ISPadmin®

GPON

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Manual

Revisions records

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Introduction

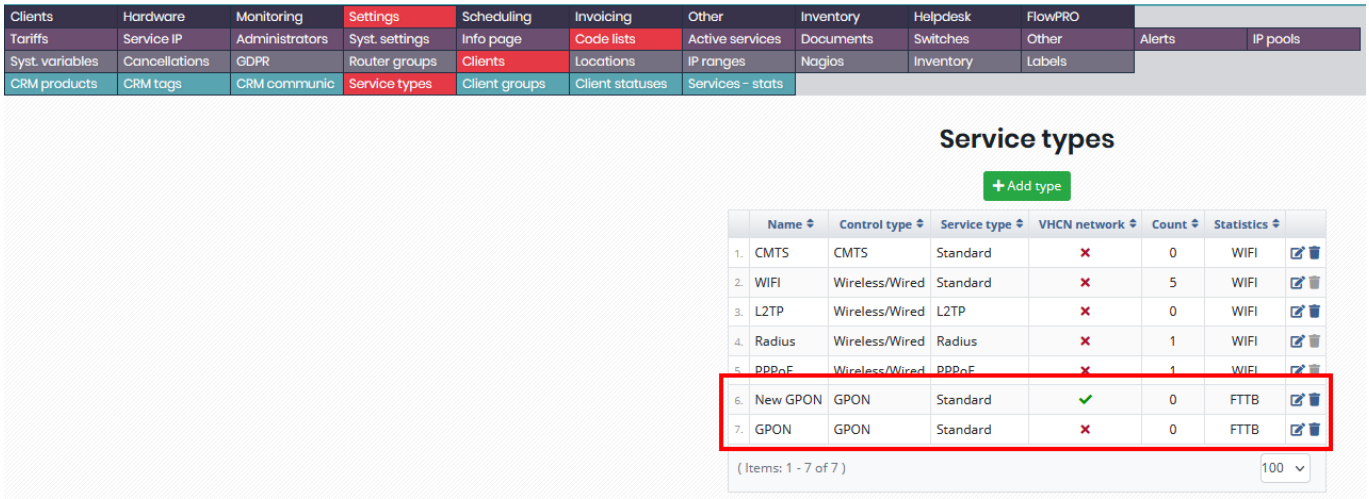
This module is intended for Internet and IPTV service management using the GPONtechnology. Currently, only Huawei OLT devices are supported (development based on the Huawei MA5608T). End devices are not limited to a particular manufacturer. You can use any ONT.

As a result, service management directly via the console is eliminated – everything will be automatically controlled by ISPadmin (**except setup of the OLT itself**).

ISPadmin communicates with an OLT via the SNMP protocol. All management for a specific activity is based on OID templates. As part of the management, backup copies of the current configuration are created. They are created after every change in function of the OLT (The communication protocol used for creation of valid configurations is Telnet).

1. General

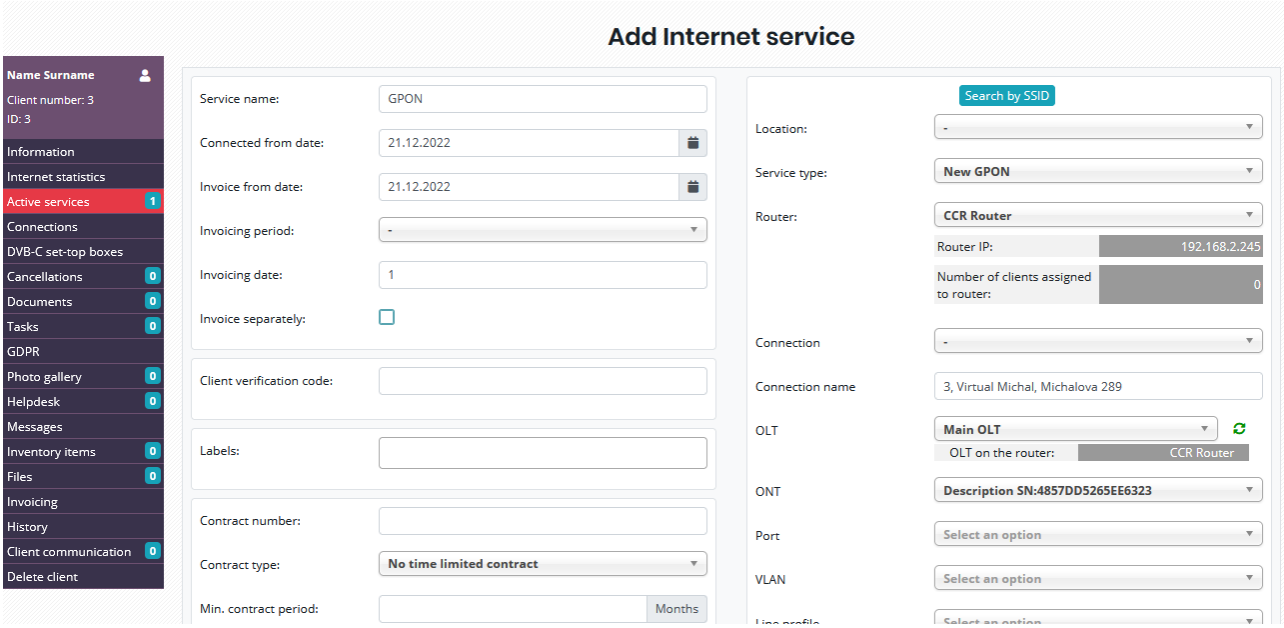
ISPadmin introduces a new type of Internet service management – GPON. All services with this type of management will be linked with a specified service port on a particular OLT and will continue to be automatically managed by ISPadmin (add to OLT, remove, change service parameters - DBA, SRV, LINE, TRAFFIC profiles, define and edit ONTs, specify native ports on ONTs, move ONTs to other ports on a given OLT or on a different OLT, automatically retrieve new ONTs in the system - so-called AutoFind, etc.).



This new type of management is interlinked with a new definition of tariffs. You can specify a tariff and then choose all types of services for which this tariff can be used (for example: CMTS, Wifi, Radius, GPON, customType, etc.).

With GPON comes a new term: Connections. You can define them on ONTs. You can link individual services (Internet, IPTV) with a particular connection, but always only one service type.

Created GPON services are handled similarly to, for instance, existing WiFi services. They are linked with a particular router which can perform shaping (see below), firewall, NAT, etc. All important service parameters (IP, MAC, NAT, installation address, invoicing, etc.) are entered into a similar form. The form, however, includes an additional section in which you can specify a connection and its properties.



An overview of defined connections can be found in Client card / Connections.

ISPadmin approaches the existing OLT configuration very adaptively. The integration process of existing OLTs and services set on those OLTs takes into account and adapts the defined services and creates an environment for integration of existing services into ISPadmin. This process will be described below.

ISPadmin requires that the basic and very specific OLT configuration is defined before the start of the integration process.

Mainly the following items:

