# NetUP.tv.
# User's manual

# Contents

# Introduction

## Intended audience

This manual is intended for IPTV service providers using NetUP solutions. An overall knowledge of TV broadcasting systems and IP networking is assumed. The document covers basic functionality of NetUP.tv, as well as the typical necessary actions during its startup, deployment, and operation.

## Notation conventions

```
Code blocks;
```

*Notes*

*Warnings related to incomplete compatibility with older versions of NetUP.tv NetUP.tv*

*Generic warnings*

# System Components

## Bundling options

The NetUP.tv system can include the following components:

- **Streamer** – server for receiving and broadcasting a stream;
- **MultiMedia Processor (transcoder)** – server for stream processing;
- **Middleware (MW)** – system for communication of content sources with customer equipment;
- **Billing** – system for managing customers, tariffs, services;
- **VoD system** for storing VoD content;
- **CatchUP system** for storing TV content;
- **CDN system** for distributing unicast streams;
- **CAS / DRM system** to encrypt and protect the stream from unauthorized viewing;
- **Equipment and applications for customers** – set-top boxes and NetUP.tv client, NetUP WEB client to view content in the browser, NetUP mobile – the application for phones and tablets, NetUP SmartTV – the application for smart TVs.

The NetUP.tv system can include one or more devices, depending on the required configuration. Each configuration has a corresponding firmware file. By the name of the file, you can identify the components that are included in the system, for example:

- **cdn** – CDN system;
- **vod** – VOD system;
- **dvb-gw** – dvb-gw, transcoder, web_interface;
- **dvb-gw-standalone** – cluster_core, dvb-gw, transcoder, web_interface;
- **mw+billing** – cluster_core, billing, middleware, vod_balancer, web_interface;
- **complex** – cluster_core, billing, middleware, vod, vod_balancer, web_interface;
- **combine** – cluster_core, billing, middleware, vod, vod_balancer, dvb-gw, transcoder, web_interface;
- **combine+hotel-web-portal** – cluster_core, billing, vod_balancer, middleware, vod, dvb-gw, transcoder, web_interface, hotel_web_portal;
- **combine-wo-vod** – cluster_core, billing, middleware, vod_balancer, dvb-gw, transcoder, web_interface.

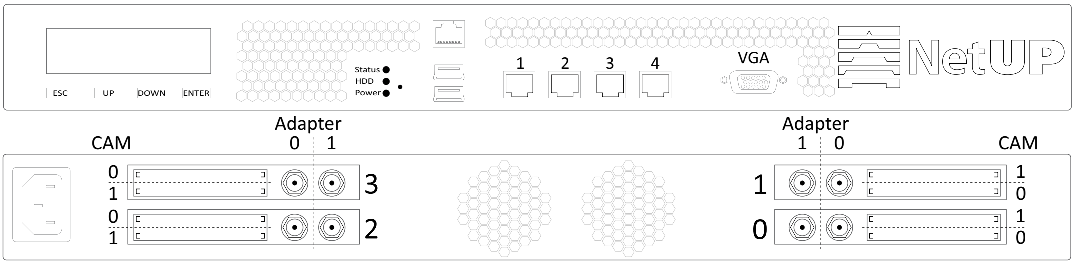
Devices with **cluster_core** can be considered as stand-alone system. Each of the systems can be supplemented with an arbitrary number of separate VoD, CatchUP and DRM servers and streamers.

**NetUP IPTV Combine** is an universal device that combines required components for a quick start. It includes:

- headend to receive digital satellite, terrestrial, cable signals and retransmit over 200 channels to a local network or the Internet;
- Middleware system and billing that help to manage the customers base and commercial services;
- VoD system with storage for content.

NetUP IPTV Combine is available in three models: IPTV Combine mini, IPTV Combine 8x and IPTV Combine 16x. First of all, these devices differ from each other in the number of inputs, outputs and CAM-modules.

For example, **NetUP IPTV Combine 8x** has 4-Port Gigabit Ethernet 10/100/1000 on the front panel, 8-slot CAM (Common Interface) and 8 universal DVB-S2/T2/C2 inputs on the rear panel:



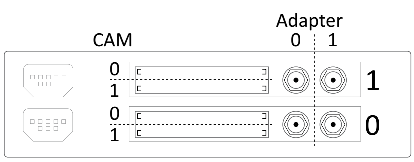

> *Note also that a pair of CAM slots is located in a single orifice. CAM modules must be placed into the slots in the following orientation: the front side (with the manufacturer's logo) is facing down for the slots on the right side of the device and the front side is facing up for the slots on the left side. In the IPTV Combine 16x device, all CAM modules must be placed face down.*

You can learn more details about each NetUP IPTV Combine model from your NetUP manager.

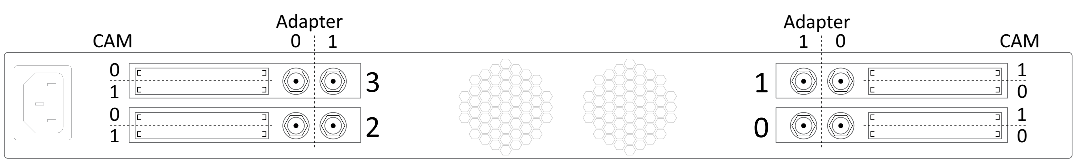
## Streamer

The streamer allows to receive satellite, terrestrial or cable signal in various formats – DVB-S/DVB-S2, DVB-T/DVB-T2, DVB-C, ATSC, ISDB-T. This device combines the receiver function and IP-streamer function and can be used as a stand-alone system.

