags.

Configure OLT Name

Click EDIT. At the top of the card above the OLT picture, there will be an input box where you can type in any name with no restrictions for the new OLT name. Click SAVE to save your changes.

Configure OLT Picture

Click EDIT. Where the "Picture" label was before, you will see a dropdown list of all the OLT pictures in your database. Select the one you want to see a preview of. (If you do not see the picture you want, you can add pictures by going to: Global Config, Files, Pictures tab). Click SAVE to save your changes.

Firmware

The Firmware tab contains two sub-tabs that allow for managing the Firmware on a given OLT and monitoring the firmware status on subtended ONUs, respectively; OLT Firmware and ONU Firmware.

OLT Firmware

The OLT Firmware sub-tab shows the configured and active settings for the OLT's firmware. The tile displays the firmware versions in each firmware bank and the current version that is

running. When editing, the firmware banks allow for the selection of any version of OLT firmware found in the database.

OLT Firmware	
Current Version:	R2.1.0
Bank Pointer:	0
Bank 0:	
File:	R2.1.0-OLT-FW.bin
Version:	R2.1.0
Bank 1:	
File:	R2.0.0-OLT-FW.bin
Version:	R2.0.0
Bank 2:	
File:	R1.3.1-OLT-FW.bin
Version:	R1.3.1
Bank 3:	
File:	R1.3.0-OLT-FW.bin
Version:	R1.3.0

Upgrade OLT Firmware

To upgrade the OLT firmware, click EDIT. Set the Bank Pointer by selecting the bank from the dropdown with the desired Firmware Image to be used. Ensure that this dropdown is not set to 'Upgrade Disabled'. For Banks 0-3, use the dropdowns to select the desired firmware image for each bank. Click SAVE.

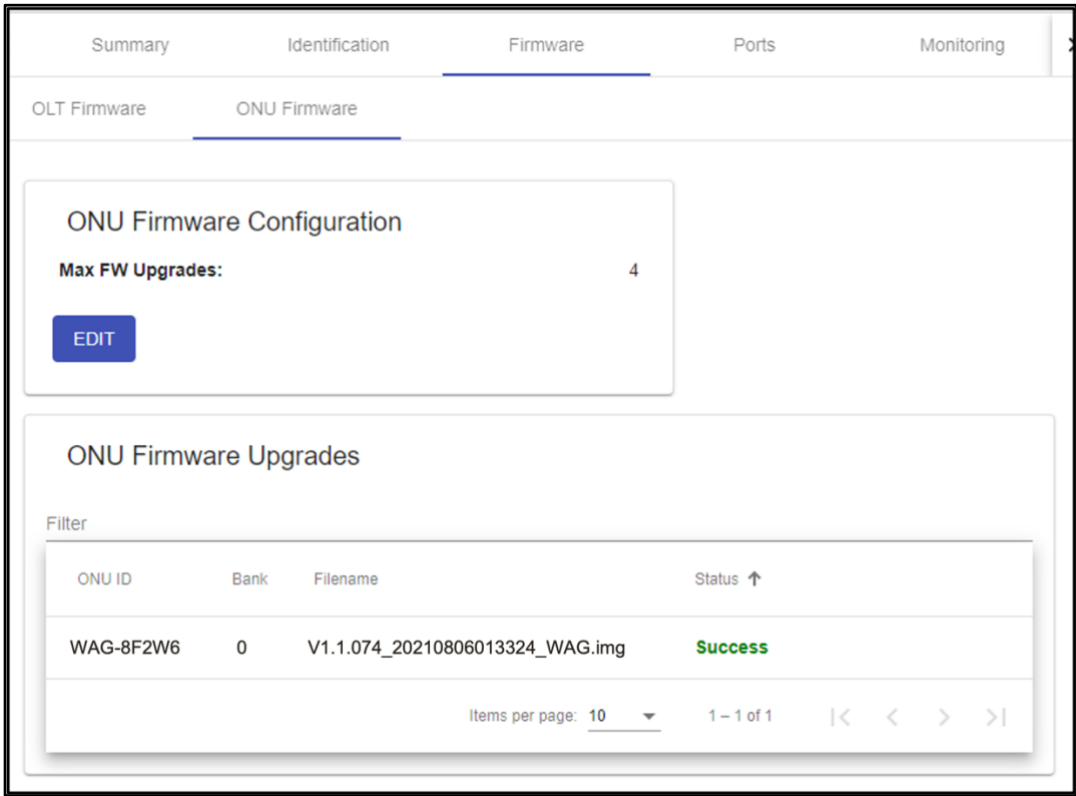
Disable OLT Firmware Upgrade

To disable firmware upgrade for an OLT, click EDIT. Set the Bank Pointer dropdown to 'Upgrade Disabled'. Click SAVE. Note: disabling firmware upgrade does not cancel a download that is already in-progress.

ONU Firmware

The ONU Firmware sub-tab is similar to the PON Controller ONU Firmware tab, displaying the maximum allowed parallel upgrades on this OLT and the firmware upgrade status for all ONUs connected to this OLT. The first tile allows for the viewing and configuration of the maximum parallel ONU upgrades on this OLT. The second tile displays the ONU firmware upgrade status,

which lists the ID of the ONU, the firmware bank the file was saved to, the filename, and the status. The status column displays the last reported status for the firmware upgrade: Success, Downloading with percent complete, or Failed.



Services

The Services tab provides a detailed summary of the services configured on this OLT. This tab displays a list of ONUs attached to this OLT with dropdown panels, which the user can expand to see the detailed service configuration for each ONU.

MGMT LAN	CONTROLLER	SWITCH	OLT
NAME: Unnamed	NAME: 08:00:27:09:51:4b MAC: 08:00:27:09:51:4b	NAME: 8c:3b:ad:68:69:8c MAC: 8c:3b:ad:68:69:8c	NAME: 70:b3:d5:52:31:56 MAC: 70:b3:d5:52:31:56 PORT ID: 1/0/5

<
n
Firmware
Ports
Monitoring
Services
NNI Networks
ONU Inventory
>

Service Configurations for ONUs

Configuration Key:

sVid: 0x88a8
cVid: 0x8100
For VLAN configurations: Enter X for any, 0 for none, or numbers 1-4095.

Switch Port: **1/0/5**

Expand All
Clear All VLANs

ONU: ABCD139b1c1e	Service Config: Disabled	▼
ONU: IJKT71e81c38	Service Config: TBIT-AddCTag	▼
ONU: LMNT71e81d98	Service Config: Disabled	▼
ONU: TBIT4707ff8a	Service Config: Disabled	▼

Operations:

Click EDIT to begin.

1. Set the ONU Service Configuration by choosing a service from the dropdown. Depending on the service, the user may then also edit the "Service Values". The only restriction on these inputs is with the Add CTag configuration which only allows numbers 0 - 4095 inclusively.
2. Set SLA by selecting it from the dropdown. Setting SLA to 'Disabled' disables user traffic on that service.
3. Add an OLT Service to an ONU by clicking the "Add Service" button then fill out the popup form and click SAVE.
4. Remove an OLT Service from an ONU by clicking the vertical menu button.
5. Add a VLAN by clicking the vertical menu button. Users may enter 'X' for any, 0 for none or the numbers 1 - 4095.
6. Remove VLAN by clicking the vertical menu button.

ONU: JKT71e81c38

Service Config: TBIT-AddCTag

Service Configuration

TBIT-AddCTag

1

Service Values:

[ONU-CFG][ONU][CVID]: 22

4

:

OLT-Service 0

Name:

SLA:

SLA
Max

2

SWI

OLT

ONU

NNI VLANs

PON VLANs

s700.c75.cX

s0.c75.cX

5

6

+ Add Service

3

SAVE

CANCEL

A maximum of eight OLT Services (0..7) can be configured per ONU and up to 16 VLANs can be configured per service. Deleting an OLT Service or VLAN configuration can also be performed on this tab.

Ports

The screenshot shows the PON Manager interface with the 'Ports' tab selected. Under 'Ports', the 'PON' sub-tab is active. The interface displays the MAC address '70:b3:d5:52:39:56' and a list of configuration parameters for the PON port. The parameters are as follows:

PON Mode:	GPON
PON Enable:	true
Reg Allow ONU:	ALL
Guard Time [12.8ns]:	64
Discovery Period [ms]:	3000
Encryption:	Bidirectional
Error Det Max Ratio:	20%
Error Det Min Sample [bursts]:	100
PON ID:	0
Preamble Length:	64
Max Frame Size [bytes]:	9600
Downstream FEC:	true
Upstream FEC:	true
Laser Shutdown:	Laser ON
Loss of Signal:	false

Below the configuration list is an 'EDIT' button. To the right of the 'PON ID' field, the text 'State: 3578933590' is displayed in red.

The OLT Ports tab has two sub-tabs. The PON sub-tab has a single tile with the OLT PON port configuration. Note that fields listed on this sub-tab depend on the PON Mode setting. If the PON Mode is set to 'GPON', this tab lists XGS-PON configuration settings and state information. If the PON Mode is set to 'EPON', this tab shows configuration and state specific to 10G EPON. (The PON mode is set to 'GPON' in the example below). The MAC Address shown at the top of this tile is the PON Port MAC Address, not the ID of the OLT.

Clearing Disallowed Error for an XGS-PON ONU

If an ONU has a status of "Disallowed Error", it may be cleared from this tab. To clear this state, select the Edit button in the view above. Locate the "Reg Allow ONU" field drop-down. To clear the error for a specific ONU, select the ID of the ONU to be cleared. To clear the error for all ONUs in this state, select "ALL" from the drop-down. To apply this change, click Save. Clearing the Disallowed Error condition allows the ONU to attempt to register again. Only ONUs using XGS-PON mode will have this option.

The NNI sub-tab contains the OLT's Management VLAN, Management TPID, and configuration for the NNI Max Frame Size. The MAC Address shown at the top of this tile is the NNI Port MAC Address, which is equivalent to the ID of the OLT.

[<](#) [Summary](#) [Identification](#) [Firmware](#) [Services](#) [Ports](#)

PON [NNI](#)

NNI

MAC: e8:b4:70:70:0f:02

Management VLAN:	4090
Management TPID:	34984
Max Frame Size [bytes]:	9600
LLDP Transmit:	false
LLDP Recieve:	true

EDIT

NNI Networks

The NNI Networks tab is used to configure and manage NNI VLANs, bridging, and networking for the OLT device, including MAC leaning controls and NNI Network inventory. The MAC learning controls configure the aging time for CPE MAC addresses and allow a CPE to move between ONUs.

MAC Learning

Age Limit [Seconds]:	3600
Allow CPEs To Move:	false

EDIT

The NNI Network inventory is used to configure L2SD VLANs and Networks for Layer2 Switch Domains (L2SD) on an OLT device. NNI network inventory configuration includes the VLAN

stack, DHCP Relay Protocol Filters, Learning Limit, along with the PON Flood ID and the associated Downstream Flooding SLA. Existing NNI networks may be added to the OLT's inventory and new networks may be created as well.

Note: PON Manager supports Protocol Filter configuration for DHCP only. PON Manager does not support configuring EAPOL for NNI Networks.

NNI Networks

Filter

State	Network VLAN	Learning Limit	Learning Table	PON Flood ID	Downstream Flooding SLA	Enable Filters
<div> <div>✓ Active</div> <div>✓ Inventoried</div> <div>Remove</div> </div>	s0.c100.c0	2046 0 - 2046 [Addresses]		1155 1154-1535, 1919-2044 State: 1155	None None	umt DHCPv6: umt pass DHCPv4: pass pass EAPOL: pass
<div> <div>✓ Active</div> <div>✓ Inventoried</div> <div>Remove</div> </div>	s0.c1000.c0	2046 0 - 2046 [Addresses]		1155 1154-1535, 1919-2044 State: 1155	None None	umt DHCPv6: umt pass DHCPv4: pass pass EAPOL: pass
<div> <div>✓ Active</div> <div>✓ Inventoried</div> <div>Remove</div> </div>	s0.c1001.c0	2046 0 - 2046 [Addresses]		2044 1154-1535, 1919-2044 State: 2044	None None	umt DHCPv6: umt pass DHCPv4: pass pass EAPOL: pass
<div> <div>✗ Not Active</div> <div>✓ Inventoried</div> <div>Remove</div> </div>	s2.c1001.c5	2046 0 - 2046 [Addresses]		 1154-1535, 1919-2044 State:	None None	umt DHCPv6: umt pass DHCPv4: pass pass EAPOL: pass

Items per page: 10 1 - 4 of 4

Add New
Inventory All Networks

SAVE
CANCEL

Click the Learning Table column to view the list of CPE devices learned on a network. The following fields are displayed in the learning table: ONUs, OLT Service Ports, CPE MAC Addresses and Unicast IDs.

Add An Existing NNI Network To Inventory

To add an existing NNI Network to inventory, first click the 'Edit' button on the desired OLT NNI Network table. Following this, select the 'Add' button in the 'State' column of the NNI Network to be added. An NNI Network that exists and can be added to inventory has the state; Active and Not Inventoried.

Add a new NNI Network to Inventory

To add a new NNI Network to inventory, first click the 'Edit' button on the desired OLT NNI Network table. Following this, select the 'Add New' button on the bottom of the panel. This inserts a new row to be configured. The new NNI Network can be found as the last entry in the table. The Network VLAN needs to be configured before the table can be saved. The PON Flood ID, Learning Limit, Downstream Flooding SLA, and DHCP relay can be configured as well.

Remove an NNI Network from Inventory

To remove an NNI Network from inventory, first click the 'Edit' button on the desired OLT NNI Network table. Following this, select the 'Remove' button in the 'State' column of the NNI Network to be removed. An NNI Network that exists and can be removed from inventory has the state; Inventoried.

Enable DHCP Relay

Note: DHCP Relay requires the DHCP Host Processing function to be enabled in the PON Controller.