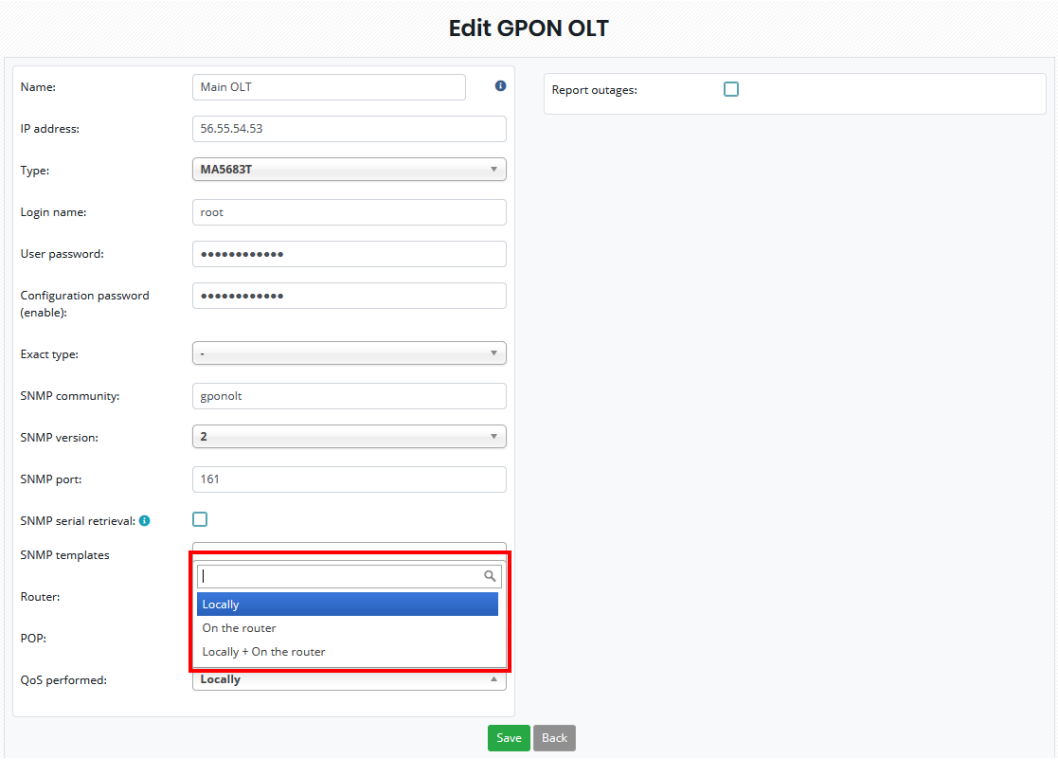
- Define VLANs on ports and slots
- Define traffic-tables
- Define access rights (SNMP, Telnet)
- Define srv-profiles, line-profiles, dba-profiles to be used in ISPadmin
- Enable the "autofind" method on ports (necessary for the automatic allocation of services to work correctly)
- Enable and configure multicast for IPTV
- Configure the network part (IP, routing, etc.)
- Configure slots on OLTs

2. Preparations for GPON implementation into ISPadmin

2.1. Define tariffs

GPON service speed management is performed based on the OLT configuration:

- **Locally**
- **On the router**
- **Locally + On the router**

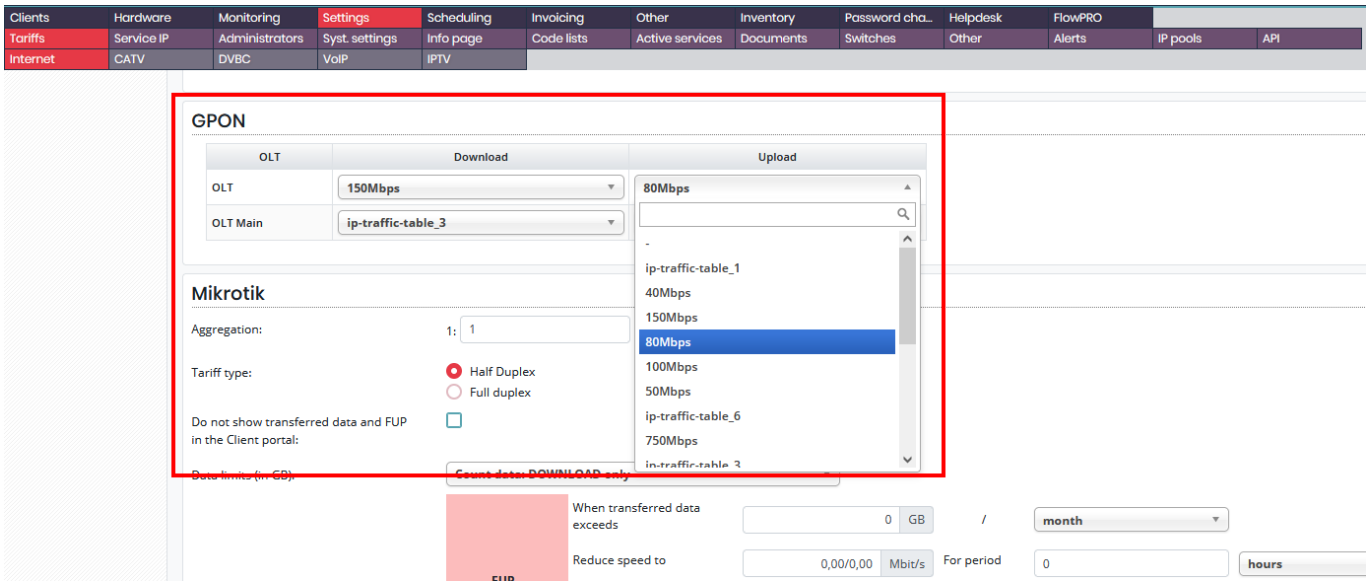


Locally – shaping is performed on the OLT only. The prerequisite is to have a defined tariff for GPON and a corresponding traffic_table created on the OLT by an administrator.

(It is necessary to carry out the initial data retrieval from the OLT first so that the traffic_table from the OLT can be offered.)

By assigning the retrieved traffic-tables to the download and upload directions on the OLT, you specify which speed profile is to be used for a given GPON service tariff when a service port on the OLT is created.

If no tariff is specified, no traffic-table will be assigned to the service port defined (no speed specification).



On the router – shaping is performed only on the router (or on its parent router) to which the OLT is assigned (specified in the OLT configuration). Service ports created on the OLT will be without traffic-tables.

Lokally + On the router – A combination of the above-mentioned options. Shaping is performed on the OLT as well as on the router (queue tree / simple queue).

2.2. Define VLANs

Each service (Internet, IPTV) sent via GPON to a client must be defined by its unique VLAN. Therefore, ISPadmin implements the VLAN definition to manage GPON services.

During initial retrieval (see below), a table of valid VLANs on a given OLT is created. This list can be modified based on your needs.

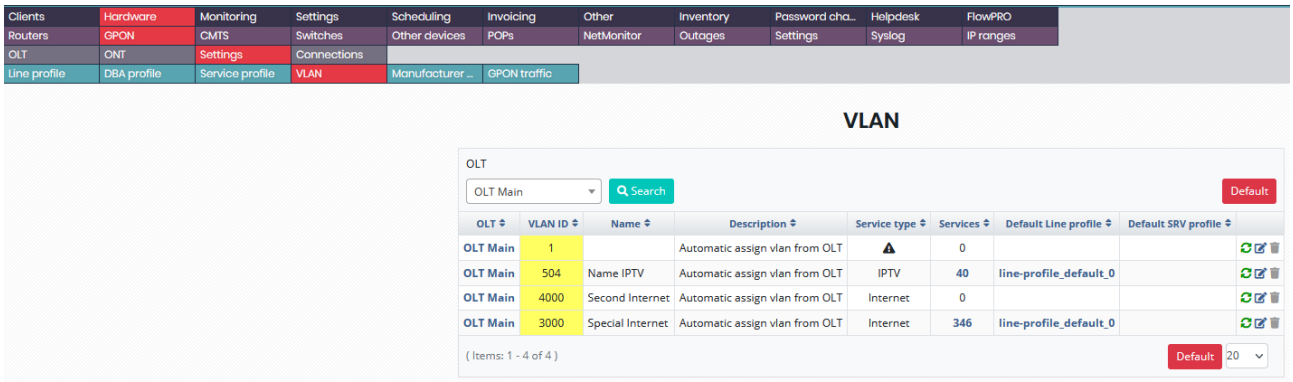
Each defined VLAN (used for services in ISPadmin) on the OLT must then be assigned to one type of service (Internet, IPTV).

This assignment will enable ISPadmin to process individual VLANs and services.

If the service type for the read VLAN is not defined, then ISPadmin will not process these VLANs, linked to existing services.

Each VLAN is assigned to a particular default assignment to line-profile and to srv-profile and they can be defined in the editing of the respective VLANs.