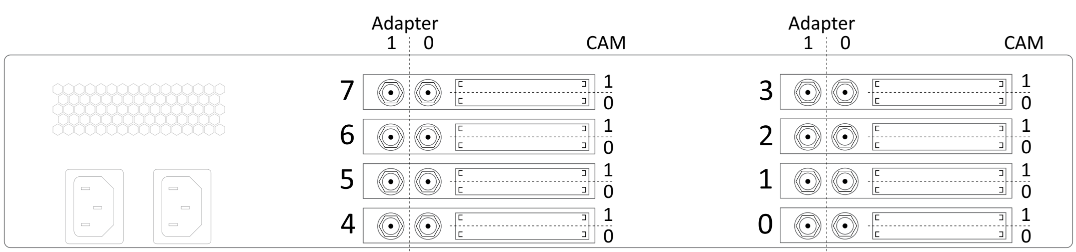
Depending on the model, the streamer can support 4 to 16 inputs and CAM modules:




NetUP Streamer mini




NetUP Streamer 8x




NetUP Streamer 16x

# MultiMedia Processor (transcoder)

NetUP MultiMedia Processor (transcoder) is a professional software solution for encoding and transcoding video streams in real time. The device supports the following formats:

| | Input stream | Output stream |
|---|---|---|
| **Protocols:** | UDP, HLS, DASH, HTTP progressive, RTP, RTSP | UDP, RTMP publish, HTTP, HLS, DASH |
| **Formats:** | MPEG-TS, MP4 | MPEG-TS, MP4 |
| **Audio Codecs:** | AAC, MP2, MP3, AC-3 | AAC, MP2, MP3 |
| **Video Codecs:** | MPEG-2 (H.222/H262) to 1920x1080@60p; AVC (H.264) to1920x1080@60p; HEVC (H.265) | MPEG-2 (H.222/H262) to 1920x1080@60p; AVC (H.264) to 1920x1080@60p; HEVC (H.265) |

**You can use following video codec profiles for processing input streams:**

- MPEG-2 (H.222/H262) – baseline, main, high;
- AVC (H.264) – baseline, main, high;
- HEVC (H.265) – main.

The processing settings for video streams see in **Manager web interface: Video stream processing** on page **72**.

# Middleware (MW)

User interface of the Middleware system supports the following services:

- watching TV channels;
- listening to radio;
- Video on Demand (VoD);
- watching catch-up TV (CatchUP);
- Time-Shifted TV;
- Electronic Program Guide (EPG).

Middleware by NetAP supports Android set-top boxes.

*The server with Middleware and billing must be enabled 24 hours a day. Low priority tasks are scheduled to be executed at night*

For more info about the service management interface, see **Web interface: Media content** on page **42**.

# Billing

The billing system performs the following functions:

- customer database maintenance;
- tariffing of services;
- creation and management of service plans;
- access cards management.

The billing system can be integrated with any third-party system controlling services of other types, like Internet access, VoIP, etc.

For more info about the billing interface, see **Manager web interface** on page **58**.

## VoD system

The VoD system can be integrated into universal and headend devices by NetUP or can be ordered and delivered separately. The purpose of the system is to store content and provide a "video on demand" service.

It is possible to connect additional storage systems (Data Storage). Video content can be loaded via `ftp`.

## CatchUP system

The CatchUP system can be integrated into universal and headend devices by NetUP or can be ordered and delivered separately. The purpose of the system is to organize an interactive TV and provide CatchUP TV service and Time-Shifted TV service.

## CDN system

The CDN system is a part of NetUP OTT solution. The purpose of the system is to optimize content delivery and decrease content source load (Streamer, Transcoder, VoD).

## Equipment and applications for customers

The system NetUP.tv can be supplemented with **NetUP Android IP STBs.** These universal devices help customers to access all IPTV services. The NetUP Android IP STB can be used as a media center and a Wi-Fi router. For more info, see **NetUP.tv Android client** on page **79**. If necessary, the system can be integrated with set-top boxes from other manufacturers.

Owners of smart TVs Samsung (Tizen), LG (WebOS), Sony and Philips (Android TV) can use the **NetUP Smart TV** application instead of a set-top box. This application copies functionality of STB. Users can watch live TV, past broadcasts, use VoD, browse program guide and get access to their personal account. For more info, see **NetUP SmartTV** on page **90**

The NetUP offers **NetUP mobile** for watching content on phones and tablets and **NetUP WEB** for watching content using any browser. The NetUP WEB supports user authorization, watching TV channels and films, access to a personal account and so on. For more info, see **NetUP mobile** on page **96** and **NetUP WEB** on page **93**

# Basic objects and processes

## Preset

A preset is a saved set of settings which can be used to set up input signals and output streams. You can save the current settings into a preset in a web interface.

The preset helps you to fill in web interface forms quickly while you are setting up any of the available NetUP Streamer inputs. The preset can store input and streaming settings, or only the input settings. Input and streaming settings from the same preset must be downloaded separately.

*Processing presets must be created separately (for more info, see **Manager web interface: Processing presets** on page **72**)*

See more:

- **Web interface: Input settings** on page **37**
- **Usage examples: Create and edit a preset** on page **15**
- **Usage examples: Set up streaming** on page **16**

## Media content

A media content is a system object containing a record of some multimedia data source, which may be a file or a stream.

In the NetUP.tv system, media content is divided into three types: **Radio, TV channels, Movies**. You can create **Media groups** for each of media content types and use these groups to combine content. You can also include a separate media content or a media group in the appropriate type of service.

See more:

- **Web interface: Media content** on page **42**
- **Manager web interface: Media content groups** on page **65**
- **Usage examples: Add a TV channel** on page **18**
- **Usage examples: Create a VOD content (a video, a movie)** on page **20**

## Services

Service is a system object containing a record of cost and billing terms.

In the NetUP.tv system, services are divided into following types:

- **Basic services (Periodic, One-time)** are general services which can be attached to a customer as a separate service and as a part of a service plan.
- **IPTV (TV channels, TV channels in record, Movies, Radio)** provide access to individual units or groups of content of the corresponding type and can be attached only as part of the service plan.

**Service plan services** are automatically activated for a customer when you attach a service plan to the customer. **IPTV services** with the *Additional service flag* cannot be activated automatically. A customer can enable these IPTV services via the STB interface or the application. A customer can select and enable the services included to customer's service plan. The administrator of NetUP.tv system can switch the Additional service flag during the creation or editing of the service
**Standalone services** can be attached to a customer only by the administrator of NetUP.tv system via the web interface.

See more:

- **Manager web interface: Service plan page** on page **64**
- **Manager web interface: Standalone services** on page **65**
- **Usage examples: Create a standalone service** on page **24**

## Service parameters

Creating a service, you can set following parameters:

- **Blockable** – it determines if the service is still provided and charged for, when the customer's personal account is blocked;
- **Additional service** – it determines whether the service will be attached automatically when the service plan is attached to the customer;
- **Is automatically activated more than once** – it determines how many times the service will be attached and charged for.