To enable UMT encapsulation of the DHCP Relay on an NNI network, first click the 'Edit' button on the desired OLT NNI Network table. Set DHCPv4 and/or DHCPv6 in the Enable Filters column to 'umt', which programs the OLT to forward DHCP messages over a UMT tunnel to the DHCP Relay Agent Host Processing function in the PON Controller. When enabled, the DHCP Relay Agent inserts Option 82 in DHCP messages received from the client. Set the DHCPv4(v6) dropdown to 'pass' to disable this feature.

DHCP Relay must also be configured for the ONU Service associated with this NNI Network. See Enable DHCP Relay in ONU Service for more information.

ONU Inventory

The ONU Inventory tab allows for the viewing and configuration of this OLT's inventory of ONUs. The inventory allows the OLT to quickly re-add and reconfigure attached ONUs upon restart. The table shown on this tab displays the ONU IDs, Serial Number/MAC Address, Name, State, ONU Inventory ID, and ALLOC IDs/LLIDs. An ONU that has more information than what can be displayed has a chevron in the far right Expand column. Clicking on the row acts like an accordion. When expanded, the configured ALLOC IDs/LLIDs for the OLT Services are shown. The first image below shows this table with the second row expanded in view mode.

Note: It is strongly recommended that all ONUs be inventoried on the OLT to which they are connected. This is required to enable fast restart and avoid transmit collisions from faulty ONUs that continue to use stale configuration after system reboots.

Inventoried	Serial Number ↑	ONU Name	ONU State	ONU ID (OMCC ALLOC ID)	ALLOC IDs	Expand
✓ Active ✓ Inventoried	TBIT036a0001	-	Registered	1	1154	⌵
✓ Active ✓ Inventoried	TBIT036a0002	-	Registered	2	1155	⌵
✓ Active ✗ Not Inventoried	TBIT036a0003	-	Registered	- State: 3	-	⌵
✓ Active ✗ Not Inventoried	TBIT036a0004	-	Registered	- State: 4	-	⌵
✓ Active ✓ Inventoried	TBIT036a0005	-	Registered	5	1158	⌵
✓ Active ✓ Inventoried	TBIT036a0006	-	Registered	6	1159	⌵
✓ Active ✓ Inventoried	TBIT036a0007	-	Registered	7	1160	⌵
✓ Active ✓ Inventoried	TBIT036a0008	-	Registered	8	1161	⌵
✓ Active ✓ Inventoried	TBIT036a0009	-	Registered	9	1162	⌵
✓ Active ✓ Inventoried	TBIT036a000a	-	Registered	10	1163	⌵

Items per page: 10 1 - 10 of 64 |< < > >|

EDIT

Add ONU to Inventory

Click EDIT to modify the OLT's inventory. If an ONU is not inventoried, the row displays an Add button. This sets the ONU to be saved in the OLT's inventory and allows for the inventory values to be edited. The ALLOC ID/LLID inputs provide the acceptable ranges and display warnings for disallowed values as they are filled in. The ONU ID is also settable from here. All

ONU IDs must be unique per OLT, as well as all ALLOC IDs/LLIDs. Once the desired ONUs are added and their values updated, click SAVE.

Monitoring Services NNI Networks **ONU Inventory** Operations

ONU Inventory

Filter

Inventoried	Serial Number ↑	ONU Name	ONU State	ONU ID (OMCC ALLOC ID)	ALLOC IDs	Expand
✓ Active ✗ Not Inventoried + Add	ARCN139b1c1e	-	Unspecified	-	-	▼
✓ Active ✓ Inventoried - Remove	ISKT71e81c38	-	Unspecified	3 1 - 128	-	▲
<p>ALLOC IDs</p> <p>OLT Service 0: 1154</p> <p>OLT Service 1: </p> <p>OLT Service 2: </p> <p>OLT Service 3: </p> <p>OLT Service 4: </p> <p>OLT Service 5: </p> <p>OLT Service 6: </p> <p>OLT Service 7: </p> <p>1154 - 1535 (excluding 1278)</p>						
✓ Active ✗ Not Inventoried + Add	ISKT71e81d98	-	Unspecified	-	-	▼
✓ Active ✗ Not Inventoried + Add	TBIT4707#8a	-	Unspecified	-	-	▼

Operations

☐ Disable Serial Number

Enable Serial Number

Items per page: 10 1 - 4 of 4 << < > >>

SAVE **CANCEL** ☐ Show Unattached

Remove ONU from Inventory

Click EDIT to modify the inventory. If the Remove button is selected, this sets the ONU to be removed from the OLT's inventory. This action does not remove the ONU from the OLT, only the inventory configuration data.

Disable Serial Number

When the ONU is added to the inventory, several operations are available to the user. There are actions to use the Disable and Enable Serial Number features of the OLT Inventory. The Disable toggle action disables the ONU's transmit laser so it can no longer send messages to the OLT. Upon selecting the toggle, the action is processed.

The screenshot displays the MicroClimate PON Manager interface for configuring an ONU. At the top, the ONU is identified as 'TBIT036a0002' with a status of 'Registered' and an 'ONU ID' of '2'. A 'Remove' button is present. Below this, the 'ALLOC IDs' section shows a grid of OLT-Service boxes (0-7). OLT-Service 0 contains '1155', and OLT-Service 1 contains '1200' and is highlighted with a blue border. A red text label '(Inventoried, Not Active)' is positioned between OLT-Service 1 and OLT-Service 3. The 'Operations' section on the right includes a 'Disable Serial Number' toggle (currently off), an 'Enable Serial Number' button, and a red 'SYNC' button. A range '1 - 128' is shown below the ONU ID. At the bottom left, the range '1154 - 1535 (excluding 1278)' is noted.

Enable Serial Number

The Enable Serial Number button is an action that re-enables the ONU's transmit laser so it can once again send messages to the OLT.

Update ONU IDs, Alloc ID, and LLIDs in Inventory

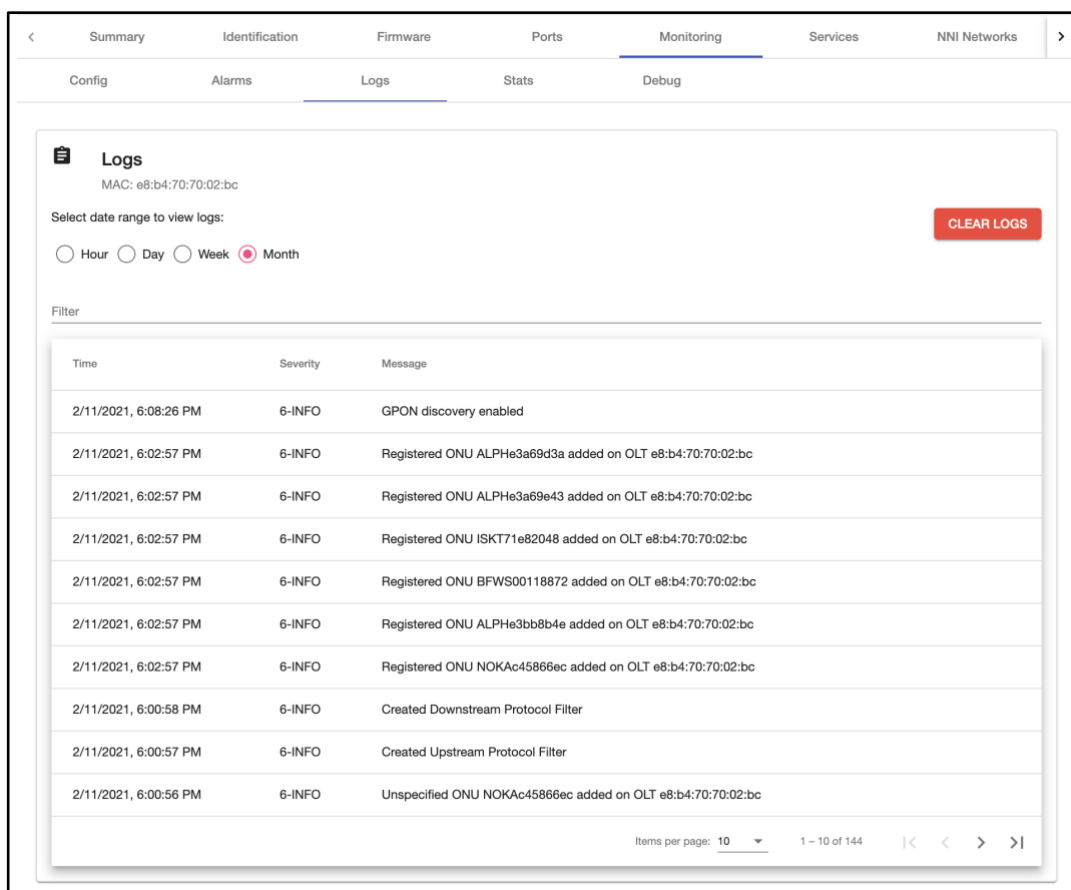
A SYNC button appears if the configured settings do not match what is active in the OLT's state. Clicking SYNC immediately sets and saves the configuration values for that ONU to match the state values. The view will remain in edit mode. This action is only available when the configuration does not match what is active.

Monitoring

OLT Monitoring contains five sub-tabs: Config, Alarms, Logs, Stats, and Debug. The Config tab allows the user to view and edit the OLT's alarm profile and to enable real-time stats.

The Alarms sub-tab displays the same table seen on the Summary tab to see the active alarms in detail.

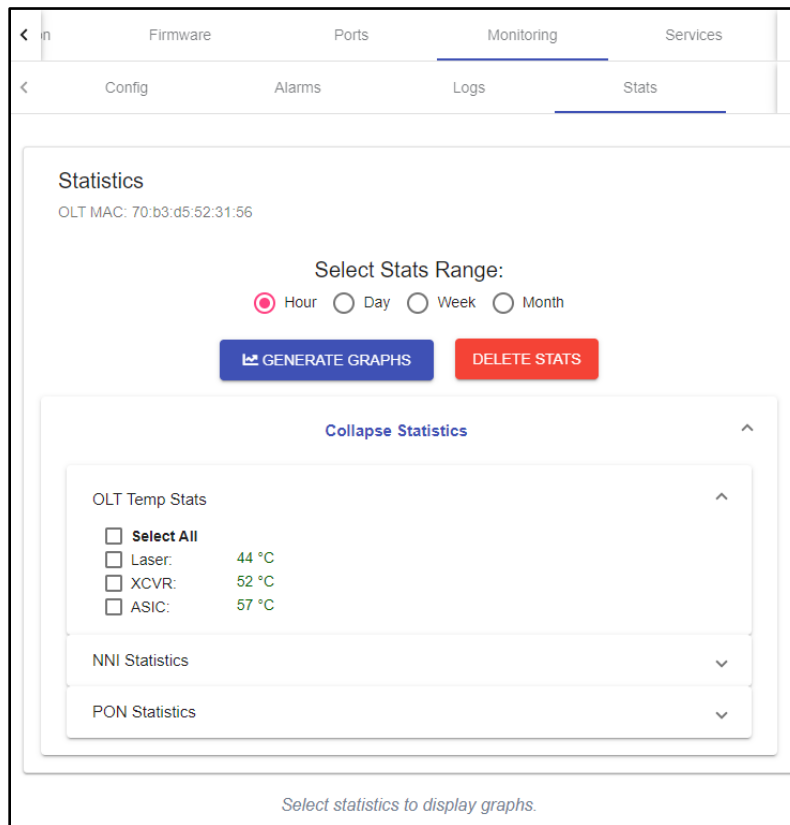
The Logs sub-tab lists all log messages for this OLT that exist within the selected time range of one Hour, Day, Week, or Month. There is also an option to clear all existing logs for this OLT. Upon clicking this, the user is prompted to confirm the deletion. If confirmed, all logs for this OLT are removed from the database. This cannot be undone.



The Stats sub-tab for an OLT has the ability to graph the selected statistics for this OLT over the selected time range. The user may choose to see stats from the last Hour, Day, Week, or Month. Click on “Show Statistics” to open the accordion to view selectable statistics available for graphing. OLT statistics are split into three groups: Temperature, PON, and NNI, where each group lists all statistics that may be graphed within its group. The most recent statistic value is shown next to the name. Check the boxes for the statistics desired to be graphed and click

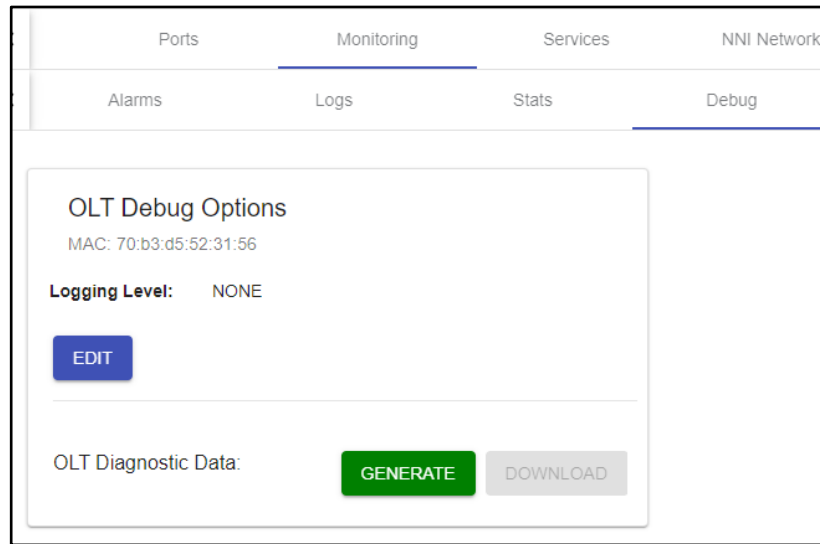
“Generate Graphs”. A loading icon is shown for a brief period, and then graphs for each statistic with the selected time range are displayed on the interface.

The user may also delete all statistics for this OLT. If “Delete Stats” is clicked, the user is prompted to confirm. After confirmation, all statistics for this OLT are deleted. This cannot be undone.



The Debug sub-tab contains a single tile that allows the user to configure OLT Debug Logging Level, as well as generate and download a JSON formatted dump of the OLT debug information.