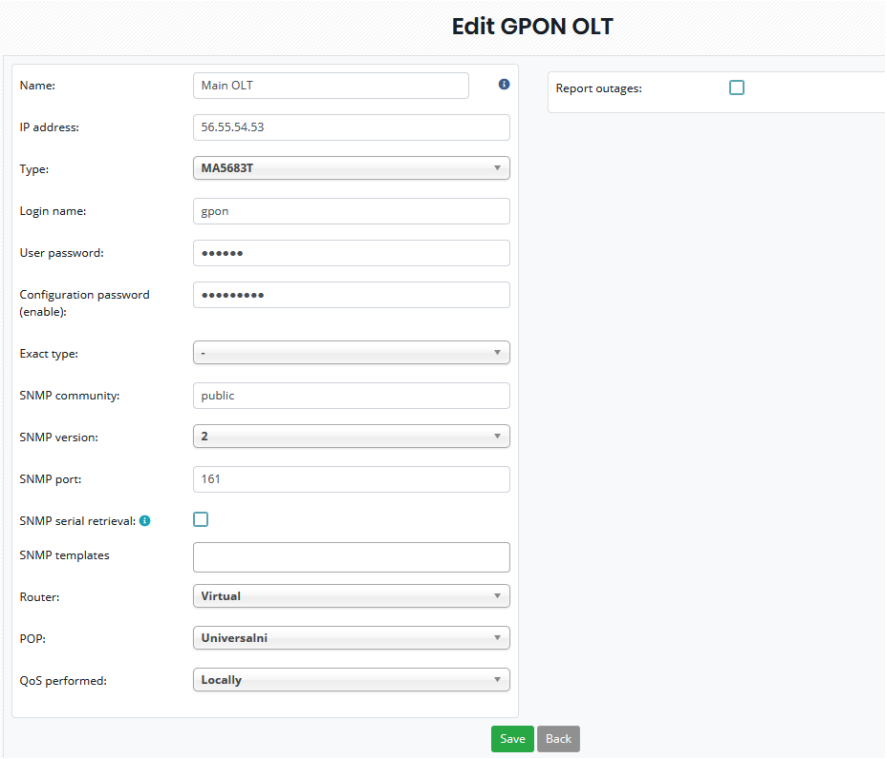
These default profiles are then used when creating the service so that the user has a minimum of work and knowledge when creating the GPON service at the client. It goes without saying that these profiles can be changed both during the creation of the service and during later editing.



Defining VLANs is individual for each OLT and accepts the already created model and structure of VLANs in the network.

2.3. Define OLTs

In section (**Hardware / GPON / OLT**) you can define a new OLT. Currently, only one type of OLT can be selected - **Huawei MA5600 series and above**. After filling in the name and password for telnet (mod enable) and community for SNMP communication in version 1 or 2c, the SNMP port, fill in the router that controls shaping and on which individual services are defined. If this router is set to "perform QoS on parent router", then QOS management is delegated to this parent router. You then define the QoS control mode in the "Perform QoS" field - see above. By default, you have the option to define options for POP and monitoring.

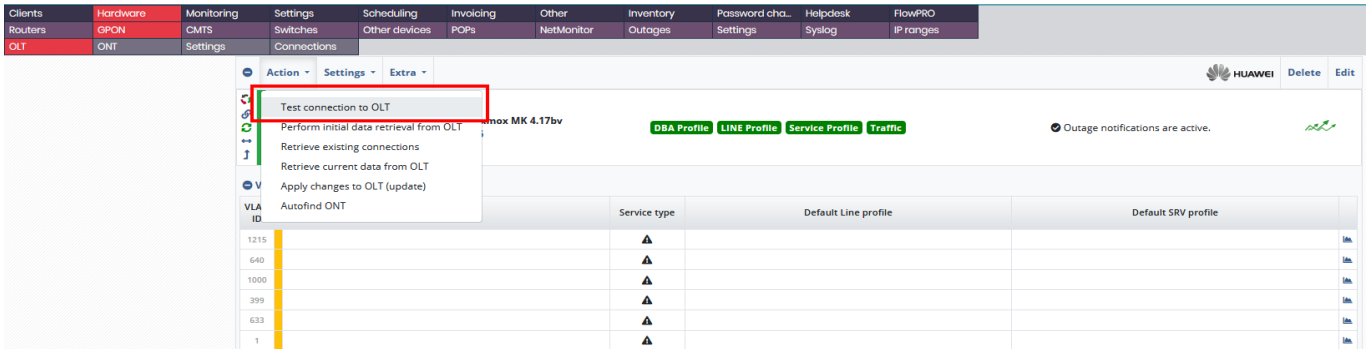


2.4. Initial data retrieval from OLT

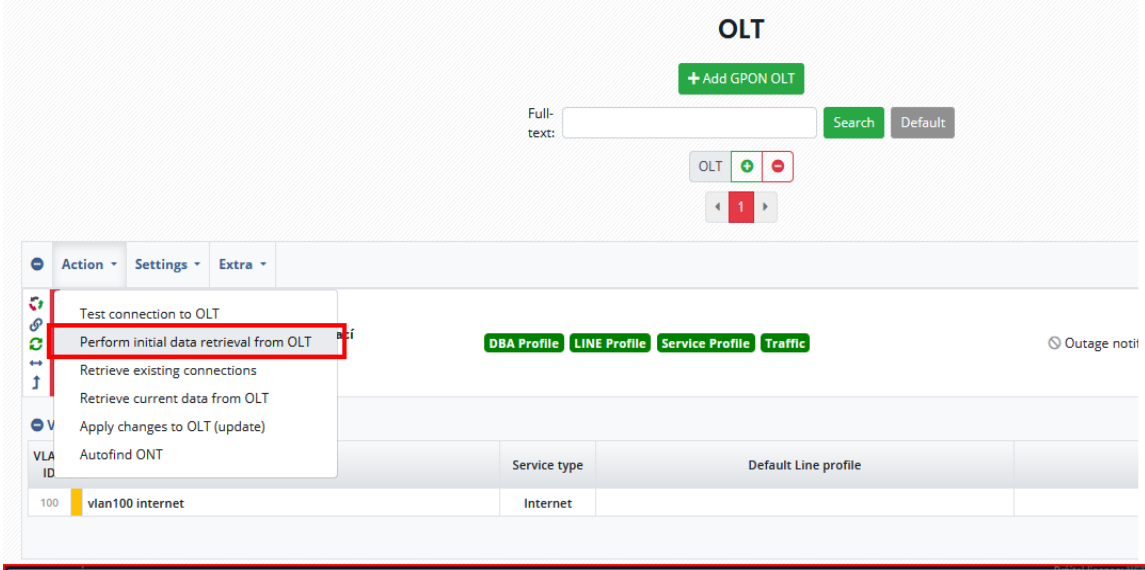
When a new OLT is created, it is necessary to retrieve all the settings and existing services to ISPadmin.

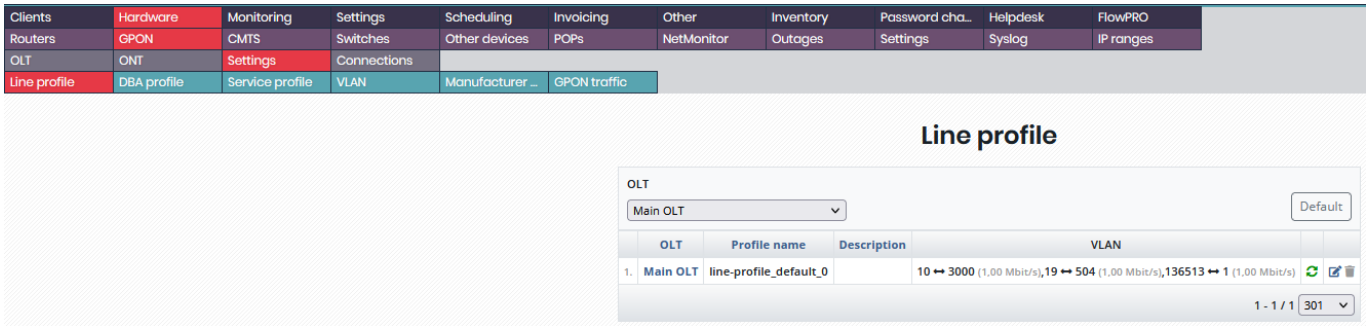
This process is crucial and ensures the full integration of the existing OLT into ISPadmin.

Therefore, check the correct access data settings via the **Test OLT connection** button or the connection test icon (🔗).