## Service price and currency

When creating a service, you can set a service price and currency. Customers can be charged monthly or daily for periodic service.

You can change the price of the service, but if this service has already been attached to some customers, the subsequent service fee will be recalculated for these customers (for more info, see the section below).

## Charge details

For all the services, except for **One-time** and **Movies** types, the **Prepayment for** parameter is available. This parameter determines the moment when to charge a customer for service usage. You can choose one of the following values:

- **Accounting period** – after service attachment, the customer is charged till the end of month, and then is charged for the next month at the beginning of every month;
- **Day** – after service attachment, the customer is charged till the end of day, and then is charged for the next day at the beginning of every day;
- **Month** – after service attachment, the customer is charged for one month, and then is charged for the next month at the same day of every month.

For **One-time** and **Movies** services, the actual charge-off occurs at the moment of service attachment.

*In fact, the actual charge-off is not made at the precise moment of service attachment or at the end of period but on the nearest general tariff event after that. This event repeats every hour*

Charging may be affected by:

- **blocking of customer's account** – if the **Blockable** flag is on, the service is not charged;
- **changing the service price** – if you change the price of a periodic service that is already attached to the customer, the cost will be recalculated using the new price for the whole period of the service, including past periods. The recalculation will occur at the end of the accounting period. If the service price is increased, an extra charge will be made. If the service price is reduced, the subsequent service fee will be reduced. You can change the service price if it has been set erroneously from the very beginning. Otherwise, i.e. If you need to adjust the price at a certain moment, the service itself should be detached from all relevant users and replaced with the new one, providing the same content for a different price.

## Service cost

Periodic service cost is calculated as a product of the service price and the service period (the time when the service has been provided). Thus, the bill for the same service from month to month can be expressed in different amounts depending on the number of days in a month. For example:

- If the service price is defined *per day* and the 'Prepayment for' is set as *Accounting period* or *Month*, the service cost will be calculated considering the actual number of days in the given month and the full amount will charge monthly;

- If the service price is defined *per month* and the ‘Prepayment for’ is set as *Day*, the service cost will be calculated considering the actual number of days in the given month and the charge will occur every day.

## Service period

For all the services, except for **One-time** type, you can set the service period. Adding a service to a customer you can choose *Start and End date* of the service. For One-time services, you can only set the Start date.

If you don’t set the Start date, any of the services will be attached *immediately*. If you don’t set the End date, the service plan services, except for **Movies**, will be limited by the validity period of the service plan and other services will be detached after customer’s personal account will be blocked or closed, depending on service parameters (see **Service parameters** on page **11**). A **Movies** service can be attached for one day.

If the service period isn't completed, the service will be displayed on the customer’s personal account page. For such services, you can change the End date. If the service period is completed, the service will be displayed in the Attached services history (see **Manager web interface: Customer’s personal account page** on page **60**).

*Stand-alone one-time services that were be attached immediately aren’t displayed on the customer’s personal account page. They are displayed in the Attached services history*

## Content access

For **IPTV** services, the access to content is opened after the customer is charged for the service, and is valid during the period for which the customer has been charged.

The access may be discontinued prematurely in case if the customer’s account gets blocked.

# Service plans

A service plan is a set of services of various types. If a service is included in a service plan and the **Auto-enable** flag in this service is on, the service will be automatically attached to a customer after service plan attachment. Other service plan services are available for attachment.

See more:

- **Manager web interface: Service plans** on page **63**
- **Usage examples: Create a service plan** on page **22**

## Service plan parameters

Creating a service plan, you can choose the following parameters:

- **State** – it determines whether the service plan can be attached to customers (*Active* – it is possible; *Being edited, Obsolete* – it is not possible);
- **Groups** – it determines customer groups which can attach the service plan via the interface of the STB or the application.

*The customer can choose a service plan that is included to the same group as their current service plan. Service plan switching will occur at the end of the accounting period.*
*The administrator of the NetUP.tv system can choose any of the service plans to attach it to the customer. Service plan switching via the web interface can occur immediately or on a specified date.*

# Customers

A customer is a system object containing record of an end user of the NetUP.tv services. In the hotel solution a customer actually refers not to a specific real-world person, but rather to a particular hotel room and a sequence of guests staying in it.

In the NetUP.tv system, customers are divided into two types: **Individual** and **Organization.** Depending on the type of customers, the system stores different information about them.

If you need to start working with a customer, you must create a personal account for this customer (see **Personal accounts** on page **13**).

See more:

- **Manager web interface: Customers** on page **59**
- **Customer information page** on page **62**
- **Customer's personal account page** on page **60**
- **Usage examples: Create a customer and a customer's personal account** on page **24**

## Personal accounts

Each customer can have one or several personal accounts, for example, to be able to connect several set-top boxes. Service plans and services are not attached to a customer, they are attached to a customer personal account.

The personal account can be blocked by the administrator on the personal account page (**Manual blocking**) or by the system due to low balance (**Automatic blocking**). Automatic blocking persists until terminated by the system, which happens once the account balance (considering the *credit*) becomes positive. Manual blocking can be removed manually by the administrator.

*If the personal account is blocked, the services which have the Blockable flag are not charged (see **Charge details** on page **11**)*

## Access card and activation codes

An access card, PIN and license key are required to activate the STB. They are generated automatically after creating a personal account for the customer. You can see the information about the access card or generate new activation code (PIN) on the personal account page of the customer via the web interface.

See more:

- **Manager web interface: Customer's personal account page** on page **60**
- **Usage examples: Generate an activation code for an access card** on page **25**

## Customer groups

You can combine customers into groups. You can add a customer to a group when you are creating the customer or editing customer data. One customer can be in several groups at the same time.

Moreover, customer groups can be used to combine service plans. The customer can choose one of the service plans from the group which includes their current service plan and switch the service plan on their own.