Generating and downloading OLT Diagnostic data is a multi-stage process. First, click ‘GENERATE NEW’ to trigger the PON Controller to collect diagnostic information from the OLT device. The ‘DOWNLOAD’ button remains disabled until the data collection is complete. Once the PON Controller completes the data collection, PON Manager detects that the process is complete and the ‘DOWNLOAD’ button is enabled, allowing the user to download the diagnostic data to the local PC.



Operations

There are four operations that may be performed on an OLT from this tab.

Reset the OLT

When clicked, the user is prompted to confirm the action. Once confirmed, the OLT is sent a signal to restart. This process may take a few minutes.

Allow ONU Registration

When an OLT detects a faulty ONU on the PON (e.g., ONU transmitting over other ONUs), the OLT restricts the ONU's access to the PON and transitions the ONU to the Disallowed Error state. The Allow ONU Registration operation clears the Disallowed Error State condition for a specific ONU or all ONUs in the Disallowed Error State.

To clear the Disallowed Error for an ONU, select the desired ONU or ALL from the dropdown field 'Reg Allow ONU'. Next, click the 'ALLOW ONUs' button to trigger the OLT to allow the ONU(s) to register.

If the OLT is busy in the process of allowing an ONU(s) to register, the message 'Allow ONU Registration operation is in progress . . .' is displayed and the 'ALLOW ONUs' button is disabled. Wait for the OLT to complete the pending Allow ONU Registration operation before attempting another Allow ONU operation.

Delete the OLT

The Delete action removes all configuration, state, statistics, and logging data for this OLT from the database. (However, Delete does not remove the OLT from any PON Controller or Switch OLT Inventories). After the delete is confirmed, it cannot be undone.

<

Ports

NNI Networks

ONU Inventory

Monitoring

Operations

Automatic

>

Reset OLT

Restart this OLT

RESET

Delete OLT Data

Remove this OLT and it's records from the database

DELETE

Allow ONU Registration

Clear an ONU(s) from the Disallowed Error state

Reg Allow ONU *

ALL

ALLOW ONUs

ONU

Summary

The ONU Summary tab contains two tiles with data about the ONU. The first tile contains sections showing the total alarm counts for this ONU, status information, downstream and upstream statistics between the OLT and ONU, and the ONU's PON and UNI Ports statuses, including data rates. See OLT Summary for a description of the 'Online Duration' and its related fields. Next to the optical power measurement there is a status icon that indicates the health of the connection. This indicator can either be green, yellow, or red. The first table below describes the conditions for the optical power measurements to be green, yellow, or red. The next table describes the UNI Port status conditions for each color. Finally, there is a table on the page listing all active alarms on the ONU in detail.

ONU Summary Connection Status Health LED criteria

Field	Green	Yellow	Red
OLT TX Power	≥ 3 dB	N/A	< 3 dB
ONU RX Power	≥ -30 dB	N/A	< -30 dB
ONU Bit Error Rate (BER)	Pre-FEC BER = 0 Post-FEC BER = 0	Pre-FEC BER > 0 Post-FEC BER = 0	Post-FEC BER > 0
OLT RX Power	≥ -30 dB	N/A	< -30 dB
ONU TX Power	≥ 3 dB	N/A	< 3 dB
OLT Bit Error Rate (BER)	Pre-FEC BER = 0 Post-FEC BER = 0	Pre-FEC BER > 0 Post-FEC BER = 0	Post-FEC BER > 0

ONU Summary UNI Ports Health LED criteria

Field	Green	Grey	Red
UNI Port 1-5	Enabled, Link	Disabled	Enabled, No Link

ONU Summary

ID: BFWS08140814

Alarms

Emergency:	0
Alert:	0
Critical:	0
Error:	0
Warning:	0
Notice:	0
Info:	0
Debug:	0

ONU Status

Status:	Registered
Last Status Update:	9/7/2021, 9:58:35 PM
Online Duration:	14d, 13h, 17m
Since:	8/24/2021, 8:40:55 AM
Configuration Status:	Valid
Firmware Version:	V1.0.21
Controller Version:	R2.2.0

Downstream Connection

● OLT TX Power (dB):	4.6
● ONU RX Power (dB):	-14.934
● ONU Pre-FEC Bit Error Rate:	0
● ONU Post-FEC Bit Error Rate:	0

Upstream Connection

● OLT RX Power (dB):	-14.5
● ONU TX Power (dB):	5.068
● OLT Pre-FEC Bit Error Rate:	0
● OLT Post-FEC Bit Error Rate:	0

PON Service Ports

● Enabled	Service 0	▲ 0.00 bps	▼ 0.00 bps
-----------	-----------	------------	------------

UNI Ports

● No link	UNI-ETH 1
● No link	UNI-ETH 2
● No link	UNI-ETH 3
● No link	UNI-ETH 4

Distance and Ranging

Equalization Delay [us]:	211.968
One Way Delay [us]:	1.019
Fiber Distance [km]:	0.208

Identification



The Identification tab hosts the configurations for the ONU's Name, Picture, Location, Address, NETCONF Name, Tag, Create Date, and Allowed OLTs. Beneath the configurable items, there is a section of state details. Included here is data about the ONU's Model, Vendor, Firmware, and more. If the ONU has its picture configured, then the image is displayed in place of the default blue icon.

Configure ONU Name

Click EDIT. At the top of the card above the ONU picture, there will be an input box where you can type in any name with no restrictions for the new ONU name. Click SAVE to apply your changes.

Configure ONU Picture

Click EDIT. Where the "Picture" label was before you will see a dropdown list of all of the ONU pictures in your database. Select the one you want to see a preview of. (If you do not see the picture you want, you can add pictures by going to: Global Config, Files, Pictures tab). Click SAVE to apply your changes.

Firmware

The ONU Firmware tab provides information about the installed firmware on this ONU. The Upgrade Status field refreshes during a firmware upgrade to reflect the progress/status. The currently running version is shown along with some identifying information about the ONU, such as it's model number.

The image displays two versions of the 'ONU Firmware' configuration page. The left version shows the 'EDIT' button, while the right version shows the 'SAVE' and 'CANCEL' buttons.

ONU Firmware

Bank Pointer: 0

Bank 0:

- File: WAG-0F2WW_bcm96858GWOVTBXGPON_V1.0.21.w
- Version: V1.0.21

Bank 1:

- File: WAG-0F2WW_bcm96858GWOVTBXGPON_nand_fs_V1.0.20.w
- Version: V1.0.20

OMCI Download Parameters

Max Window Size [bytes]: 16 - 256 [bytes]

Backoff Divisor: 1 - 2

Backoff Delay: 1 - 10 [Seconds]

Max Retries: 1 - 10

End Download Timeout [Seconds]: 0 - 600 [Seconds]

State

Upgrade Status: Successful

Current Version: V1.0.21

ONU Model: 0F2WW

Equipment ID: H1.0

Hardware Version: H1.0

EDIT

ONU Firmware

Bank Pointer: 0

Bank 0:

- State Version: V1.0.21
- Config Version: (0F2WW) V1.0.21

Bank 1:

- State Version: V1.0.20
- Config Version: (0F2WW) V1.0.20

OMCI Download Parameters

Max Window Size: 16 - 256 [bytes]

Backoff Divisor: 1 - 2

Backoff Delay: 1 - 10 [Seconds]

Max Retries: 1 - 10

End Download Timeout: 0 - 600 [Seconds]

State

Upgrade Status: Successful

Current Version: V1.0.21

ONU Model: 0F2WW

Equipment ID: H1.0

Hardware Version: H1.0

SAVE CANCEL

Upgrade ONU Firmware

Click EDIT to update the firmware options. The user can select the active firmware bank and what firmware version to assign to each bank. **Note:** only Bank 0 is available in 10G EPON Mode. Use the “Bank Pointer” drop-down to select which firmware bank should be active and used. All compatible firmware images within the database, and the firmware currently installed (if not found in the database) are presented as options for each file bank. The options are listed by the compatible ONU model then version. After selecting the desired ONU firmware versions for each bank, click SAVE. This updates the ONU configuration and triggers a download of the new firmware(s) if needed.

Disable ONU Firmware Upgrade

To disable firmware upgrade on an ONU, click EDIT. Select the “Upgrade Disabled” option from the “Bank Pointer” selection. For each Bank, set the “Config Version” field to ‘None’. Click SAVE. Note: this action does not cancel a firmware upgrade if it is already in-progress.

CPEs

Note: Displaying CPE information requires the Authentication or DHCP Host Processing function to be enabled in the PON Controller.

The CPEs tab lists CPEs attached to the ONU which have been learned through 802.1X authentication and DHCP Relay. For each learned CPE, the table includes the CPE ID (MAC Address), 802.1X State, IPv4 Address, DHCPv4 State, DHCPv4 Lease Time, IPv6 Address, DHCPv6 State, and DHCPv6 Valid Lifetime. Each row of the table can be expanded to display all available state information for a specific CPE.

Note: the table filter only applies to the values listed in the main columns, not the data within the expandable rows.

CPEs on this ONU							
REFRESH							
Filter							
ID ↑	802.1X State	IPv4 Address	DHCPv4 State	DHCPv4 Lease Time	IPv6 Address	DHCPv6 State	DHCPv6 Valid Lifetime
11:11:11:11:11:11	Success	10.1.23.141	ACK	120	2001:192:168:50::100	ACK	2021-05-24 18:31:45
CNTL Version: R2.2.0-rc20 MAC Address: 8c:ec:4b:ab:02:13 OLT MAC Address: e8:b4:70:70:02:bc RADIUS User Name Override: NAS Identifier: nasnans NAS Port ID: bfws DHCPv4 State: ACK Client MAC: f0:00:11:43:00:f1 Client ID: 01f000114300f1 Client IP Addr: 10.1.23.141 Client Req'd IP Addr: 10.1.23.141 Server ID: 10.1.23.1 Circuit ID: bfw172 Remote ID: bfw172 OLT Service ID: OLT-Service 0 UNICAST ID: 1156 Sub Options: - Create Time: 2021-06-09 22:41:04.936726 Lease Time: 120 Expire Time: 2021-06-10 22:20:43.586760 DHCPv6 State: ACK Client MAC: 94:c6:91:13:db:75 Client ID: Type: 0004 UUID: 04612144aa177773c930a4463aaf2abd Client IP Addr: 2001:192:168:50::100 Client Req'd IP Addr: 2001:192:168:50::100 Server ID: Type: 0001 HW: 0001 Time: 283671f8 LLA: 525400ddc5f9 Circuit ID: bfw172 Enterprise Number: 00ff11ff Remote ID: bfw172 OLT Service ID: OLT-Service 0 UNICAST ID: 1156 Sub Options: - Create Time: 2021-06-09 22:41:04.936726 Valid Lifetime: 2021-05-24 18:31:45.019345 Preferred Lifetime: 2021-05-24 18:31:45.019345							
11:11:11:11:11:22	Success	10.1.23.141	ACK	120	2001:192:168:50::100	ACK	2021-05-24 18:31:45
11:11:11:11:11:33	Success	10.1.23.141	ACK	120	2001:192:168:50::100	ACK	2021-05-24 18:31:45

CPEs may also be deleted from this tab. After clicking ‘Edit’ the user sees three delete buttons: Delete Selected, Delete Expired, and Delete All. To manually select CPE entries for deletion,

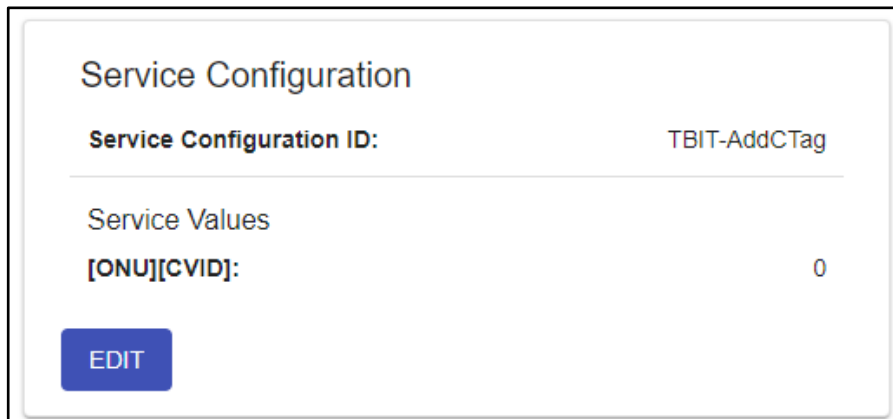
mark each CPE to be deleted by clicking the checkbox for that CPE in the 'Delete' column. Once all CPEs to be deleted are checked, click on the Delete Selected button. This removes all of the marked CPEs from the database. The Delete Expired button deletes all CPEs whose DHCPv4 and DHCPv6 State is "EXPIRED". Finally, the Delete All button removes all CPEs for this ONU from the database. These actions cannot be undone after completion.

Services

The Services tab contains all subscriber service-related configuration that applies to this ONU. This includes selection of the GPON OMCI or EPON DPoE service configuration to be programmed on the ONU, Service Level Agreements enforced by the OLT, VLAN tag matching and manipulation, DHCP Relay Agent Option 82, and 802.1X Authentication configuration. ONU Services contains four sub-tabs: Config, MIB Reset, MIB Config, and MIB Current. The Services Config sub-tab has multiple sections.

Config

The Config sub-tab contains service configuration for an ONU. The first tile displays the current service configuration with any service values if relevant.



Set the ONU Service Configuration

To edit an ONU's service configuration, use the first tile on the Config sub-tab. The current service configuration is displayed with any service values if relevant. There are three steps to configuring the ONU Service Configuration (SRV-CFG).

1. Select the Service Configuration ID for this ONU. There are several options to select from:
 - a. 'Disabled' - Disables service for this ONU.
 - b. 'Unmodified' - Configures the ONU with a service that forwards customer traffic applying no VLAN tag modifications.
 - c. 'Add CTag' - Configures the ONU to push/pop a C-Tag. If this service is selected, a CVID must be specified in Step (2).