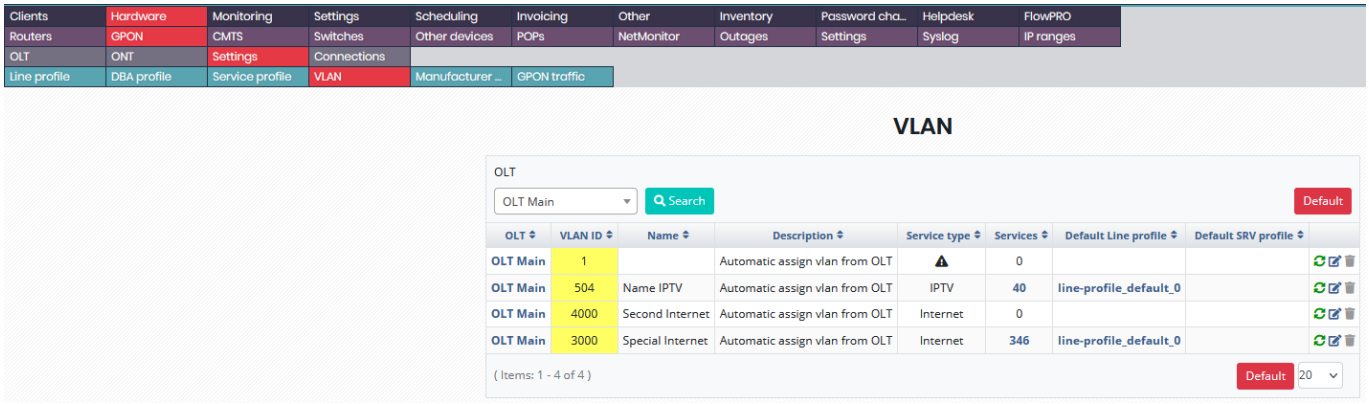


1. In the OLT Actions menu, select the option Perform initial loading of data from OLT. This will download all the settings and data from the OLT and they will already be displayed in (**Hardware / GPON / OLT**). There is an overview of read VLANs, all profiles (click link), slots, ports, etc. Click on e.g. When you click, for example, on Line Profile, you will be taken to the menu (**Hardware / GPON / Settings / Line Profile**) , where you can check whether the OLT settings are correct and also add your own description. The Data retrieval icon appears in all the rows and allows you to retrieve additional custom settings (Similar options are available across the GPON module). You can then limit the selection to specific OLTs by filtering.

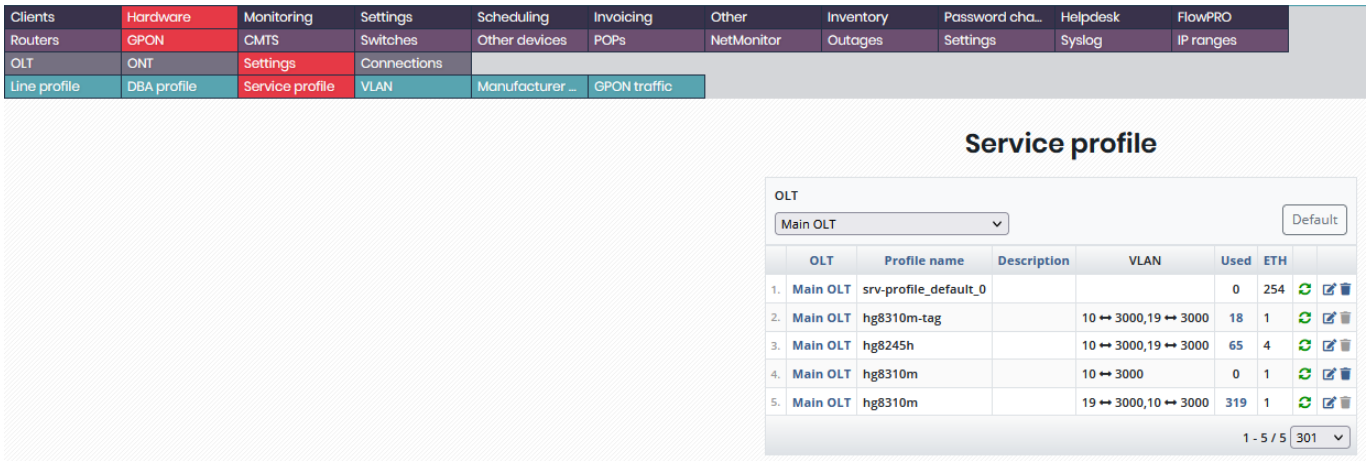




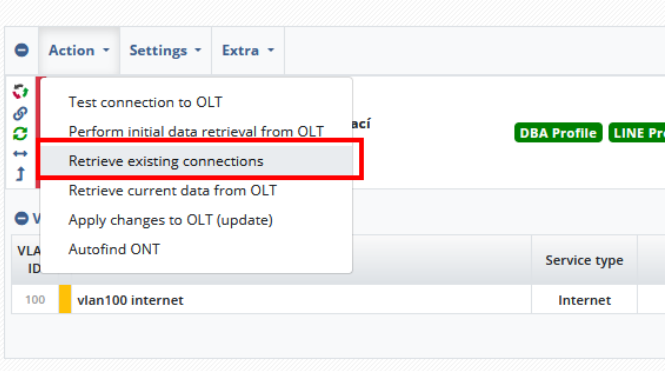
2. (**Hardware / GPON / Settings / VLAN**) it is necessary to assign a service type for the read VLANs (section 2.2 Defining VLANs).

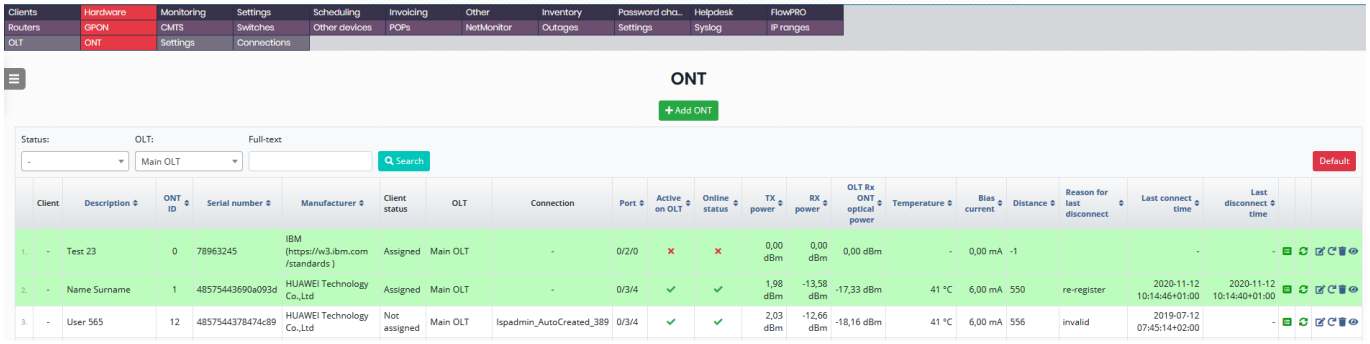


3. (**Hardware / GPON / Settings / Line Profile**) and (**Hardware / GPON / Settings / Service Profile**) both profiles need to be checked that they **contains the appropriate VLAN** (defined for Internet, IPTV)! Alternatively, map it manually.

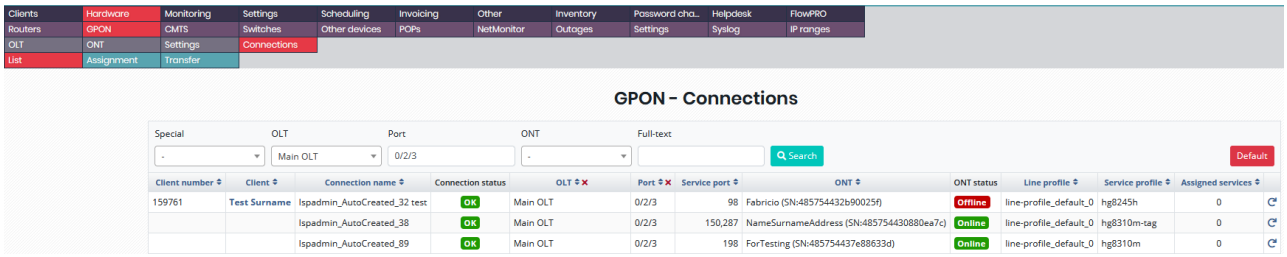


4. Now you can proceed to the next option (**Retrieve existing connections**). This option reads and tries to assign all existing service ports and defined ONTs on the OLT to existing clients based on the ONT description (description). A prerequisite for correct assignment is the existing description of the ONT on the OLT in the format ***Client_Number Surname Name, Installation address e.g.*** (***Ispadmin_9016140, John Walker, Street 123/4***). Since ONT naming is an individual matter and each provider has different habits, it will be necessary to contact ISPadmin support to adapt the automatic pairing technique. However, manual assignment to a client also works, but with more connections, this activity could lead to psychological damage.
In the menu (**Hardware / GPON / ONT**) you can see the read ONTs on the OLT and their detailed parameters.