See more:

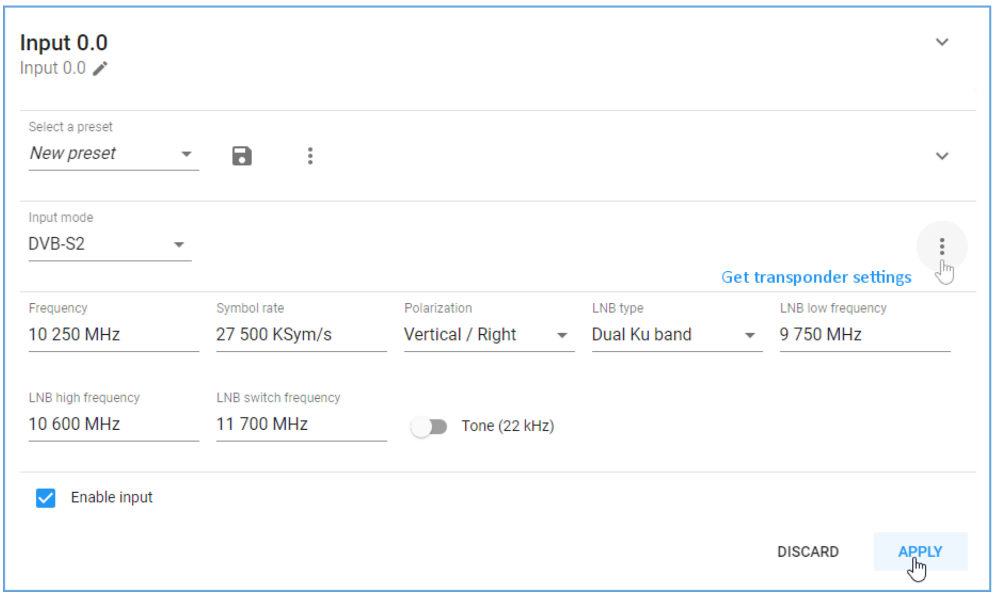
- **Manager web interface: Customer groups** on page **63**
- **Usage examples: Create a customer and a customer's personal account** on page **24**

# Usage examples

## Configure an input

*See the description of web interface pages here:* ***Web interface: DVB to IP gateway*** *on page* ***34*** *and* ***Input settings*** *on page* ***37***

1. Open the **DVB to IP gateway** page (the **Streaming** group) in the web interface.
2. Click **Expand input** on an input panel. If the input signal is not configured or turned off, the expanded panel displays only adapter settings. If the input signal is enabled, click **Expand input settings** to show the adapter settings panel.




3. Set the input parameters in one of the following ways:
   - **manually** – select **Input mode** (DVB-S, DVB-S2, DVB-T, DVB-T2, DVB-C Annex A, ISDB-T) and fill in all the parameters. Each of Input modes has its own set of parameters, and the list of available modes depends on the DVB adapter type. For more info, see **Web interface: Input modes** on page **39**
   - **get settings from satellite database or browse network** – click **Get transponder settings** button on the right and select the option: **Satellite database** or **Browse network.** In the opened window select one of the available transponders to fill in its parameters in the form

***Browse network*** *is available for DVB-S and DVB-S2*

   - **upload settings from preset** – click **Select a preset** and choose one from the list. The preset settings will be displayed in the form. If necessary, you can change parameter values

*Changing parameter values in the web form does not affect the preset. For more info, see* ***Configure an input using a preset*** *on page* ***15***

4. Turn on the **Enable input** flag.
5. Click on **Apply** button to active the settings. As a result, the panel displays input signal quality indicators and the list of programs for the selected frequency.

> *If you use a preset to set up an input, click on **Apply** and choose one of the actions: **Apply input settings** or **Apply both input and streaming settings**, because the preset can store not only the parameters to configure the input, but also the parameters to configure output streams.*
> *If the preset stores only the parameters to configure the input, the panel displays the **Load** button*

## Create and edit a preset

> *See the description of web interface pages here: **Web interface: DVB to IP gateway** on page **34** and **Input settings** on page **37***

1. Open the **DVB to IP gateway** page (the **Streaming** group) in the web interface.
2. Click **Expand input** on an input panel and then click **Expand input settings**.
3. Select the **New preset** from the preset list.
4. Fill in the transponder parameters manually or by selecting from the available list (for more info, see **Configure an input** on page **14**), set up other input parameters and click on **Apply**. As a result, the panel displays input signal quality indicators and the list of programs for the selected frequency.
5. Set up streams and then save the preset. Parameters of all configured streams will be saved into the preset. For more info, see **Set up streaming** on page **16**

> *If you only need to save the input settings in the preset, skip this step*

6. Click on **Save preset**. In the opened window, write **Preset name** and click **Save**.
7. If you need to **edit a preset**, select the preset from the list, change settings for the input or the streaming or both, apply the changes and then click **Save preset**. In the opened window, you can save changes and rename the preset.

## Configure an input using a preset

> *See the description of web interface pages here: **Web interface: DVB to IP gateway** on page **34** and **Input settings** on page **37***

1. Open the **DVB to IP gateway** page (the **Streaming** group) in the web interface.
2. Click **Expand input** on an input panel. If the input signal is not configured or turned off, the expanded panel displays only adapter settings. If the input signal is enabled, click **Expand input settings** to show the adapter settings panel.
3. **Select a preset** from the list and the web form displays the parameters saved in the preset. If necessary, you can change parameter values.

> *Changing parameter values in the web form does not affect the preset. How to modify it, please see **Create and edit a preset** on page **15***

4. Click **Load** or **Apply => Apply input settings** to active the settings from the preset. As a result, the panel displays input signal quality indicators and the list of programs for the selected frequency.