- d. <SRV-CFG file> - All other values not listed above in a..c are [SRV-CFG](#) files stored in MongoDB. Depending on the file selected, additional Service Values may need to be configured in Step (2).
2. Set the Service Values for the selected configuration. These are typically VLAN IDs that need to be configured for the specific service.
3. Set the [Service Ports](#) for the service. This step applies when using the built-in 'Unmodified' and 'Add CTag' services only.

OLT Services

Under Service Configuration, there are eight accordions displayed, one for each OLT Service Port (0..7). Each accordion displays whether the service is enabled before it is opened. Once expanded, the various state and configuration items for the OLT Service are shown. The left image below shows all eight accordions for all eight OLT Services for a single ONU, and the right image shows OLT Service 0 after it has been expanded.

OLT Service 0	Enabled	▼
OLT Service 1	Disabled	▼
OLT Service 2	Disabled	▼
OLT Service 3	Disabled	▼
OLT Service 4	Disabled	▼
OLT Service 5	Disabled	▼
OLT Service 6	Disabled	▼
OLT Service 7	Disabled	▼

OLT Service 0

Enabled

^

Enabled:

true

Name:

SLA-CFG:

Max

DHCP Relay

Enable:

None

Remote ID:

Circuit ID:

Sub Options:

Enterprise Number:

54669

802.1X Authenticator

Enable:

false

RADIUS

NAS Identifier:

NAS Port ID:

User Name Override:

Default

MAC Learning

Learning Limit:

2046

VLAN Tagging

NNI Networks

s1.c1.c1

PON Networks

s1.c1.c1

EDIT

Enable OLT Service Ports

To enable an OLT Service, select the drop-down for the service to be enabled. Click the Edit button. The “Enabled” select contains options “True” and “False”. Set the selection to “True” and click Save. Enabling a service results in the PON Controller allocating and assigning a GPON Alloc ID and XGEMPort or EPON LLID to activate the service. Setting “Enabled” to “False” disables the OLT Service. This may take a few minutes to take full effect.

Set the SLA

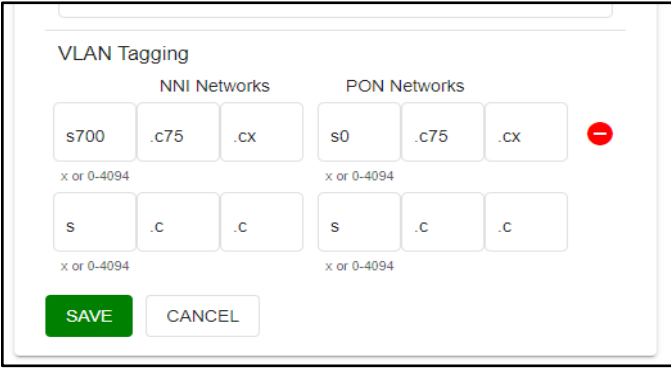
To configure the [SLA](#) of an OLT Service, select the drop-down for the service to be configured. Click the Edit button. Locate the select for “SLA-CFG”. Choose the desired SLA configuration from the options. Once the desired SLA is selected, click Save. This may take a few minutes to take full effect.

Configure VLAN Tagging

To configure the VLANs of an OLT Service, select the drop-down for the service to be configured. The VLAN tagging configuration is listed at the bottom of the OLT Service configuration form. Tagging is organized by NNI-side and PON-side tag formats. The NNI-side tags define the tag stack format for egress frames and match format for ingress frames on the OLT’s NNI port. Likewise, the PON-side tags define the tag stack format for frames transmitted and received on the OLT’s PON port. If the NNI-side tags are not equal to the PON-side tags, the OLT performs VLAN tag translation, push, or pop operations to produce the configured tag format.

Add a VLAN

To add a VLAN tag to an OLT Service, select the drop-down for the service to be configured and click the Edit button. Enter the VLAN tag stack S-Tag, outer C-Tag, and inner C-Tag values. Illegal tag and conflicting tag formats are flagged and highlighted to the user when adding or modifying VLAN tags. The user is allowed to save changes only when all inputs are valid. If the changes are not desired and should not be saved, click the CANCEL button to exit the edit view and discard the changes.



The screenshot shows a "VLAN Tagging" configuration window. It is divided into two main sections: "NNI Networks" and "PON Networks". Each section contains three input fields for the tag stack: S-Tag, outer C-Tag, and inner C-Tag. Below each set of fields is a note: "x or 0-4094". In the "NNI Networks" section, the values are s700, .c75, and .CX. In the "PON Networks" section, the values are s0, .c75, and .CX. A red minus sign icon is visible to the right of the "PON Networks" fields. At the bottom of the window are two buttons: a green "SAVE" button and a white "CANCEL" button.

Remove a VLAN

To remove a VLAN of an OLT Service, select the drop-down for the service to be configured. Click the Edit button. To remove VLAN tags from the configuration, click on the red minus circle to the right of the row.

Enable DHCP Relay

Note: DHCP Relay requires the DHCP Host Processing function to be enabled in the PON Controller.

UMT encapsulation can be enabled for both DHCPv4 and DHCPv6.

To enable UMT encapsulation of the DHCP Relay for a service, first select the drop-down for the service to be configured and click the Edit button. Following this, set the DHCP Relay Enable dropdown to either; DHCPv4 Only, DHCPv6 Only, or DHCPv4 and DHCPv6. These selections program the OLT to forward the selected DHCP messages over a UMT tunnel to the DHCP Relay Agent Host Processing function in the PON Controller. Enter values for Circuit ID, Remote ID, and Enterprise Number and click 'Save'. When DHCPv4 Relay is enabled, the DHCP Relay Agent inserts Option 82 in DHCP messages received from the client. When DHCPv6 Relay is enabled, the DHCP Relay Agent sets the Circuit ID value as the DHCPv6 Interface-Id (Option 18) and combines the Enterprise Number value with Remote ID to set OPTION_REMOTE_ID (37) in relay forward messages. Set the Enable dropdown to 'None' to disable this feature.

DHCP Relay must also be configured for the NNI Network configured for this service. See Enable DHCP Relay in NNI Network for more information.

Service Ports

The Service Ports tile is used to configure and enable service for specific ports on the ONU. This configuration only applies when the ONU is configured for 'Unmodified' or 'Add CTag' built-in services. This tile lists all of ONUs Virtual Ethernet Interface Ports (VEIPs) and physical ports available on the ONU. Both virtual and physical ports may be present, depending on the type of

ONU. In this case, the user is given the option to select between the virtual and physical ports for the service.

Service Ports

Virtual Ports	Physical Ports
513	257 UNI-ETH 1
	258 UNI-ETH 2
	259 UNI-ETH 3

EDIT

The MIB Reset and MIB Current sub-tabs display the MIB Reset State and MIB Current State respectively, as expansion trees. All keys at each level of the tree are sorted alphabetically for viewing.

MIB CUR State

Updated: 6/17/2021, 1:25:39 PM

REFRESH

- ▼ AniG
 - > 32769
- ▼ Cardholder
 - ▼ 256

actual_equipment_id:
actual_plugin_unit_type:254
expected_equipment_id:

MIB RST State

Updated: 6/14/2021, 11:07:12 AM

REFRESH

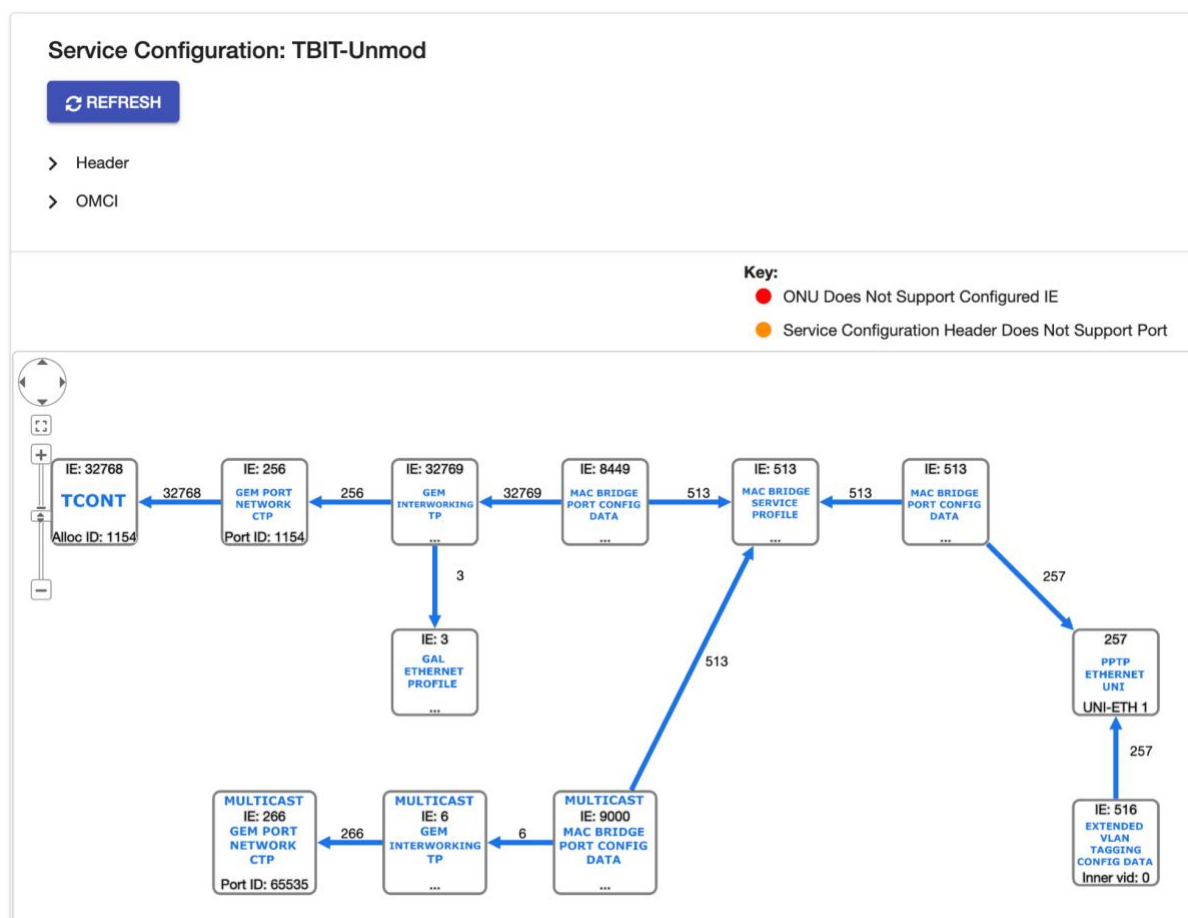
- ▼ AniG
 - > 32769
- ▼ Cardholder
 - ▼ 256

actual_equipment_id:
actual_plugin_unit_type:254
expected_equipment_id:
expected_plugin_unit_type:0

The MIB Config sub-tab displays detailed information about the ONU's service configuration. If the ONU is assigned a SRV-CFG file, this tab displays the configuration using the same expandable tree structure as the MIB Reset and MIB Current sub-tabs. The MIB configuration is not available to display when the ONU service configuration is disabled or is using the built-in

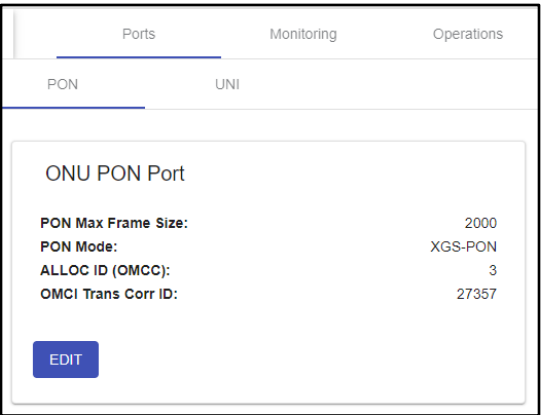
Unmodified or Add CTag services. The OMCI diagram depicting the data flow path for that Service Configuration is displayed under the MIB configuration tree tile.

Note that the MIB Reset and MIB Config sub-tabs only apply to GPON ONUs, and do not have content for 10G EPON ONUs.

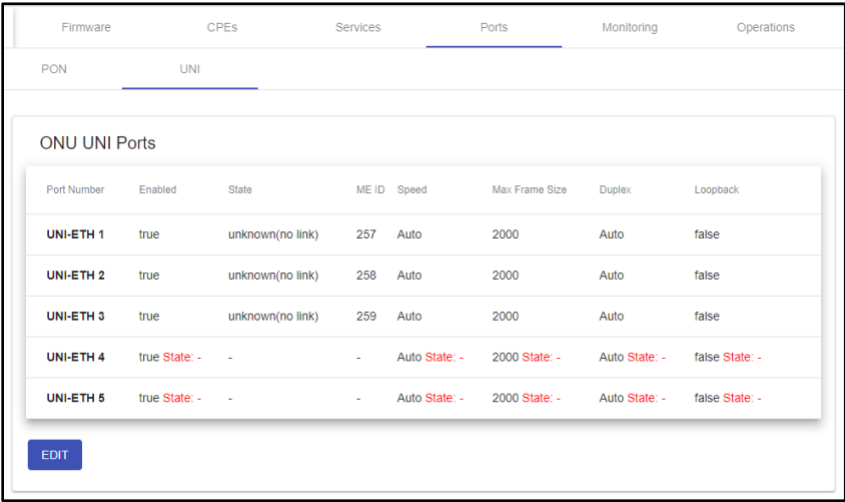


Ports

The ONU Ports tab contains two sub-tabs: PON and UNI. The PON sub-tab lists the values for the ONU PON Max Frame Size, PON Mode, OMCC ALLOC ID (if applicable), and OMCI Trans Corr ID. The PON Max Frame Size attribute is also editable from this sub-tab.