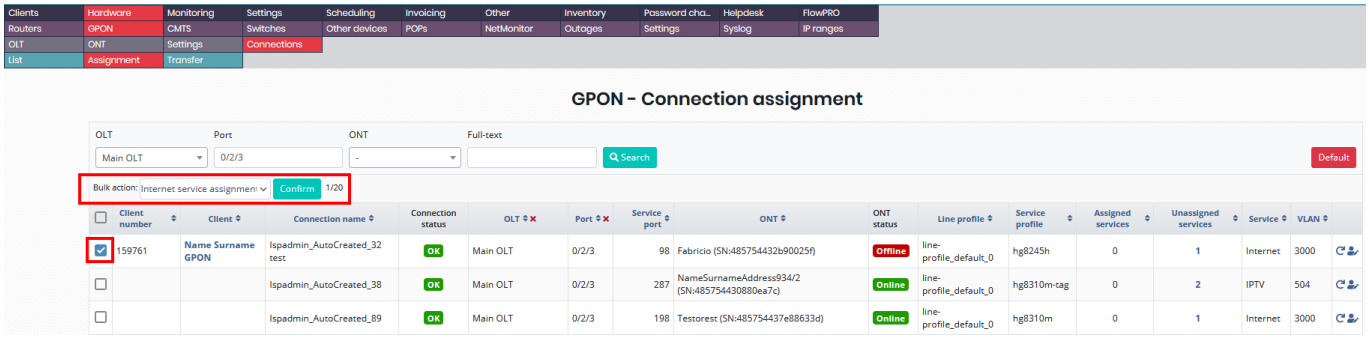




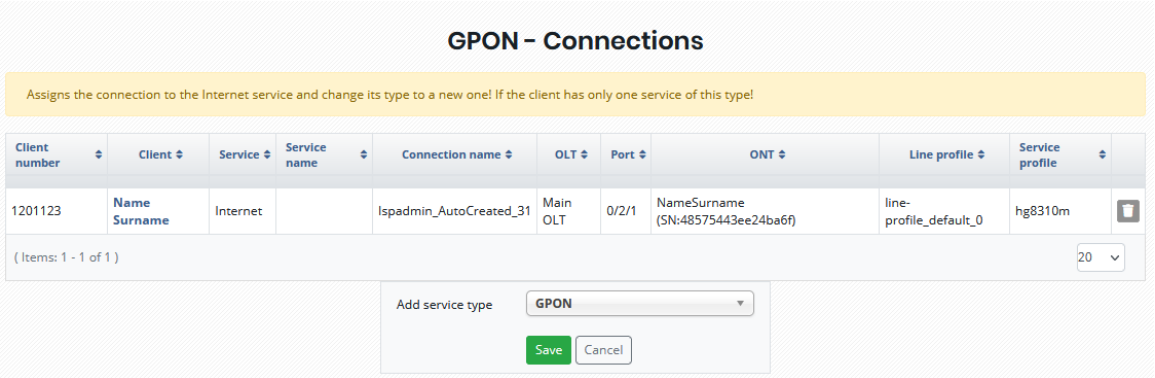
You can then find the read out and possibly paired connections in the menu (**Hardware / GPON / Connections**). The connections created by ISPadmin are registered in the List . Each connection has an ONT and a corresponding service port.
If it does not have a defined client in the column, then the created connection was not paired with a specific client.
This can be caused by the already mentioned inefficient auto-pairing technique, or a poorly defined VLAN and its assignment to a service type, or not at all! (you can perform the **Retrieve existing connections** method of automatically assigning connections to clients repeatedly after additional VLAN setup/refinement).



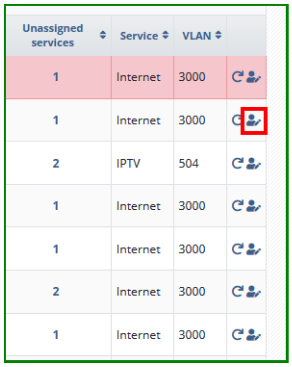
5. In the menu (**Hardware / GPON / Connections / Assignment**) then you can collectively assign a service for those connections that have their own client, which must already be created in the client's system and is of type Internet or possibly IPTV (if an IPTV type VLAN is found). The limitation for such an assignment is that there must be exactly one Internet or IPTV service at the client. Otherwise, the system could not automatically select this service and assign it to the found service on the OLT. However, if this condition is met, you can collectively assign all (or most) services defined on the OLT to existing services and thus convert these services to GPON services defined on a specific connection in one go. This will significantly simplify and speed up the entire process of GPON integration into ISPadmin.

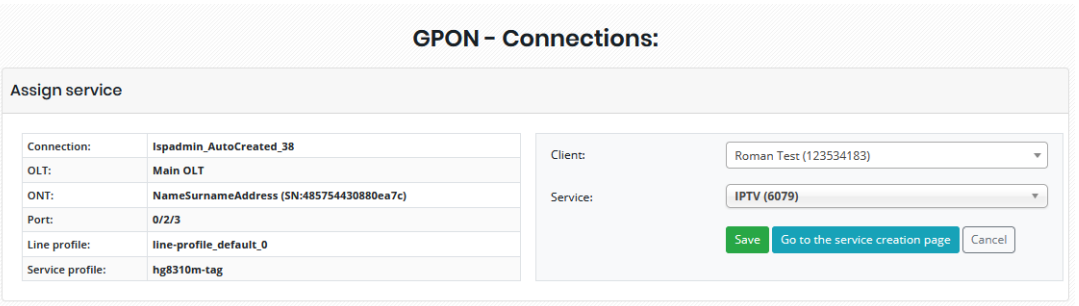


6. By defining the service type and saving, you assign all selected GPON services to the Internet service.



7. An individual service can also be assigned manually by clicking on the stick figure icon and selecting the client (enter the first letters of the name), selecting the original service (only non-GPON services) at the client and defining the type of the newly transformed service. Alternatively come to create a new service for this connection.