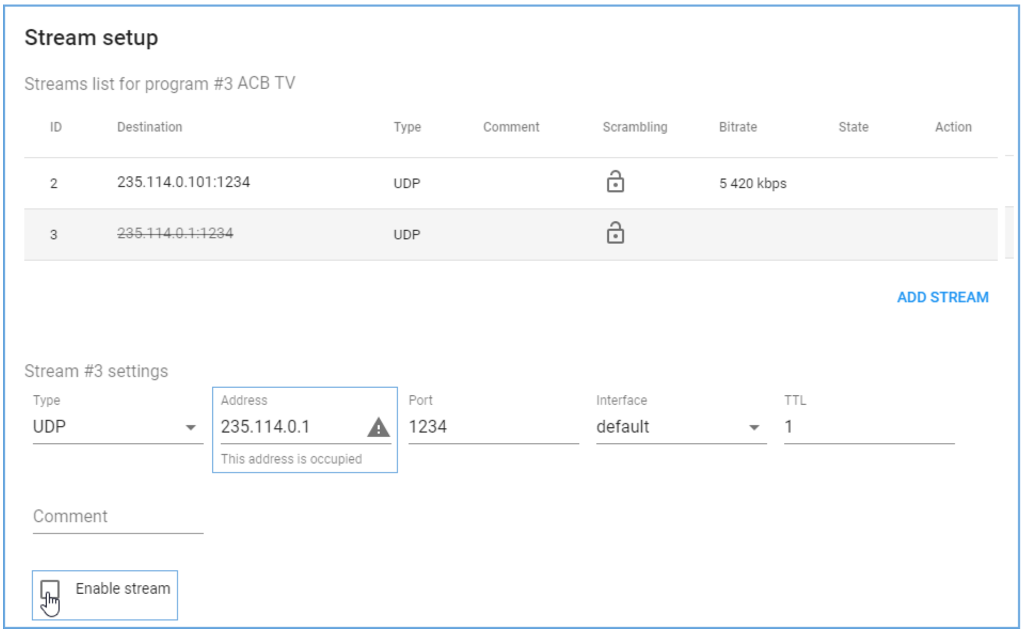
> *If a preset stores only input settings, the web form displays Load. If a preset stores input and streaming settings, the web form displays Apply*

> *Input settings and streaming settings from the same preset are downloaded separately*

5. Click **Apply => Apply input settings** and the bottom part of the panel will display the streams which were saved in the preset.

*When loading the streaming settings, the system compares addresses of the existing streams with stream addresses that need to be downloaded from the selected preset. If the system finds identical addresses, it will generate an error and stop broadcasting streams that were downloaded from the preset*

6. Check the stream addresses and change their settings or enable streams manually. To do it, open the Stream setup window, select a stopped stream, change its **Address**, then turn on the **Enable stream** flag and click on Apply button.




*For more info, see* ***Set up streaming*** *on page* ***16***

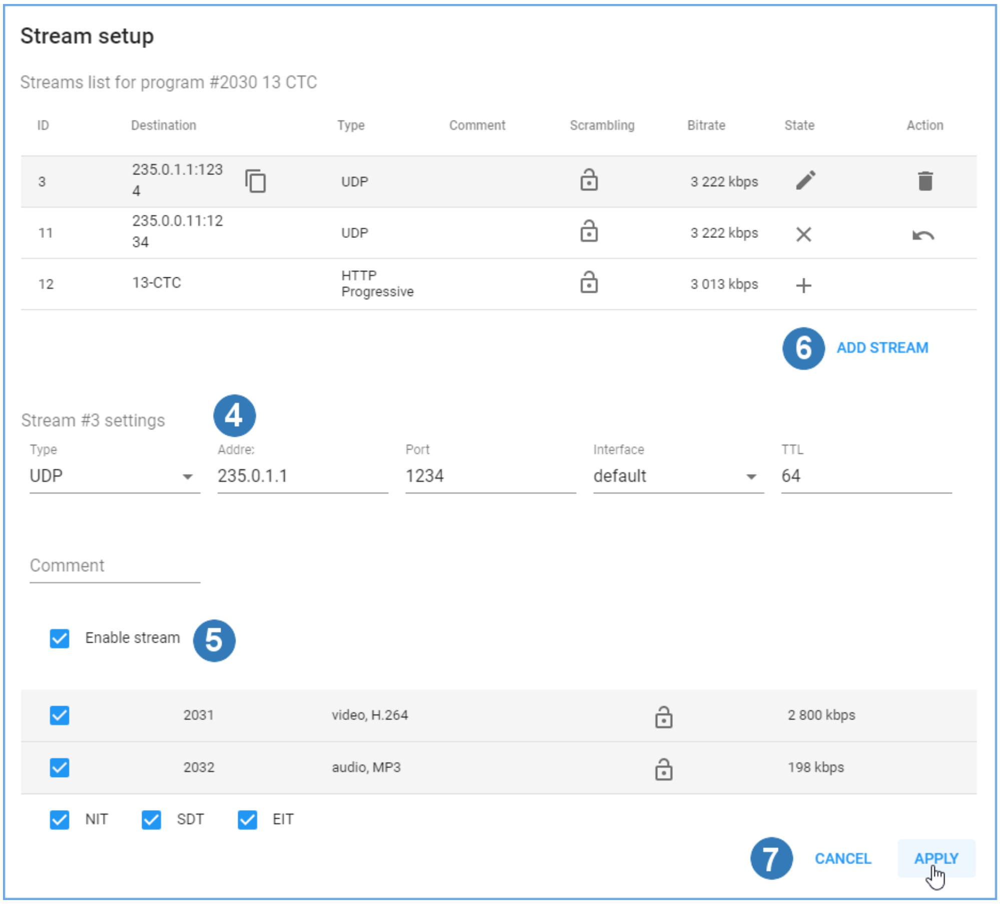
## Set up streaming

*See the description of web interface pages here:* ***Web interface: DVB to IP gateway*** *on page* ***34*** *and* ***Input settings*** *on page* ***37***

1. Open the **DVB to IP gateway** page (the **Streaming** group) in the web interface.
2. Click **Expand input** on an input panel. If necessary, configure the input. For more info, see **Configure an input** on page **14**
3. In the program list, opposite the program, in the **Streaming** column, click on the button to open the **Stream setup** window.

*The Stream setup window is divided into two parts: Stream list and Stream settings*

4. In the opened window, in the **Stream settings**, select a stream **Type** and set up the other parameters. Each type of stream has its own set of parameters.




5. Mark flags in front of PIDs and service tables (NIT, SDT, EIT) that you want to include in the stream.
6. Click **Add stream**, if you need to add another stream for the selected program, and repeat the steps number 4 and 5.