The UNI sub-tab shows a table with five rows, each representing a UNI port. The image shown below is for an ONU which has three UNI ports. Listed in the table are the Enabled, State, ME ID, Speed, Max Frame Size, Duplex, and Loopback values for each UNI port. All of these values except for State and ME ID are editable for each UNI port. The State and ME ID columns are hidden while editing.



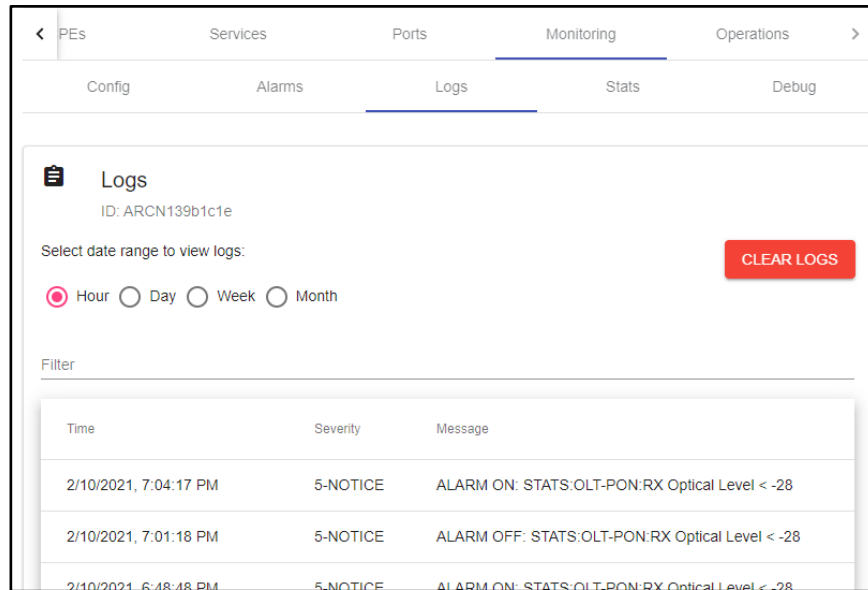
Monitoring

ONU Monitoring contains five sub-tabs: Config, Alarms, Logs, Stats, and Debug. The Config tab allows the user to view and edit the ONU's alarm profile.

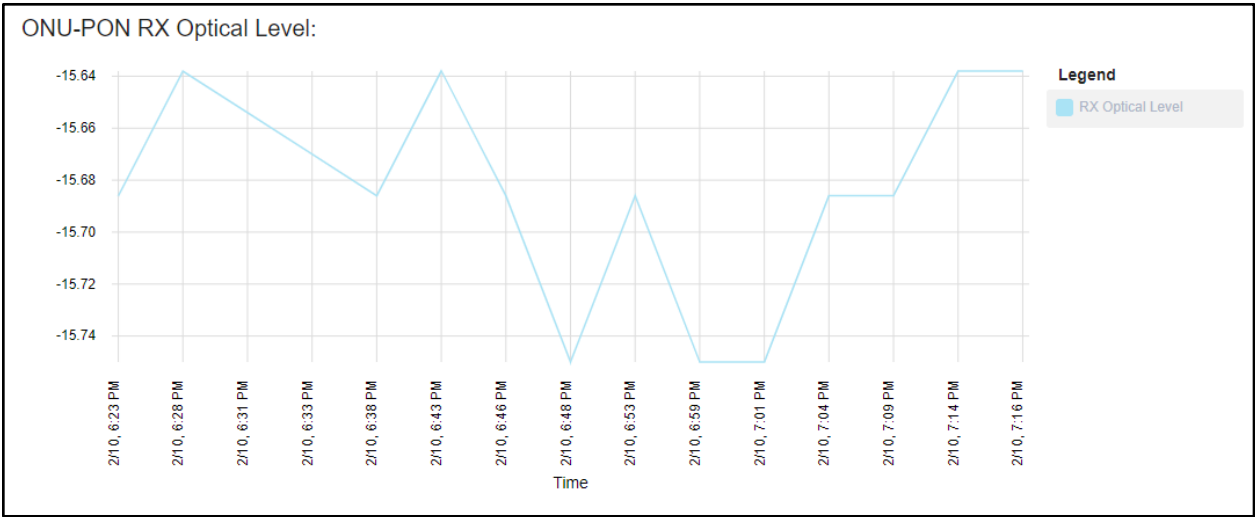
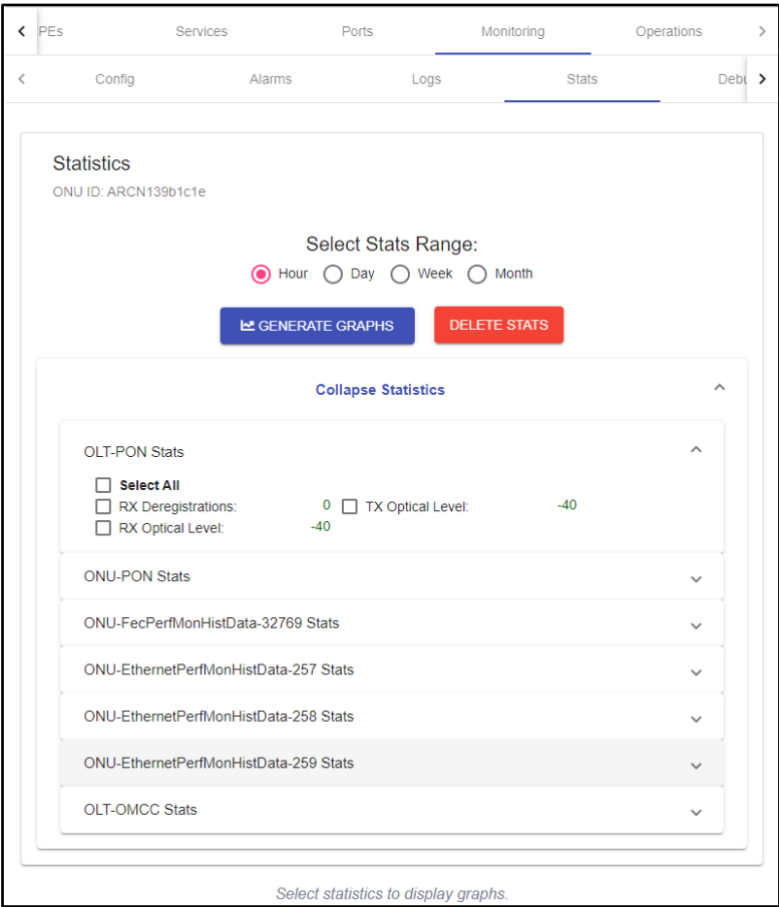
The Alarms sub-tab displays the same table seen on the Summary tab to see the active alarms in detail.

The Logs tab provides the user with all logs for this ONU that exist within the selected time range of one Hour, Day, Week, or Month. There is also an option to clear all existing logs for

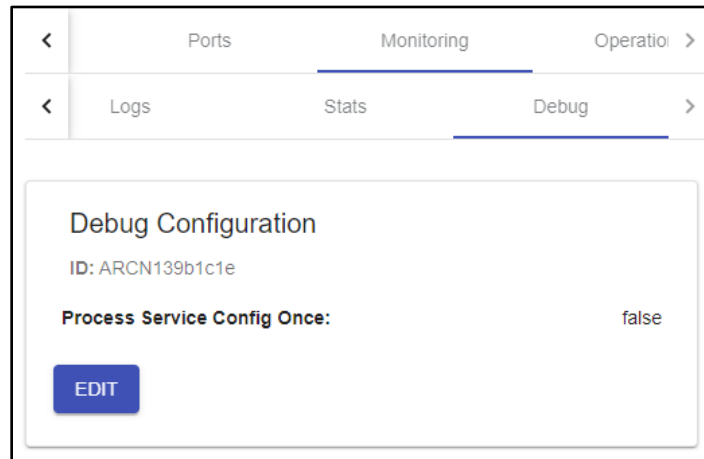
this ONU. Upon clicking this, the user is prompted to confirm the deletion. If confirmed, all logs for this ONU are removed from the database. This cannot be undone.



The Stats sub-tab for an ONU has the ability to graph the selected statistics for this ONU over the selected time range. The user may choose to see stats from the last Hour, Day, Week, or Month. To view selectable stats, the user may open the “Show Statistics” accordion. The statistic groups shown are all the groups that exist in the chosen time range. Changing the time range may add to or remove from these groups. Each group has a list of all statistics that may be graphed within its accordion. The most recent value of the statistic is shown next to the name. Check the boxes for the statistics desired to be graphed and click “Generate Graphs”. This briefly loads and then displays a graph for each statistic chosen within the time range selected. The user may also delete all statistics for this ONU. If “Delete Stats” is clicked, the user is prompted to confirm. After confirmation, all statistics for this ONU are deleted. This cannot be undone.



The final sub-tab for ONU Monitoring is the Debug tab. This view allows the user to perform the Process Service Config Once action for this ONU. See TN026 MCMS PON Controller Release Notes for details.



Operations

There are up to five (depending on the PON Mode) actions available for an ONU: Reset, Allow ONU Registration, Disable ONU Laser, and Delete.

Reset the ONU

Click the 'RESET' button to reset an ONU. When clicked, the Reset button prompts the user to confirm the Reset action with a popup. Once confirmed, this will trigger the ONU to restart. This process may take several minutes.

Allow ONU registration

When an OLT detects a faulty ONU on the PON (e.g., ONU transmitting over other ONUs), the OLT restricts the ONU's access to the PON and transitions the ONU to the Disallowed Error state. The Allow ONU Registration operation clears the Disallowed Error State condition for this ONU. Click the 'ALLOW REGISTRATION' button to clear the Disallowed Error for this ONU. The 'ALLOW REGISTRATION' button is disabled when the ONU is not in the Disallowed Error state.

If the OLT is busy in the process of allowing reigration for a different ONU, the message 'Allow ONU Registration operation is in progress . . .' is displayed and the 'ALLOW REGISTRATION' button is disabled. Wait for the OLT to complete the pending Allow ONU Registration operation before attempting the Allow Registration operation for this ONU.

Disable ONU Laser

The Disable ONU Laser operation is available for EPON devices only. To disable the ONU laser for a period of time, enter an integer within 1 to 60 in seconds into the field 'Disable Time Period'. Then, click the 'DISABLE' button to disable the ONU laser for the period of time defined above.

Delete the ONU

Click 'DELETE' to remove the ONU from the system. The Delete action removes all configuration, state, statistics, and logging data for this ONU from the database. This also removes the ONU from any OLT Inventories. After the delete action is confirmed, it cannot be undone.

Reset ONU
Restart this ONU
RESET

Delete ONU Data
Remove this ONU and it's records from the database
DELETE

Allow ONU Registration
Clear this ONU from the Disallowed Error state for ALL OLTs
ALLOW REGISTRATION

Global Config

Global configurations can be created, configured, and deleted from the Global Config tab.

Alarms

The Alarms tab and relevant device sub tabs are used for viewing, creating, editing, and deleting alarm configurations that can be set in a device's configuration.

Alarm Configurations for Controller
Version: R2.1.1

Select Alarm Configuration
Default

CREATE DUPLICATE DELETE

Search

Type	Section	Field	Operator	Value	Data Type	Severity
STATE	CNTL	Pause	IS	true	Boolean	2:Critical
STATE	CNTL	Shutdown	IS	true	Boolean	1:Alert
STATE	CNTL	CFG Read Failed	IS	true	Boolean	0:Emergency

Items per page: 5 1 - 3 of 3

EDIT

View and Edit Alarm Configurations

Select an existing alarm configuration via the 'Select Alarm Configuration' dropdown.

To add a new alarm criteria within the selected configuration, select the 'Edit' button on the bottom panel. Following this, select the 'Add' button also located on the bottom panel. This inserts a new row into the table that can then be configured. The 'Save' button is disabled until this additional row is completely configured. Once the alarm configuration has been edited, select the 'Save' button to update this configuration.

To delete an existing alarm criteria within a configuration, toggle the checkbox in the left-most column titled 'Delete'. When the 'Save' button is selected, the alarm criteria is removed from the configuration.

Alarm Configurations for Controller
Version: R2.1.1

Edit Configuration ID
Default

CREATE DUPLICATE DELETE

Search

Delete	Type	Section	Field	Operator	Value	Data Type	Severity
<input type="checkbox"/>	STATE *	CNTL *	Pause *	IS *	true	Boolean *	2:Critical *
<input type="checkbox"/>	STATE *	CNTL *	Shutdown *	IS *	true	Boolean *	1:Alert *
<input type="checkbox"/>	STATE *	CNTL *	CFG Read Failed *	IS *	true	Boolean *	0:Emergency *

Items per page: 5 1 - 3 of 3 |< < > >|

SAVE CANCEL ADD

Create an Alarm Configuration

On the top panel, select the button 'Create' to start a new alarm configuration. A configuration ID must be entered into the ID field for the configuration to be saved. The 'Create' button is disabled if currently creating a new configuration or when actively editing a configuration.

Alarm Configurations for Controller
Version: R2.1.2

New Configuration ID

CREATE DUPLICATE DELETE

Search

Delete	Type	Section	Field	Operator	Value	Data Type	Severity
<input type="checkbox"/>	*	*	*	*	*	*	*

Items per page: 5 1 - 1 of 1 |< < > >|

SAVE NEW CANCEL ADD

A new alarm configuration can be based on an existing Alarm configuration. Select the 'Duplicate' button on the top panel with the alarm configuration to be duplicated selected. The new ID for this duplicated configuration is the original ID with '-copy' appended to the end. Update the configuration ID and fields as desired and save. The Duplicate button is disabled if currently duplicating a configuration or when actively editing a configuration.

Delete an Alarm Configuration

To delete an existing alarm configuration, select the 'Delete' button on the top panel with the alarm configuration to be deleted selected. The Delete button is disabled if the 'Default' configuration is selected or when actively editing a configuration.

SLAs

The SLAs tab is used for viewing, creating, editing, and deleting SLA profiles that can be set in a device's configuration.