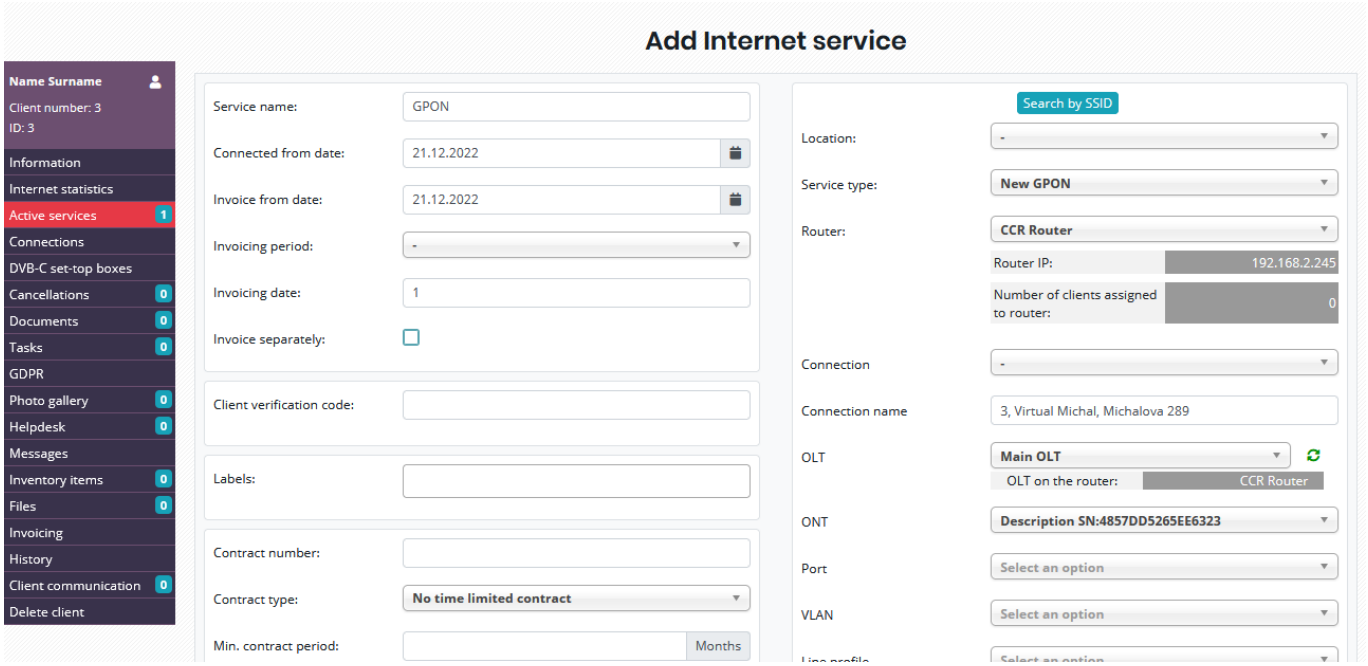
3. GPON service management

3.1. Add Internet service

The process of adding an Internet or IPTV service is almost the same as in the case of a standard service, for example - WiFi. It is only supplemented with a connection definition section (if the previous service definition has not already been created - in that case, only the existing connection is selected). After choosing the type of GPON service and choosing the router that will manage the service, you will proceed to define the connection.

- You can choose an existing connection
- Or you can specify a new one connection. And choose your own name as the name of the new connection or use the pre-filled Name (Client number, client's full name, street + house number)
- You define the OLT by choosing from the select box and subsequently defined ONTs in the system
- Or update the 'autofind' function on the selected OLT and select the found ONT by the function
- If the system has previously found an ONT with the autofind function and you select it, the other options are determined by this ONT
- In case of selecting an ONT from the list of manually added ONTs to the system, you must specify the Frame/Slot/Port (F/S/P) on the given OLT
- The VLAN is determined automatically according to the selected port and the type of added service (Internet, IPTV)
- ***Note: You can define a default VLAN for a specific port (FSP) on the OLT - edit the port in the slot and port overview of the OLT (basic OLT overview)***
- By choosing the line and srv profile for a given connection, you determine the basic properties of the connection
- ***Note: You can set the selection of the default profile in the VLAN definition and default profile determination. Profiles are offered according to the selected VLAN***
- You can specify on which ports the selected VLAN will be native. Previous settings of native VLANs for already defined services on existing connections are accepted
- ***Note: Again, it is possible to use the default native port settings for a given VLAN***

- You select a tariff with which you determine the traffic-table assignment for individual download and upload directions
- ***Note: If no tariff is selected, the service on the OLT will not be speed controlled. In addition, the 'Perform QoS' setting applies to the OLT, which determines where speed control will be performed (see above)***
- All the other settings are identical to the Internet/IPTV service settings.



3.2. Editing services

For editing a service, the same applies as for adding a new one, with the difference that ISPadmin additionally checks and offers only those combinations of VLAN, line and srv profiles that are valid for the given OLT and connection. It may happen that on an already defined connection you have a designated ONT and an already defined srv and line profile that allows you to choose only one VLAN, or a combination of VLANs, then you have to use these VLANs or choose another srv and line profile, which of course already includes once the defined service and its VLAN. Or you can create a new profile (which better suits your needs) manually on the OLT.

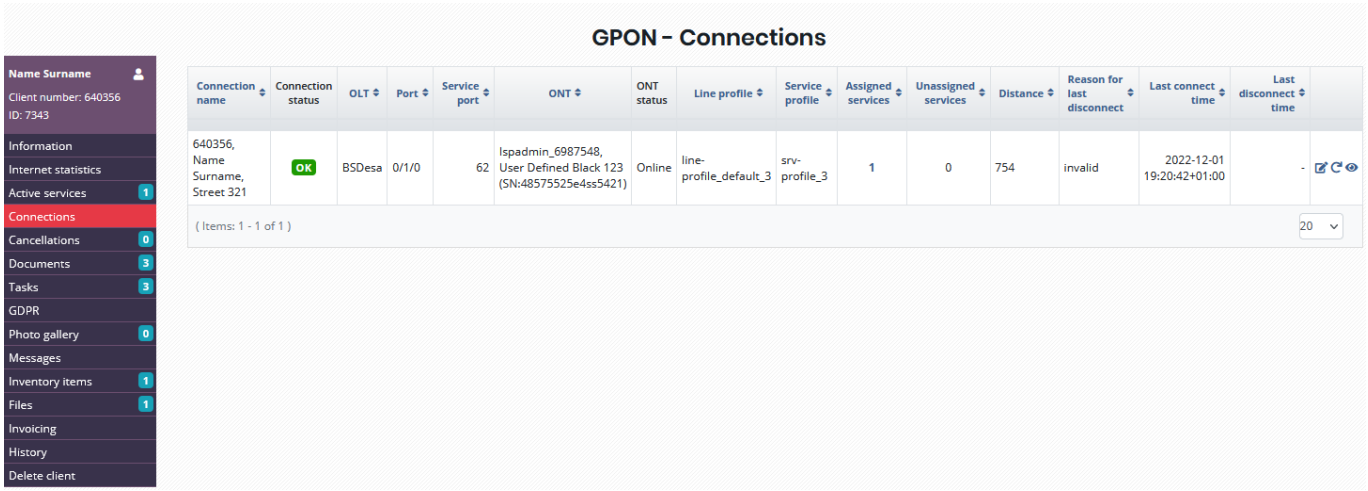
Note: ISPadmin does not manage the properties and settings of the dba, srv, line and traffic profile, but only takes over their properties and uses them in the settings of new and existing services! Any changes to the profiles must be made by the administrator directly on the OLT and must be part of the default state of the OLT.