> *If you need to add several streams of the same type for one program, we recommend **adding a two-digit number in the Address field to the last digit in the fourth octet, which is one more than the previous one**, for example, if the address of the 1st stream is 235.114.3.1, then for the 2nd stream, the address can be 235.114.3.1 **01**, and for the 3rd one – 235.114.3.1 **02**. In this case it is easier to avoid IP address conflict*

7. Click **Apply**, if you want to save changes or click **Close** to close the window without saving changes.

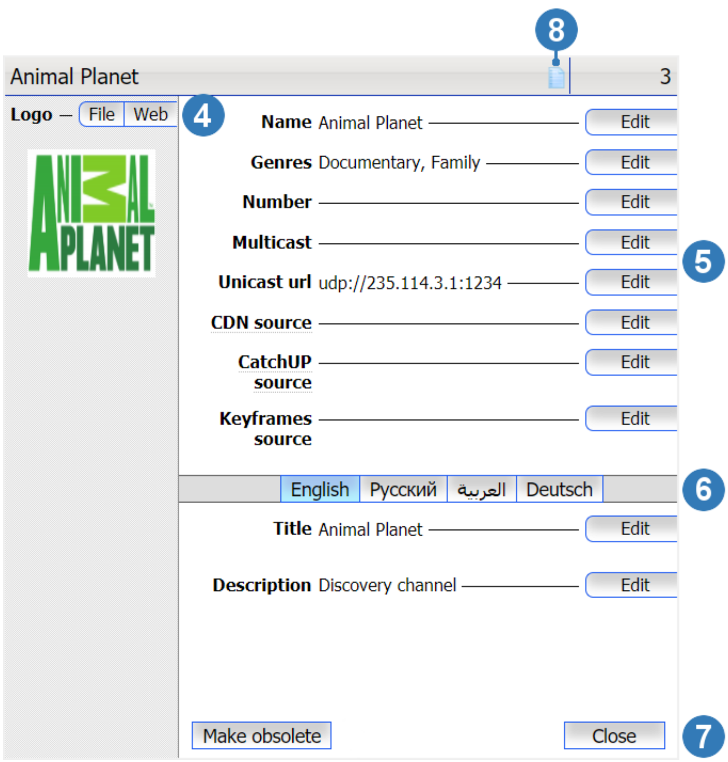
> *Turn on the corresponding option in the user interface options to edit streams for one program in a single dialog (see **Web interface: Interface options** on page **35**).*

8. If you want to edit a stream, click on a line with stream's parameters in the **Streams list** to select one and make changes in the Stream settings. The **State** column in the **Streams list** displays a pencil opposite the stream that has been changed. Click **Apply**, if you want to save changes or click **Close** to close the window without saving changes.

# Add a TV channel

*See the description of the web interface page here: **Web interface: TV Channels** on page **42***

1. If necessary, configure the input and set up streams (see **Configure an input** on page **14** and **Set up streaming** on page **16**).
2. In the web interface, open the **TV Channels** page (the **Media content** group). Click on **Add** button and in the opened window write a name for a new TV channel, then click **OK**.
3. Click on the created TV channel profile to open the **profile edit window**.




4. Use **File** or **Web** under **Logo** and upload the channel logo image from a local file or an URL.
5. Click **Edit** next to the parameter you want to change. In the opened window set parameter values and click **OK**.
6. Select a language and write a description of the channel. You can add descriptions in those languages that were added on the **Languages** page (the **Media content** group).
7. Click **Make obsolete** to remove a channel from the list of available channels or click **Close** to close the profile edit window.
8. On top of the profile edit window, opposite of the channel name, click on the **Media program** icon. The opened page shows a program guide for the channel, if it has been downloaded. You can create the program guide manually. Click **Add** to create a schedule item. Each item has the following parameters:
   - **Program code** - a unique program identifier
   - **Since** - program start time
   - **Title** - program name

- **Duration** - program duration


*The schedule is intended to be displayed in the STB interface along with the other channel-related information (description, etc.) during channel selection*

9. Open the **Service plans** page (the **Billing** group) in the manager web interface and select the service plan to which you want to add the TV channel. Click on **Add service** button and select one of the service types: **TV channels** or **TV channels in record.** In the opened window, select the created media content, fill in the other fields and click **Save**. For more info about adding services to a service plan, see **Create a service plan** on page **22**

*When adding a service to a service plan, turn on the Additional service flag, if you want that the TV channel associated with the service will be displayed in the STB interface, in the Shop section, in order for a customer to buy the access to this channel for an extra fee*

## Upload a program guide (EPG)

*See the description of the web interface page here:* ***Web interface: EPG** on page **44***

1. Open the **EPG** page (the **Media content** group) in the web interface.
2. Click **Add url** to upload a program guide (EPG) from an URL or click **Add file** to upload it from a `.xmltv` file. In the opened window, fill in the fields and click **Save**.

*If you upload the EPG from the URL, you can set the automatic update – weekly or daily*

*Uploading the EPG by FTP is done in active mode. In case the server is connected to the Internet via NAT, the router must support active FTP mode*

3. Click **Details** under the EPG to expand the channel list.

4. Select channels available in your IPTV system, then use the drop-down list to select corresponding media content and click Save to activate the settings.

| | Channel ID | Channel name | Media content |
|---|---|---|---|
| ☑ | RTR | RTR | RTR |
| ☑ | KUL | KULTURA | KULTURA |
| ☑ | MatchTV | MatchTV | Match |
| ☑ | TNT | TNT | THT |
| ☑ | STS | STS | STS |
| ☑ | Che | Che | C |
| ☑ | ZVEZDA | ZV | ZV |
| ☑ | RBK | RBK | RBK |
| ☑ | ntv+9 | ntv+9 | 9 |
| ☑ | ntv+25 | ntv+25 | BBC |