The screenshot shows the 'SLA Profile Configurations' page in the MicroClimate™ PON Manager. The left sidebar contains navigation links: Dashboard, Network, Global Config (selected), Alarms, SLAs, Services, Files, Databases, Devices, Accounts, Search, Logout, and Collapse. The main content area has tabs for Alarms, SLAs (selected), and Services. The SLA Profile Configurations section displays 'Version: R2.1.1' and a dropdown menu for 'Select Sla Configuration' with 'Min' selected. Below this are three buttons: CREATE (green), DUPLICATE (blue), and DELETE (red). The configuration details are organized into two sections: Downstream and Upstream. The Downstream section lists: Guaranteed Rate [kbps]: 128, Guaranteed Max Burst [bytes]: 256000, Best Effort Rate [kbps]: 0, and Best Effort Max Burst [bytes]: 256000. The Upstream section lists: Fixed Rate [kbps]: 0, Guaranteed Rate [kbps]: 128, Guaranteed Max Burst [bytes]: 409600, Best Effort Rate [kbps]: 0, Best Effort Max Burst [bytes]: 409600, Min Grant Period [100µs]: 0, Max Grant Period [100µs]: 40, Service Limit [kBytes]: 2, and Priority [1 Lowest, 8 Highest]: 1. An EDIT button is located at the bottom left of the configuration details.

Downstream	
Guaranteed Rate [kbps]:	128
Guaranteed Max Burst [bytes]:	256000
Best Effort Rate [kbps]:	0
Best Effort Max Burst [bytes]:	256000

Upstream	
Fixed Rate [kbps]:	0
Guaranteed Rate [kbps]:	128
Guaranteed Max Burst [bytes]:	409600
Best Effort Rate [kbps]:	0
Best Effort Max Burst [bytes]:	409600
Min Grant Period [100µs]:	0
Max Grant Period [100µs]:	40
Service Limit [kBytes]:	2
Priority [1 Lowest, 8 Highest]:	1

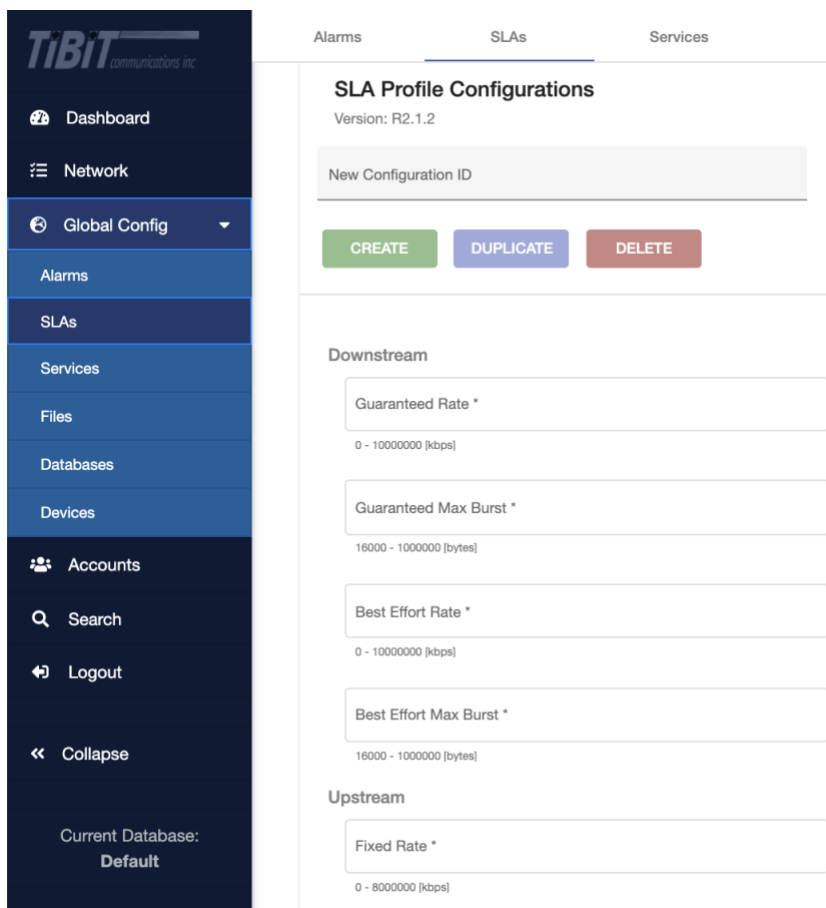
View and Edit SLA Configurations

Select an existing SLA configuration via the 'Select Sla Configuration' dropdown.

To edit an SLA configuration, select the 'Edit' button on the bottom panel. Once the SLA configuration has been edited, select the 'Save' button to update this configuration.

Create an SLA Configuration

On the top panel, select the 'Create' button to create a new SLA configuration. A configuration ID must be entered into the ID field for the configuration to be saved. The 'Create' button is disabled if currently creating a new configuration or when actively editing a configuration.



The screenshot displays the 'SLA Profile Configurations' interface. On the left, a dark sidebar lists navigation options, with 'Global Config' expanded to show 'SLAs'. The main panel has tabs for 'Alarms', 'SLAs', and 'Services', with 'SLAs' selected. The title 'SLA Profile Configurations' is followed by 'Version: R2.1.2'. A text input field for 'New Configuration ID' is present, along with 'CREATE', 'DUPLICATE', and 'DELETE' buttons. The 'Downstream' section contains four input fields: 'Guaranteed Rate *' (range 0 - 10000000 kbps), 'Guaranteed Max Burst *' (range 16000 - 1000000 bytes), 'Best Effort Rate *' (range 0 - 10000000 kbps), and 'Best Effort Max Burst *' (range 16000 - 1000000 bytes). The 'Upstream' section has one input field: 'Fixed Rate *' (range 0 - 8000000 kbps).

A new SLA configuration can be based off of an existing SLA configuration. Select the 'Duplicate' button on the top panel with the SLA configuration to be duplicated selected. The new ID for this duplicated configuration is the original ID with '-copy' appended to the end. Update the configuration ID and fields as desired and save. The Duplicate button is disabled if currently duplicating a configuration or when actively editing a configuration.

Delete an existing configuration

To delete an existing SLA configuration, select the 'Delete' button on the top panel with the SLA configuration to be deleted selected. The Delete button is disabled if the 'Min' or 'Max' configuration is selected or when actively editing a configuration.

Services

The Services tab is used for creating/editing/viewing different Service Configurations that can be later set in an ONU configuration.

Service Profile Configurations

Version: R2.0.0

Select Service Configuration
ALPH-4VLAN4TC

CREATE

DUPLICATE

DELETE

> Header

▼ OMC

> GalEthernetProfile | 3. #0

> Tcont | 32768, 32769, 32770, 32771, #1

> GemPortNetworkCtp | 256, 257, 258, 259, #2

> MacBridgeServiceProfile | 513, #3

> GemInterworkingTp | 32768, 32769, 32770, 32771, #4

> Ieee8021pMapperServiceProfile | 32768, 32769, 32770, 32771, #5

> MacBridgePortConfigurationData | 8449, 8450, 8451, 8452, #6

> VlanTaggingFilterData | 8449, 8450, 8451, 8452, #7

> MacBridgePortConfigurationData | 517, #8

> ExtendedVlanTaggingOperationConfigurationData | 516, #9

EDIT

View and Edit Service Configurations

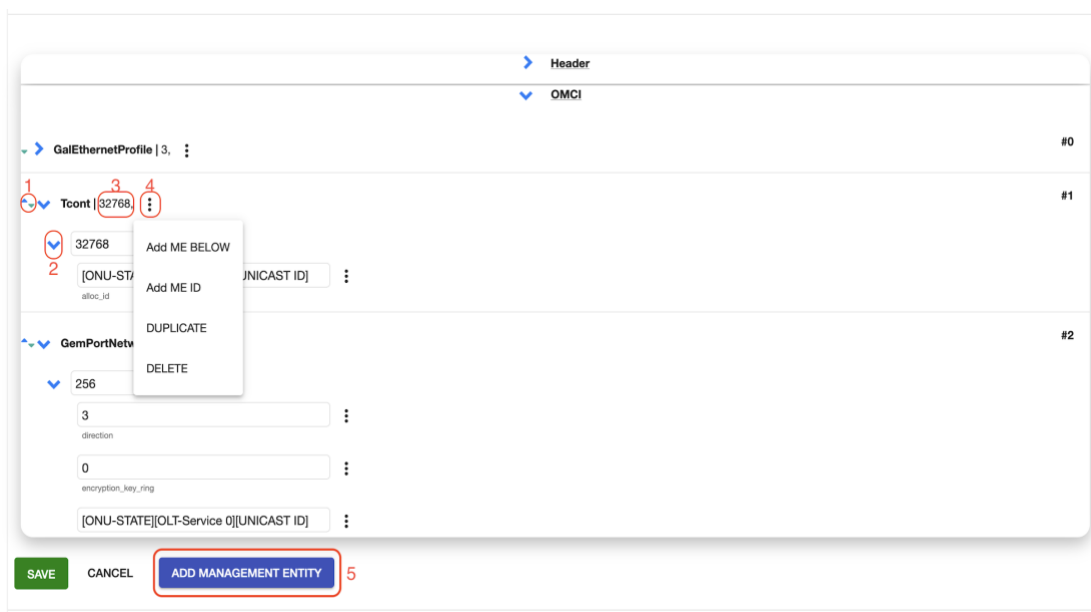
Select an existing service configuration via the 'Select Service Configuration' dropdown.

To edit a Service configuration, select the 'Edit' button on the bottom panel. Once the Service configuration has been edited, select the 'Save' button to update this configuration.

The datatype of a field is currently inferred. If the input is a number, it is stored as a number. Otherwise, the input is stored using a string representation.

The top configuration section titled "Header" can be used to edit the title, add inputs, add ports, as well as create and add to Compatibility tables.

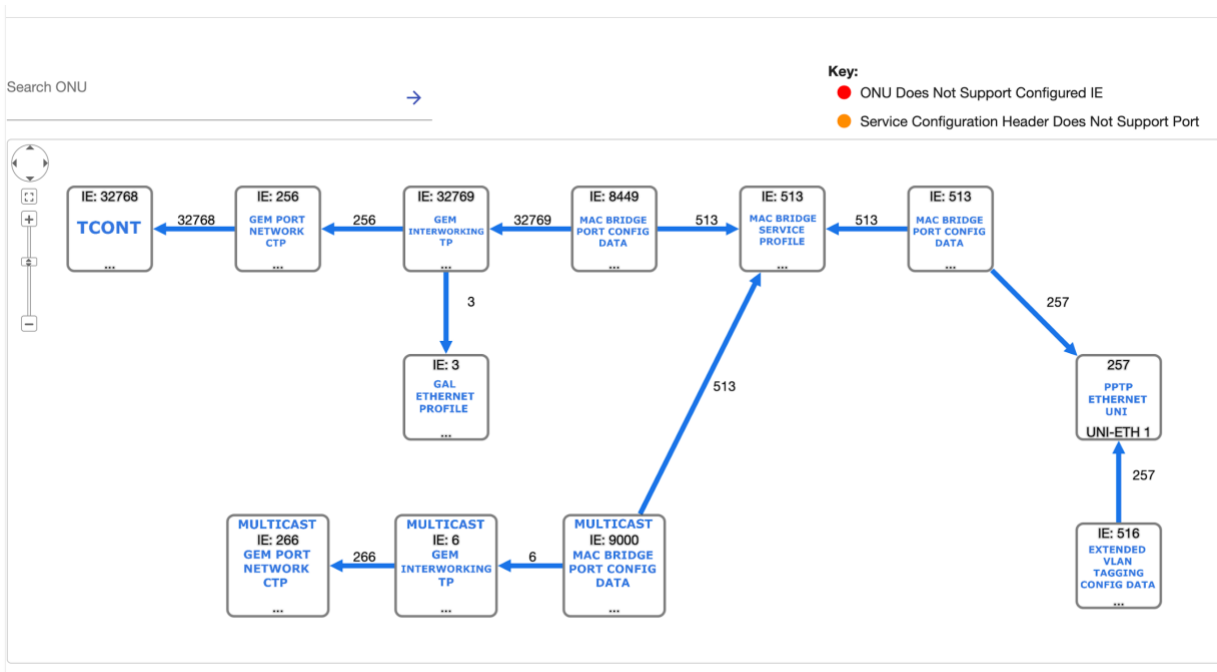
The bottom configuration section titled "OMCI" can be used to traverse a Service configuration. The ME, IE, Attribute, and value can be viewed and edited.



1. To shift the position of an ME within the service configuration, toggle the up and down arrows left-most of the Management Entity
2. Expandable sections have a blue chevron next to them. Clicking this chevron toggles expansion and collapsing of the section.
3. Currently configured ME IDs can be quickly viewed to the right-most position of the Management entity.

- Service configuration elements that support multiple actions beyond editing have a clickable ellipsis next to them that displays a menu of actions.
- To add a new management entity to the selected configuration, select the 'edit' button on the bottom panel. Following this, then select the 'Add Management Entity' button also located on the bottom panel. This brings up a popup that steps through configuring an ME. After the ME has been added via the popup, select the 'Save' button to update this configuration.

When a valid service configuration is selected, a diagram depicting the data flow path can be viewed. If desired, using the search bar in the top-left hand corner of the diagram pane, a specific ONU can be applied to see the behavior with that ONU MIB configuration. To do so, search for the desired ONU and select it within the dropdown that appears when typing in the "Search ONU" field. After selecting the ONU, click the blue arrow to the right of the field. It may take a few moments for the ONU-specific information to be applied to the diagram



Create a Service Configuration

On the top panel, select the 'Create' button to start a new Service configuration. A configuration ID must be entered into the ID field for the configuration to be saved. The 'Create' button is disabled if currently creating a new configuration or when actively editing a configuration.

A new Service configuration can be based off of an existing Service configuration. Select the 'Duplicate' button on the top panel with the Service configuration to be duplicated selected. The new ID for this duplicated configuration is the original ID with '-copy' appended to the end. Update the configuration ID and fields as desired, and save. The Duplicate button is disabled if currently duplicating a configuration or when actively editing a configuration.