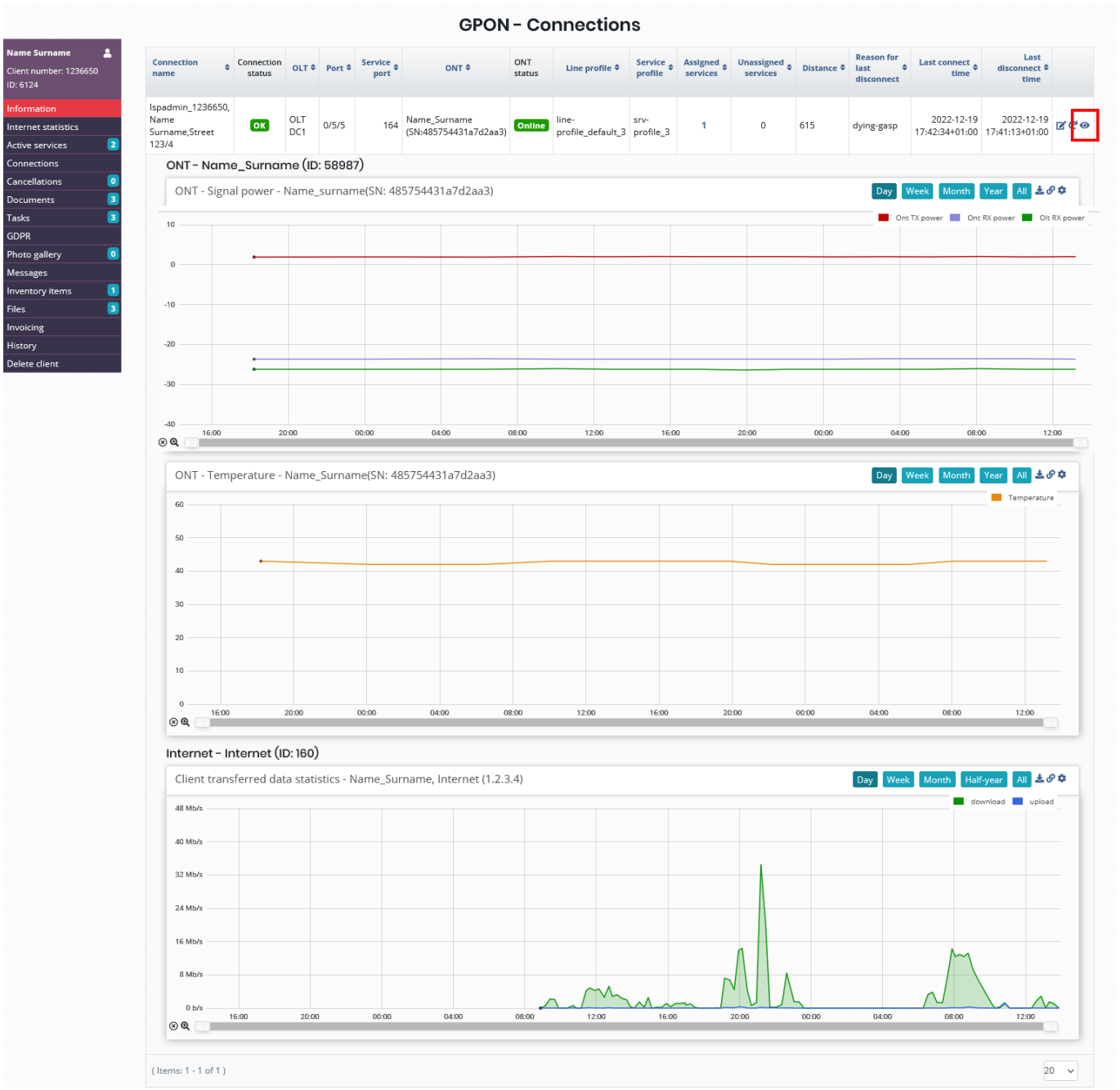
3.3. Connections

In the menu **Connections** in **Client card** (**Clients / Contacts**) you can view and edit the parameters of individual connections. Here you can also delete the existing connections that have already been created without associated services. This will definitely remove them from the OLT (the defined ONT is deleted from the OLT) and free them for further use in ISPadmin (it will remain in the ONT list under the current SN). The released and deleted ONT physically connected to the OLT will go into the list of so-called autofind ONTs that can be directly used to assign the service to a specific OLT port.

In connection editing, you can change the definition of srv and line profile and the definition of VLANs and native ports for a specific service.

Note: If you want to change the ONT for a given connection (replacement/defective ONT), you only need to choose either from those manually added to ISPadmin or choose the ONT found by the 'autofind' function (recommended).





3.4. Autofind

A very effective tool for working with GPON connections is the use of the autofind function. When an ONT is connected to a GPON network, the OLT detects a new device in the system. This device is then clearly determined by its connection to the optical fiber, to

which port and slot it is connected on the OLT. This eases the work of assigning a connection to the OLT and simplifies the operator's work when creating a service.

Another benefit of using the autofind function is when moving the connection to another port or to another OLT. The system will automatically detect that the given ONT has been moved to another port and if a connection and service is assigned to this ONT, it will be automatically moved within the same OLT. This ensures the automatic transfer of services if, for example, the operator needs to switch all connections to another fiber and on another port or slot of the existing OLT.

When moving to another OLT, you need to confirm the move to another OLT and thus complete the move itself. The form in the menu (**Hardware / GPON / Connections / Transfer**) , is intended for this, where you select the corresponding assigned profiles on the new OLT and perform the transfer. All operations are performed in the background in regular 5-minute cycles. Therefore, it is necessary to wait for the execution of the change, or to invoke it with the update button at the OLT. (You can check the change in the backups of the OLT, which is done after successful registration in the OLT).

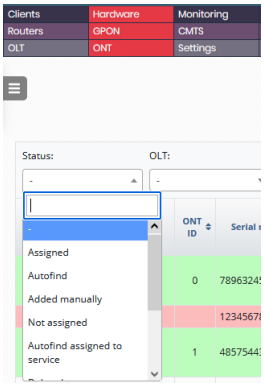
3.5. ONT

In ISPadmin, you can register all ONTs that are used to define the connection to the OLT, but also those that are still waiting to be used and are 'just stocked' and registered in the system. You can find this overview in the menu (**Hardware / GPON / ONT**) . For the active ONT on the OLT, the system then displays the main technical data of the quality of the connection to the optical fiber, the time of bringing it online and offline, and the reason for disconnection from the network. In addition to the important SN (serial number), the port assignment (FSP), OLT ID, and client assignment data are also listed.

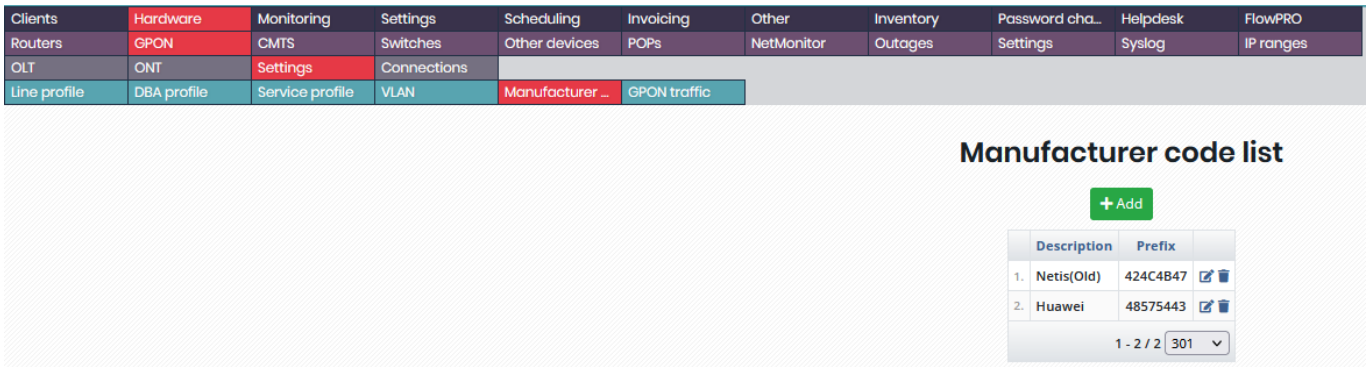
The **Status** column then indicates the current connection with ISPadmin:

- **Assigned** – The ONT is managet by the system and is assigned to a connection and service at the client.
- **Autofind** – The ONT is connected to the OLT and is not integrated into the OLT - it is in a waiting state.
- **Added manually** – The ONT is in the system and is not used anywhere (it is only stored).

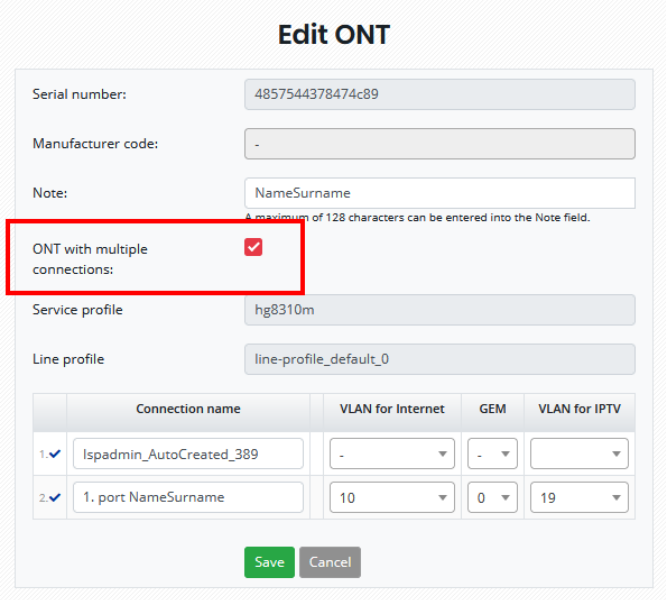
- **Unassigned** – The ONT is integrated in OLT but it is not assigned to any client and service.
- **Transfer to another port in progress** - this status means a state where the system is waiting for the transfer to be completed either on the operator's side via the menu (**Hardware / GPON / Connections / Transfer**) or ISPadmin in the background by the OLT update process.