Hide details Save

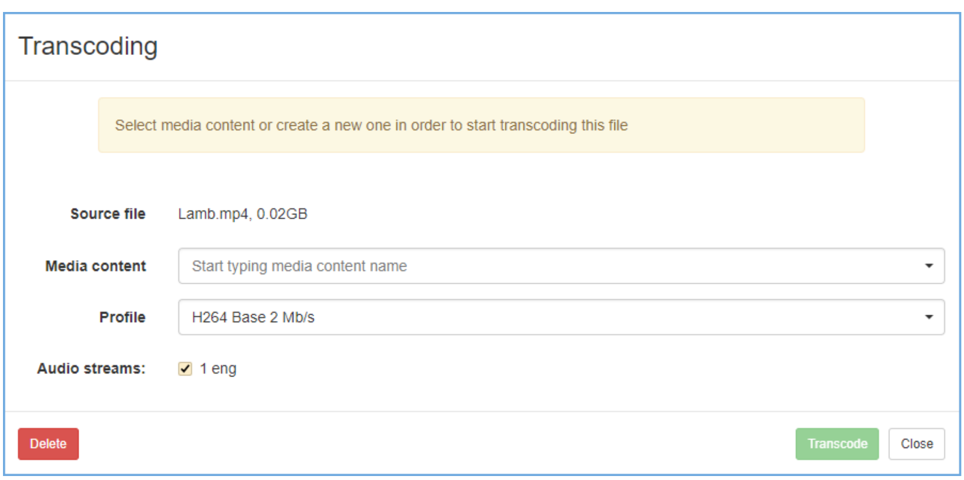
5. Open the **TV Channels** page (the **Media content** group), click on the media content associated with one of the channels and click on the **Media program** icon on top of the profile edit window, opposite of the channel name. If the opened window displays the program guide, it means that the EPG has been uploaded and configured successfully.

# Create a VOD content (a video, a movie)

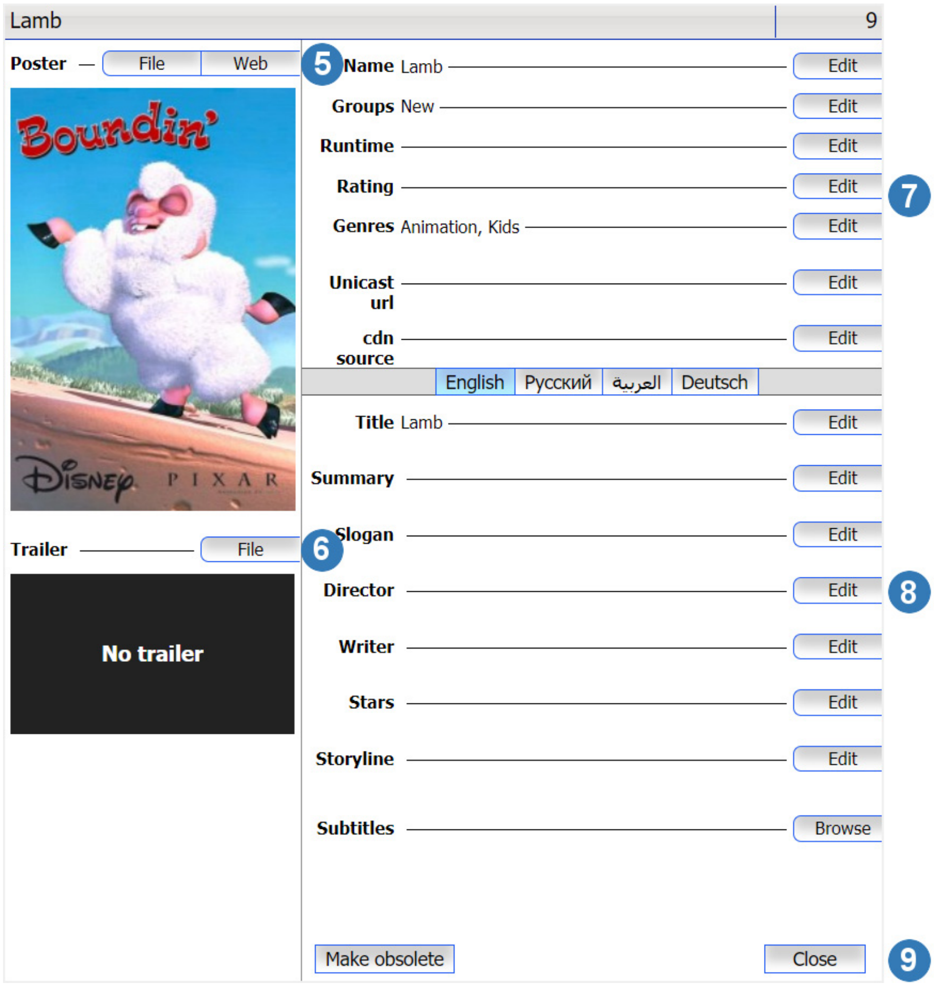
*See the description of web interface pages here:* ***Manager web interface: Manage VoD content*** *on page* ***71*** *and* ***Web interface: Movies*** *on page* ***43***

1. Open the **Manage VoD content** page (the **IPTV distribution** group) in the manager web interface and click **Upload a video** in the upper right corner.
2. In the opened window, select one or more files to upload and close the window when the upload is complete.
3. Find the downloaded file in the list on the page and click on it. In the opened **Transcoding** window follow these steps:

- write a media content name, which will be displayed in the web interface,
- select a transcoding profile, audio tracks that need to be included,
- click on **Transcode** button to add the file to the transcoding queue.



4. Open the **Movies** page (the **Media content** group) in the web interface and find the created media content. Click on the media content to open the profile edit window.




5. In the **Poster** block, use **File** or **Web** to upload image from a local file or an URL.
6. In the **Trailer** block, click **File** and upload a video trailer.

> *Upload a video trailer in MP4 (H.264 video and AAC audio) to play it on iOS mobile devices*

7. Click **Edit** next to the parameter you want to change. In the opened window set parameter values and click **OK**.
8. Select a language and write a description of the video. You can add descriptions in those languages that were added on the **Languages** page (the **Media content** group).
9. Click **Make obsolete** to remove the media content from the list of available movies or click **Close** to close the window.
10. Open the **Service plans** page (the **Billing** group) in the web interface and open the service plan to which you want to add the VOD content. Click **Add service** and select **Movies.** In the opened window, select a transcoded content, set a price and a currency, then click **Save**. For more info about adding services to a service plan, see **Create a service plan** on page **22**

> *A customer can purchase a VOD content, if the VOD content is included in the customer's service plan*

## Combine media content

> *See the description of web interface pages here: **Manager web interface: Media groups** on page **66** and **Media content groups** on page **65***

1. Open the **Media groups** page (the **Media content** group) in the web interface, select one of content type and click it.
2. On the opened page, in the upper right corner, click **Create new media group**. In the opened window write a group **Name** and click **Save**.