Delete an existing configuration

To delete an existing Service configuration, select the 'Delete' button on the top panel with the Service configuration to be deleted selected. The Delete button is disabled when actively editing a configuration.

Files

The Files tab is used for uploading and deleting files as well as editing the metadata of firmware and pictures.

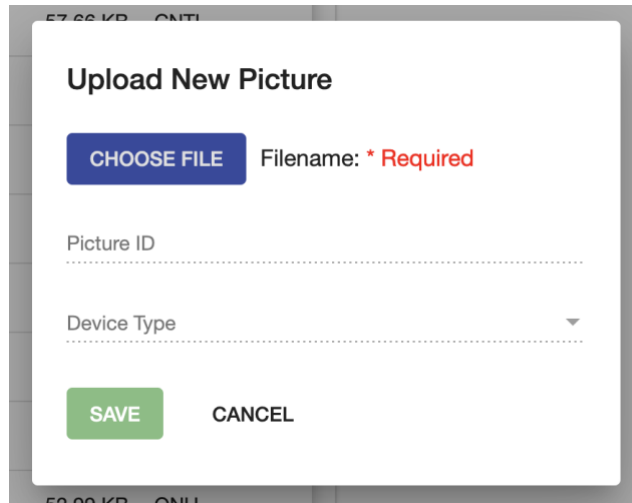
The screenshot displays the 'Files' tab in the MicroClimate™ PON Manager. The left sidebar shows the 'Files' option selected. The main content area is titled 'Pictures in Database' and contains a table with the following data:

ID	Filename	Size	Device Type
21.08.26 Juniper 740-117808 EML C-Temp_flip	21.08.26 Juniper 740-117808 EML C-Temp_flip.png	29.41 KB	OLT
ACX5448_Front	ACX5448_Front.png	129.11 KB	SWI
Juniper 740-117808 C-Temp	Juniper 740-117808 C-Temp.jpg	28.72 KB	OLT
Juniper 740-124448 I-Temp	Juniper 740-124448 I-Temp.jpg	28.70 KB	OLT
OLT-JNPR-C-SFP	PIC-OLT-JNPR-C-SFP.jpg	24.02 KB	OLT
PIC-CNTL-NUC	PIC-CNTL-NUC.jpg	38.04 KB	CNTL
PIC-Juniper-ACX5448	ACX5448_Front.png	129.11 KB	SWI
PIC-OLT-JNPR-C-SFP	PIC-OLT-JNPR-C-SFP.jpg	24.04 KB	OLT
PIC-OLT-Juniper-C-Temp	Juniper 740-117808 C-Temp.jpg	28.72 KB	OLT

Below the table, there are two buttons: 'EDIT' and 'UPLOAD'.

Uploading

The following section describes the upload process for each type of file;



The screenshot shows a modal dialog titled "Upload New Picture". It contains a blue "CHOOSE FILE" button. To the right of the button is the text "Filename: * Required" in red. Below this is a text input field labeled "Picture ID". Underneath is a dropdown menu labeled "Device Type". At the bottom left is a green "SAVE" button, and at the bottom right is a "CANCEL" button. The dialog is overlaid on a blurred background of the application interface.

Pictures

To upload a picture, select the 'Upload' button along the bottom panel. Then, select the "Choose File" button to bring up a file browser to select the desired image. Any file with a MIME type of 'image/*' can be used.

Firmware

To upload a firmware image, select the 'Upload' button along the bottom panel on the relevant OLT or ONU tab. Then, select the "Choose File" button to bring up a file browser to select the desired image. The OLT firmware upload accepts files of type '.bin'. The ONU firmware upload accepts files of any type.

Services

To upload a service configuration, select the 'Upload' button along the bottom panel. Then, select the "Choose File" button to bring up a file browser to select the desired configuration. Any file of type '.json' is accepted.

Editing and Deleting

The following section describes the editing and deletion process for each type of file;

The screenshot displays the PON Manager interface with the 'Files' tab selected. Under 'Files', the 'OLT Firmware' sub-tab is active. A modal window titled 'OLT Firmware in Database' is shown, containing a table of firmware entries. The table has columns for ID, Compatible Models, Version, Filename, and Size. Below the table are 'EDIT' and 'UPLOAD' buttons.

ID ↓	Compatible Models	Version	Filename	Size
R2.1.2-OLT-FW	180713	R2.1.2	R2.1.2-OLT-FW.bin	1.17 MB
R2.1.1-OLT-FW	180713	R2.1.1	R2.1.1-OLT-FW.bin	1.17 MB
R2.1.0-OLT-FW	180713	R2.1.0	R2.1.0-OLT-FW.bin	1.17 MB
R2.0.0-OLT-FW	180713	R2.0.0	R2.0.0-OLT-FW.bin	1.09 MB
R1.3.1-OLT-FW	180713	R1.3.1	R1.3.1-OLT-FW.bin	1.03 MB
R1.3.0-OLT-FW	180713	R1.3.0	R1.3.0-OLT-FW.bin	1.03 MB
R1.2.1-OLT-FW	180713	R1.2.1	R1.2.1-OLT-FW.bin	861.25 KB
R1.2.0-OLT-FW	180713	R1.2.0	R1.2.0-OLT-FW.bin	860.63 KB
R1.1.0-OLT-FW	180713	R1.1.0	R1.1.0-OLT-FW.bin	877.83 KB

Pictures

It is possible to delete or edit the device type of an uploaded picture. To do so, select the 'Edit' button along the bottom panel.

To delete a picture, toggle the checkbox in the left-most column titled 'Delete'. When the 'Save' button is selected, this picture is removed from the database.

To edit the device type of a picture, change the dropdown in the right-most column titled 'Device Type' to the desired type. Select 'Save'.

Firmware

It is possible to delete or edit the supported models and version of an OLT firmware image. It is also possible to delete or edit the vendor, supported models, and version of an ONU firmware image. To do so, select the 'Edit' button along the bottom panel on the appropriate tab.

To delete an OLT or ONU firmware image, toggle the checkbox in the left-most column titled 'Delete'. When the 'Save' button is selected, this image is removed from the database.

To modify the supported models of an OLT or ONU firmware image, change the checked options in the dropdown in the column titled 'Compatible Models' to the desired options. Select 'Save'.

Services

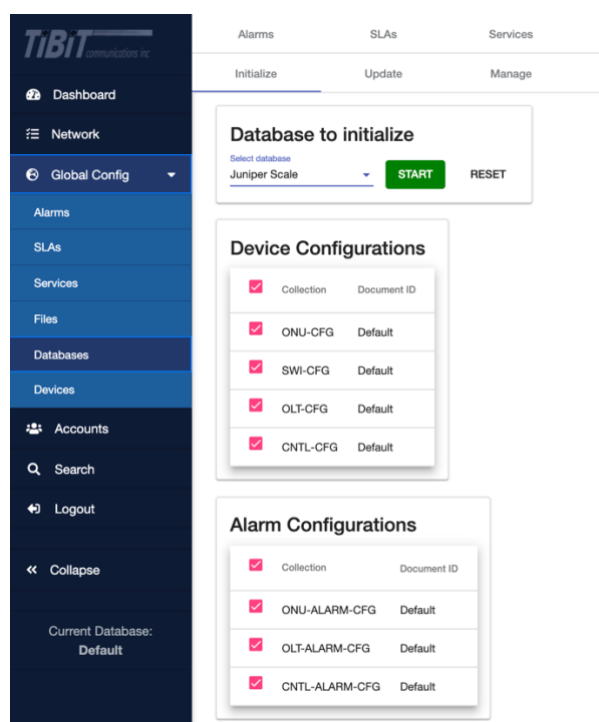
It is possible to delete or modify the version and title of a service configuration. To do so, select the 'Edit' button along the bottom panel on the appropriate tab.

To delete a service configuration, toggle the checkbox in the left-most column titled 'Delete'. When the 'Save' button is selected, this configuration is removed from the database.

Databases

The Databases tab is used for adding, removing, modifying, initializing, and updating databases for MCMS PON Manager.

Initialize



The MCMS PON Manager allows a user to initialize a database with default configurations, pictures, and firmware images. The user may select any of the SLA, Service, PON Controller, Switch, OLT, and ONU default configuration documents as well as default device pictures and

firmware images that come with the install package. The user may then choose a database from the existing list of configured databases. It is important to note that when inserting pictures, firmware or other large files, it may take a few minutes to complete the upload. After initialization, the inserted documents and files may be edited or modified as normal.

Update

The screenshot displays the MicroClimate™ PON Manager web interface. On the left is a dark blue sidebar with navigation links: Dashboard, Network, Global Config (expanded), Alarms, SLAs, Services, Files, Databases (selected), Devices, Accounts, Search, Logout, and Collapse. The main content area has tabs for Alarms, SLAs, Services, Files, Databases, and Devices. Under the 'Databases' tab, there are sub-tabs for Initialize, Update (selected), and Manage. The 'Update' sub-tab contains two main sections:

Version Count per Configuration Type

PON Controllers:	R2.1.1 (1)	R2.2.0 (1)
Switches:	R2.1.1 (1)	R2.2.0 (1)
OLTs:	R2.1.1 (1)	R2.2.0 (1)
ONUs:	R2.1.1 (1)	R2.2.0 (4)
PON Controller Alarms:	R2.1.1 (1)	
OLT Alarms:	R2.1.1 (1)	
ONU Alarms:	R2.1.1 (1)	
SLAs:	R2.1.1 (2)	

No Changes to Display
Select one or more configuration types to update

Select Configurations to Upgrade
Choose which configurations you would like to upgrade

Configuration Types: [v] From Version: [v] Filter: [v]

<input checked="" type="checkbox"/>	Document ID	Document Type	Version	Include Subtended
Items per page: 5 0 of 0 < < > >				

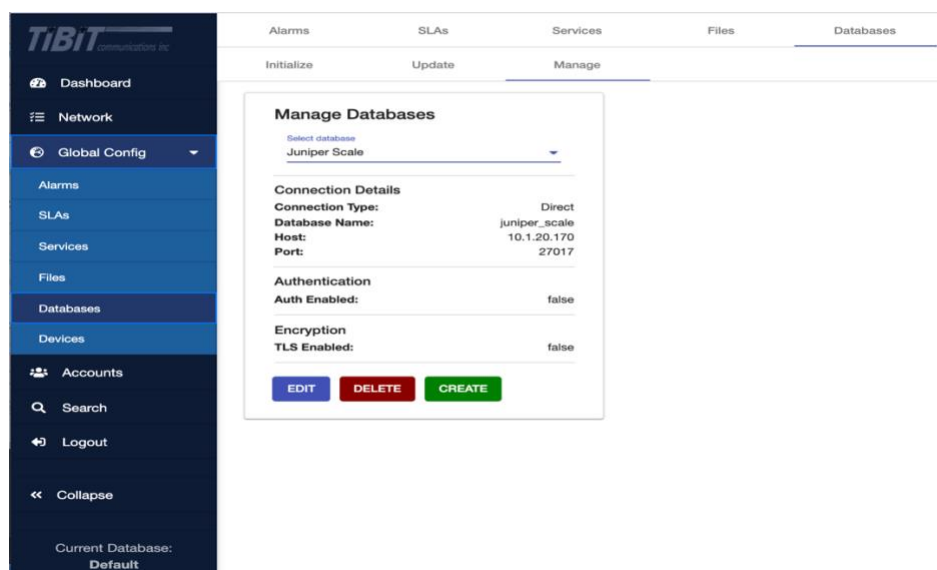
Current Database: Default

Note: Only one version update is allowed at a time. It is not possible to skip versions.

The Databases Update tab supports upgrading a database to use the latest configuration schemas. This allows a network to access the full capabilities of the PON Controller. This should be done for all devices, SLAs and alarm configurations on the network for each release.

When updating controllers, switches and OLTs, there is an option to update all subtended devices underneath that device as well. When updating OLTs, you must first specify under which controller or switch the OLTs are located. For updating ONUs you must specify under which switch or controller and OLT those ONUs reside. There is also an option to update every configuration on the network, by selecting the checkbox in the top left-hand corner of the table, in the header. Choosing this option overwrites any existing configurations already using the version to which you are upgrading.

Manage



The Databases Manage tab supports adding, modifying existing, and deleting databases from MCMS PON Manager.

Note: PON Manager users and user profiles are stored in the users database (e.g., juniper_users). The users database connection settings cannot be modified using the Web App. See the user_database.json configuration file.

Add a New Database

On the bottom of the panel, select the button 'Add' to create a new MongoDB database connection. A Database ID must be entered into the Database ID field on the top of the panel for the connection to be saved. The Database ID field is the name of the database as it appears in MCMS PON Manager. This does not necessarily have to be the Name of the database as it exists in MongoDB. See the section Configurable Fields to properly configure the new database connection. Click the save button to create the connection.

Modify Connection for an Existing Database

Select the database connection to be modified in the dropdown 'Select Database'

On the bottom of the panel, select the button 'Edit' to modify the selected database connection. See the section; Configurable Fields to properly configure the new database connection. Click the Save button to update the connection.

Delete an Existing Database

Select the database connection to be deleted in the dropdown 'Select Database'

On the bottom of the panel, select the button 'Delete' to remove the selected database connection. The Delete button will be disabled when the 'Default' database connection is selected. This connection cannot be removed.

Configurable Fields

The configurable fields for a database connection are as follows:

Key	Description
Database ID	Name of the database as it appears in the UI.
Connection Type	Direct - Connect to MongoDB instance via UI guided host, port and name Replica Set - Connecting to MongoDB replica set URI - Connect to MongoDB via raw URI
Database Name	Name of PON Controller database.
Host	Hostname/IP Address of your MongoDB server hosting the MongoDB instance.
Port	MongoDB server port number.
Enable Auth	Boolean specifying if the MongoDB server at <i>host:port</i> is using authentication.
Auth Database	Name of your MongoDB authentication database. (Available when Enable Auth is true)
Username	The username of the MongoDB user to authenticate with. (Available when Enable Auth is true)
Password	The password of the specified MongoDB user. (Available when Enable Auth is true)
Enable TLS	Boolean value specifying if the MongoDB server at <i>host:port</i> is using encryption.
CA Certificate Path	Path to the encryption certificate.