ONTs that are not currently active can also be record in the system. To simplify the entry of serial numbers when inserting new ONTs, a list of manufacturers is available that you can fill in according to your needs in the menu (**Hardware / GPON / Settings / Manufacturer code list**).

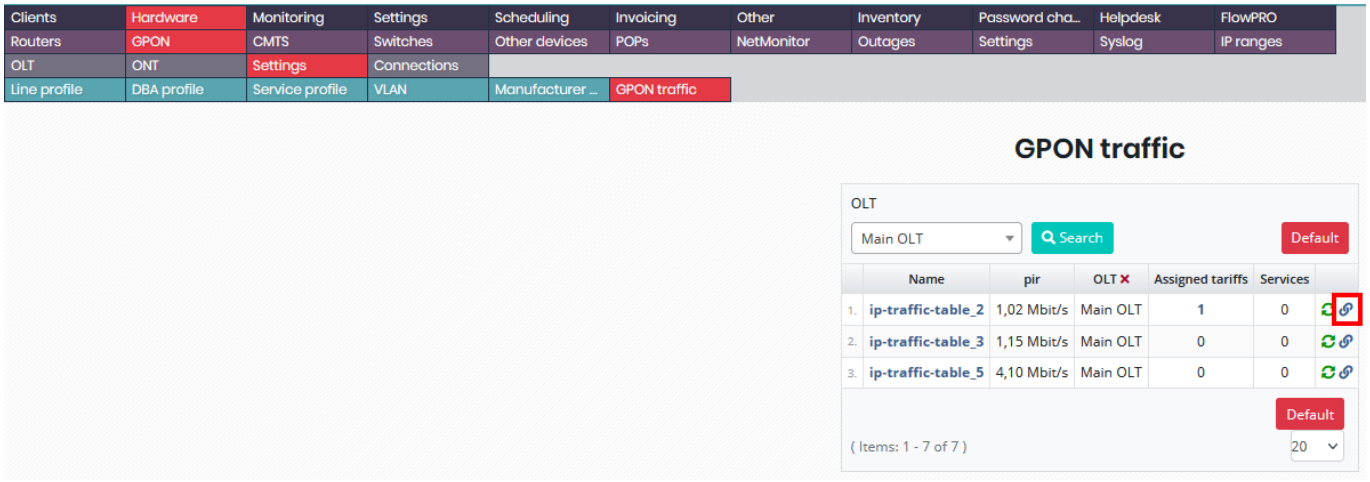


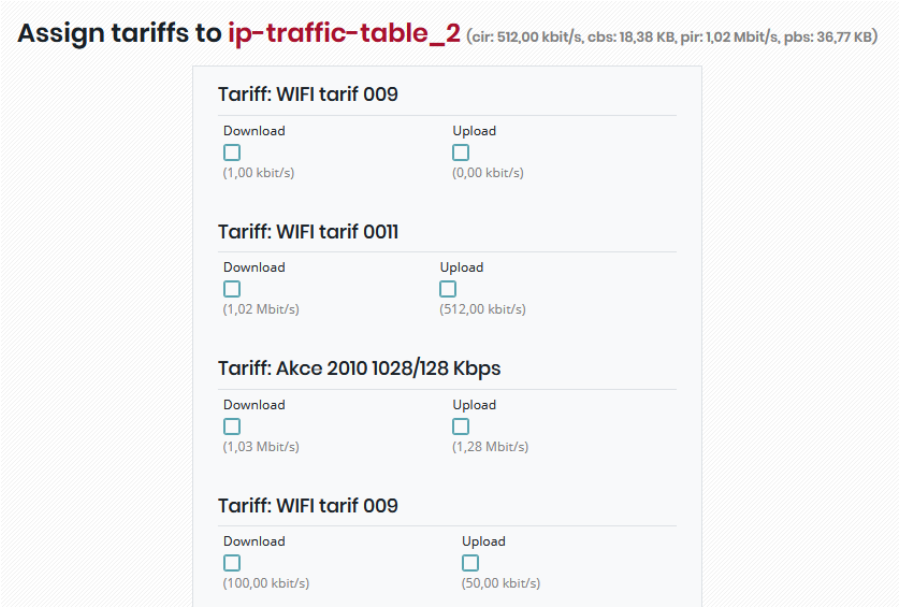
- **MDU (Multi Dwelling Unit) connections**
  - by default, ISPadmin creates only one connection for the ONT. It is possible to create more of them (e.g. for the needs of an apartment building). Such connections then remain in the system and are not permanently bound to the client (if they are removed from the client, they are released and can be assigned to another client). And in editing/adding a service, the entire connection is selected.
  - Creation requires an already properly configured ONT connected to the respective OLT. In the ONT editing, there is an option **ONT with multiple connections:** When it is possible to choose for individual ONT ports, which gem to use on the port and according to which VLANs are offered for the types of internet and iptv services. After saving, connections are automatically created without clients and services. These can then be selected when creating GPON services.
  - When adding an ONT, the option **Initialize MDU connections:** can be selected. Select the Olt and the appropriate profiles (which MDU supports) and start the initialization. The ONT will be written to the OLT with the relevant profiles and the data will be read back to ISPadmin. The connections then need to be set in the same way as in the previous point.



3.6. GPON Traffic-table

In the menu (**Hardware / GPON / Settings / GPON traffic**) gives you an overview of what traffic-table speed profiles are defined in individual OLTs. In addition to basic speed data and an overview of traffic usage for individual tariffs, you can edit and assign individual traffic_tables to individual tariffs (the condition is that the tariff has been added for use by the GPON module).

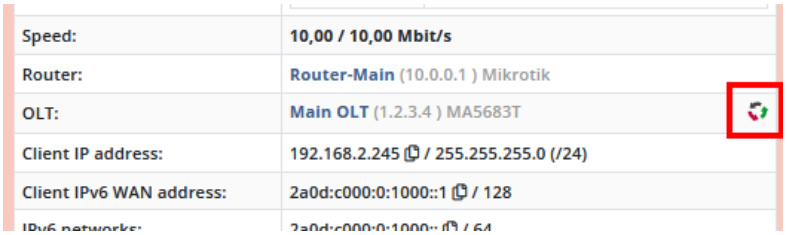




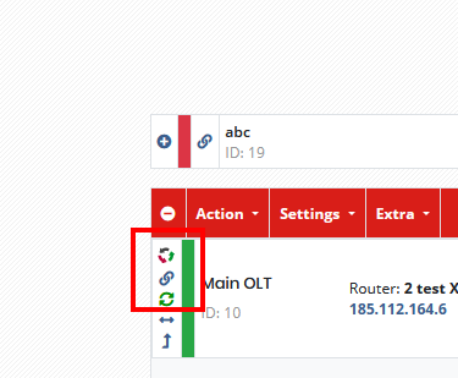
3.7. Backend

Service updates and the adding, deleting and editing processes run in the background of the ISPadmin system. When adding/editing a service, it is recorded on the OLT immediately.

Of course, it is also possible to invoke this update process from the web environment immediately by clicking on the already well-known update icon and then follow the actual update progress in the modal window.



Part of the trio of icons allows you to initiate the immediate retrieval of all data from a given OLT.



This icon is then also used in other sections of the GPON module and allows you to load a specific property where it is used.

During the process of adapting the existing configuration to ISPadmin, the existing settings on the OLT will not be affected in any way.

After completing the assignment of the connection and the corresponding service port to the existing service in ISPadmin, the setting in the OLT is fully under the control of

ISPadmin and will be influenced by the status defined by ISPadmin (request to change the connection, add and delete the service, delete the connection, etc.).

The setting of VLAN, individual profiles, various system values is not influenced by ISPadmin and the OLT operator has to manage it himself. From the description above, ISPadmin uses profiles based on defined VLANs to create line and srv services. Priority-based profiles are not supported for creating services.

However, ISPadmin can use them to adapt existing ONTs and services to ISPadmin. However, it is necessary that you use 'manual' VLAN mapping for such a profile when editing such a profile (which VLAN is used for the user-vlan to the corresponding VLAN to the Internet).