Devices

Pre Provision

The Devices Pre Provision tab is used for pre-provisioning PON Controllers, Switches, OLTs, and ONU device configurations.

The screenshot shows the 'Pre Provision' tab in the MicroClimate PON Manager. The left sidebar contains navigation links: Dashboard, Network, Global Config (expanded), Alarms, SLAs, Services, Files, Databases, Devices (selected), Accounts, Search, Logout, and Collapse. The main content area is titled 'Pre-Provision Device Creation' and features a vertical progress bar with steps: Choose a Device Type, Device Identification, Configuration Template, Inventory, and Submit. Below the progress bar is a 'New Configuration' section with the following details:

Device Type:	OLT
ID:	00:00:00:00:00:11
Name:	SFPP-10GE-OLT
Template:	Default
Parent PON Controller:	44:ec:ce:25:8d:39
Parent Switch:	44:ec:ce:25:8d:3c
Switch Port ID:	38

At the bottom of the 'New Configuration' section are three buttons: BACK, RESET, and SAVE.

A base configuration template is selected when configuring a new device. The new device being created is based on this base configuration template.

A new OLT and ONU configuration may be inventoried under a PON Controller and Switch or OLT, respectively, but is not required.

Search

The Search tab is a user's view into the database. From here, users can query the database to discover devices on their network that match a specified attribute for a requested value. The menu items that are listed are retrieved directly from the database and may show small changes when using different databases.

Search Devices on the Network

ONU

OLT

Controller

Switch

Filter Criteria

Collection *

Attribute *

Operator *

Value

OLT Configurations

OLT.PON Enable

All

Add Search Criteria

SEARCH

CLEAR FILTERS

<input type="checkbox"/>	Device	OLT Configurations OLT.PON Enable	Change Status
<input type="checkbox"/>	70:b3:d5:52:3b:84	true	-
<input type="checkbox"/>	70:b3:d5:52:34:9c	true	-
<input type="checkbox"/>	70:b3:d5:52:34:18	true	-
<input type="checkbox"/>	Default	true	-

NOTE: To avoid conflicts, only 1 bulk change can be made at a time.

Items per page: 5 1 - 4 of 4

Values that are returned from the database are placed in a table along with the MAC address of the device that matches the specified query. By clicking on the device ID in the table row, users can navigate to that device in the Network tab.

There are eight choices of operations for querying a database. “All” searches for all values while “Containing” looks for partial matches. The others are used for values that contain numbers with the exception of “=” which looks for an exact match.

Bulk Updating

The Search page also has another function, bulk updating. Most configurable fields can be bulk updated by first searching on that attribute name. If a field is available to be safely bulk updated, the row beneath the header row in the table of results will display an input field. Users can then select the devices they want to update, make their desired change on the input field and save by clicking the save icon. A response from the database will change the ‘Change Status’ column to indicate if the change was successful, pending or failed to save.

Note: Only 1 attribute can be updated at a time.

Accounts

The Accounts tab is used for creating, editing, viewing, and managing user profiles and roles. All users have the ability to update their first and last names as well as passwords. However, only a user that has been assigned the built-in Administrators role may view and edit the information of other users.

Personal

Personal Administration

User Profile

Email: juniper@juniper.net
First Name: First
Last Name: Last
Last Login: 9/7/2021, 10:18:55 PM

EDIT

Your Logs

Displaying logs from the last hour

☒ Hour ☐ Day ☐ Week ☐ Month

Filter

Time ↓	Action	Collections Accessed
9/8/2021, 5:18:56 AM	GET	ONU-STATE
9/8/2021, 5:18:56 AM	GET	CNTL-CFG, CNTL-STATE
9/8/2021, 5:18:56 AM	GET	OLT-CFG, OLT-STATE
9/8/2021, 5:18:56 AM	GET	databases.json
9/8/2021, 5:18:56 AM	GET	ONU-CFG, ONU-STATE

Items per page: 5 1 - 5 of 9 |< < > >|

The default view of the Accounts page is the Personal tab. This tab presents the email address, first name, last name, last login time, and user logs of the currently logged in user. The first tile allows the user to edit their first and last name as well as their password. The second tile displays the user action logs. All of the logs shown here are relevant to the logged in user only. It is possible to retrieve all logs within the last hour, day, week, or month and to sort and filter by the values in the table.

Change Password

To change the password of the currently logged in user click the Edit button of the first tile. To update the password, enter the new desired password in the Password field. To see what was entered as plain text, click on the eye icon at the right of the field. Re-enter the new password in the Confirm Password field. Click SAVE to confirm and accept the changes. These changes will take effect immediately and the new password will be required the next time the user logs in.

Administration

This tab is used to manage all user profiles, roles, as well as the user session timeout. It is only visible and available to users assigned to a role with the Accounts, Admin Read permission.

Users

Users are displayed in a table sorted alphabetically by email. Each user's email, first and last names, and assigned roles are listed as well as the creation date of the account and the last login time for the account. The table may be sorted by any column except for assigned roles. Each row is expandable by clicking to see the full list of the user's roles as a comma separated list. Administrators are able to edit any user's account details, assigned roles, view their assigned roles, or delete the user. However, Administrators do not have the ability to remove themselves from the Administrators role from their own account. If an administrator user needs to be removed from this role it must be done from a different administrator's account.

The screenshot displays the 'Administration' tab with the 'Users' sub-tab selected. The main content area is titled 'All Users' and features a filter input field containing '@juniper.net'. Below the filter is a table with the following data:

Email ↑	Last Name	First Name	Assigned Roles	Date Created	Last Login
juniper@juniper.net	Last	First	Administrators	9/7/2021, 10:18:27 PM	9/7/2021, 10:18:55 PM

At the bottom of the table, there are pagination controls showing 'Items per page: 10' and '1 - 1 of 1'. Below the table are two buttons: 'EDIT' (blue) and 'CREATE' (green).

Create a New User

Next to the Edit button on the main view, there is also a Create button. Clicking this button opens a dialog with inputs for a new user account. Email, first name, last name, roles, and a password must be provided for a new user account. However, it is optional to assign roles to a new user. The password inputs require a minimum length of ten characters. It is highly recommended that a user changes their password from the Personal tab after their first login with the created password. Once all required fields have been filled in and are valid, the new account may be created.

Create new user

Email *

Email

First Name *

First name may not be more than 30 characters

Last Name *

Last name may not be more than 150 characters

Password *

Password must be at least 10 characters long

Confirm Password *

Roles ▼

SAVE

CANCEL

Modify an Existing User

To edit existing users, click the Edit button at the bottom left of the table. The table columns vary slightly during edit, as the Date Created and Last Login values are not editable and new password fields are also added. From this view, a user with the Accounts Admin Update permission may edit the first and last names, assigned roles, and passwords of all users at once. The Confirm Password field is required once a value has been entered in the New Password field for that row. Once all desired changes have been entered and are valid, the Save button is enabled and the user may click Save. To clear these changes without saving click Cancel.

The screenshot shows the 'All Users' management interface. At the top, there are tabs for 'Personal' and 'Administration', with 'Administration' selected. Under 'Administration', there are sub-tabs for 'Users', 'Roles', and 'Sessions', with 'Users' selected. The main content area is titled 'All Users' and includes a filter input with the text '@juniper.net'. Below the filter is a table with the following columns: 'Delete', 'Email', 'Last Name', 'First Name', 'Assigned Roles', 'New Password', and 'Confirm Password'. The table contains one row for the user 'juniper@juniper.net'. The 'Last Name' field is labeled 'Last Name *' and contains the text 'Last'. The 'First Name' field is labeled 'First Name *' and contains the text 'First'. The 'Assigned Roles' field is a dropdown menu showing 'Roles' and 'Administrators'. The 'New Password' and 'Confirm Password' fields are empty. At the bottom of the table, there is a pagination bar showing 'Items per page: 10' and '1 - 1 of 1'. Below the table, there are two buttons: 'SAVE' (green) and 'CANCEL' (white).

Delete	Email	Last Name	First Name	Assigned Roles	New Password	Confirm Password
<input type="checkbox"/>	juniper@juniper.net	Last Name *	First Name *	Roles	New Password	Confirm Password

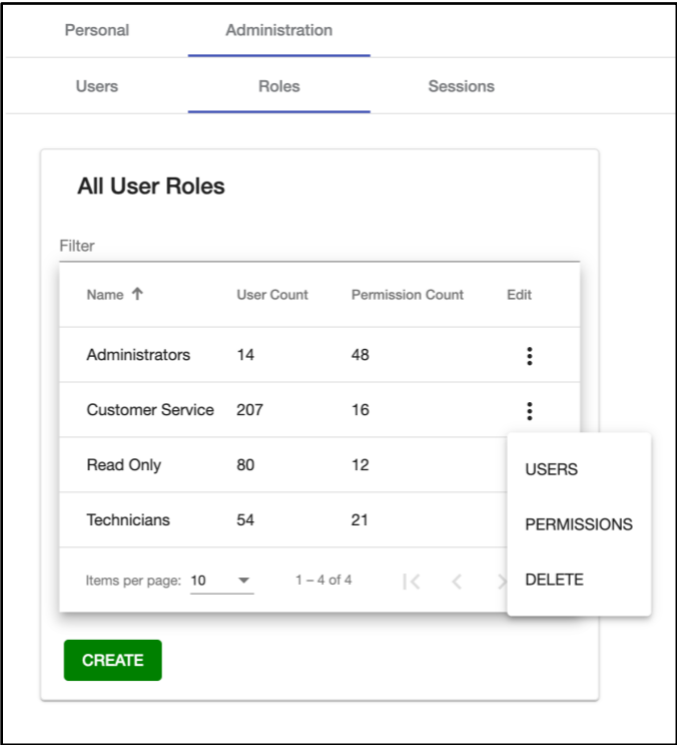
Delete a User

A user account can also be deleted from this view if the logged-in user has the Accounts Admin Delete permission. Deleting a user is done in the same view as editing. Click Edit at the bottom left of the table. For every user to delete, select the checkbox in the left-most Delete column. The inputs for that user's information become disabled. Upon save, any users with this box checked are deleted. Once saved, the deletion cannot be undone.

Roles

Upon switching to the Roles tab the following screen is shown. The table lists all system roles sorted alphabetically by name. For each role the user count and permission counts are displayed. The far right column, Edit, contains a menu to edit the users assigned to the role, permissions the role has, or to delete the role.

Note: The built-in ‘Administrators’ and ‘Read Only’ roles cannot have their permissions changed or be deleted.



Create a New Role

To create a new role, click on the green Create button at the bottom of the main Roles tab view. This opens a dialog with two inputs and a permissions table. The new role must be assigned a unique name. It is optional to assign users to the role upon creation. All read permissions except for Accounts Admin are selected by default and not removable. These permissions may be edited the same way as described above. After a unique name has been input, the new role can be created. The users and permissions can always be changed.

Create new role

Name *

Name

Users

Permission Type	Read	Update	Create	Delete	All
Accounts					
Admin	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dashboard					
Dashboard	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Global Config					
Alarms	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Databases	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Files	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Services	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SAVE

CANCEL

Modify an Existing Role's Users

By selecting the users option from the edit menu a dialog is displayed with two tables. The left table shows all users that are not a member of that role. The right shows all users that are. Users may be added to the role by selecting each user to add from the non members table, then the green right-facing arrow. They may also be removed by choosing the users from the members table and selecting the red left-facing arrow. The Save button is enabled once changes are made.

Edit Customer Service Role Assigned Users

Filter
@juniper.net

Non Members ↑

juniper@juniper.net

Filter

Assigned Members ↑

cs@juniper.net

→

←

SAVE **CANCEL**

When the permissions menu item is selected, a dialog containing all assignable permissions as checkboxes is displayed. All permissions that a role is currently assigned have that checkbox selected. Read permissions are not editable for any permission type except for Accounts Admin. Upon saving, all permissions with their checkboxes selected are given to the role.

To delete a user role, select the menu icon in the Edit column of the main Roles view table. Click on the Delete option. If the role contains no users, a prompt to confirm the deletion is displayed. Upon confirmation the role is deleted, This cannot be undone. If there are users assigned to the role, a warning message is displayed alerting the user that a role can not be deleted if it contains users. All users must be removed from the role before deleting.

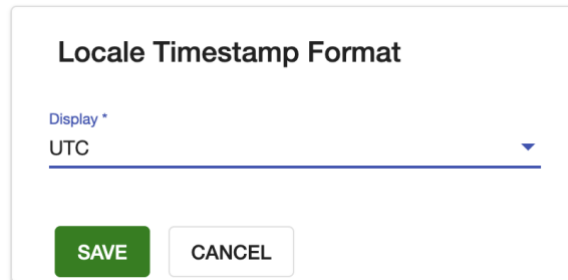
Note: the built in Administrators and Read Only roles cannot be deleted at any time.

The Sessions tab contains a single option to set the length of time in minutes for how long a user should remain logged in without activity. If a user is logged in and there is no activity from them within the time limit defined here, then they are automatically logged out and their session is invalidated.

Page 93

Display Preferences

The Display Preferences tab contains a single tile to adjust the timezone display format of the PON Manager. There are two options for timezone display, Local Time, and UTC. All timestamps within the PON Manager UI will be formatted based on this choice. When changed, the timezone display format will be updated for all users in the current database after they logout and login again or refresh the page. Note that changing this option does not change the format of timezones in the PON Controller database, only the display format within the PON Manager.



A dialog box titled "Locale Timestamp Format" with a light gray border. Inside, the text "Display *" is in blue. Below it, a dropdown menu shows "UTC" with a blue underline and a small blue triangle on the right. At the bottom, there are two buttons: a green "SAVE" button and a white "CANCEL" button with a gray border.