> *You can not delete a media group, you can only edit its name*

3. Open the **Media content groups** page (the **Billing** group), use the sorting and filtering to find a media content and click on it. If you want to add several items at once, check the corresponding boxes on the left and click **Add to groups** to combine content.

> *Check the corresponding boxes opposite of the content and click Remove from groups to remove selected items*

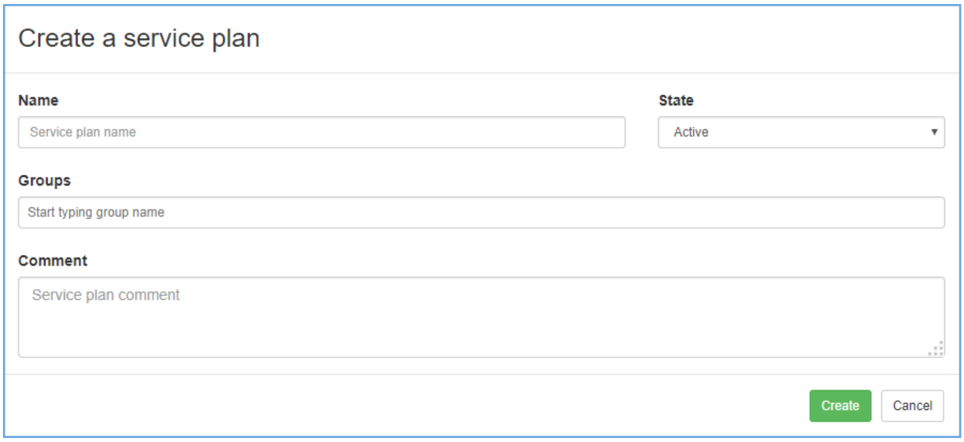
4. In the opened window, start typing a media group name, select a group from the drop-down list and click **Save**.


## Create a service plan

> *See the description of web interface pages here: **Manager web interface: Service plans** on page **63** and **Service plan page** on page **64***

1. Open the **Service plans** page (the **Billing** group) in the web interface and click **Create a service plan** in the upper right corner.

2. In the opened window fill in the fields and click **Create**.

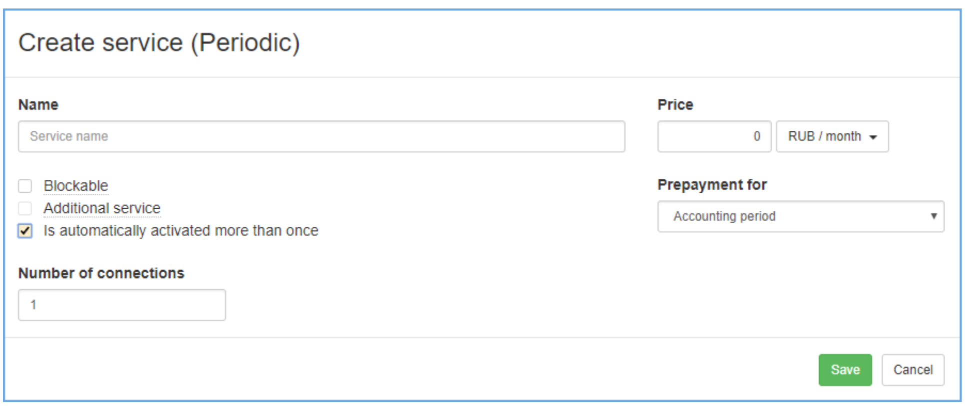



> *When creating a service plan, you can set the **Being edited** state. A service plan in this state can't be attached to a customer. When finishing setting up a plan (when all of required services were added), change the plan state to the **Active***

3. On the service plan's page, click **Add service** and select the required service type from the drop-down list:

- **Basic services**: periodic and one-time;
- **IPTV**: TV channels, TV channels in record, movies, radio

4. In the opened **Create service** window, fill in the fields and click **Save**.




**Pay attention to:**

- a name of the **IPTV** service is generated automatically and it includes a name of the selected media content or media group to which this service provides access and for **Basic services**, you must write the name on your own;
- price units in a **Periodic** service (i.e. USD / month, USD / day) affect the final cost and do not affect the frequency of charges for using this service. The frequency of charges is affected by the **Prepayment for** parameter
- a service price can be set in those currencies that were previously added on the **Currencies** page (the **System** group in the manager web interface);
- turn on the **Blockable** flag in a service, if you want to stop providing and charging the service when a customer's personal account is blocked;
- turn on the **Additional service** flag, if you do not want to attach the service automatically with the service plan. A customer can add such service via the STB interface, in the Shop section, or you can attach it to a customer via the manager web interface, on the customer's personal account page, in the service plan panel;

- if you add a **group of TV channels** to a service plan as an additional service, buying this group, a customer gets access to all the TV channels from this group;
- for movies (one or a group), you can add them to service plans only as additional services. That means, a customer has to buy them via the STB interface in the **Shop** section or via the NetUP mobile and the NetUP WEB interfaces. If a movie is in several groups, its price is calculated as the lowest price among those groups.

5. Add all the services to the created service plan, repeating steps 3 and 4.
6. Use buttons on the service's panel to **Edit, Delete service** or **Enable** and **Disable for multiple**. You can enable or disable a service only for a multiple (group of personal accounts) which has attached the same service plan that includes the service.

*You can not delete the service that was attached to at least one customer*

## Create a standalone service

Standalone services can be attached separately of a service plan and only by NetUP.tv system users via the web interface.

*See the description of the web interface page here:* ***Manager web interface: Standalone services*** *on page* ***65***

1. Open the **Standalone services** page (the **Billing** group) in the manager web interface, click **Add service** in the upper right corner and select one of the service type from the drop-down list: **Periodic** or **One-time**.
2. In the opened window fill in the fields and click **Create**.

*Turn on the Blockable flag in a service, if you want to stop providing and charging the service when a customer's personal account is blocked*

3. Use buttons on the service's panel to **Edit** or **Delete** the service.

*You can not delete the service that was attached to at least one customer*

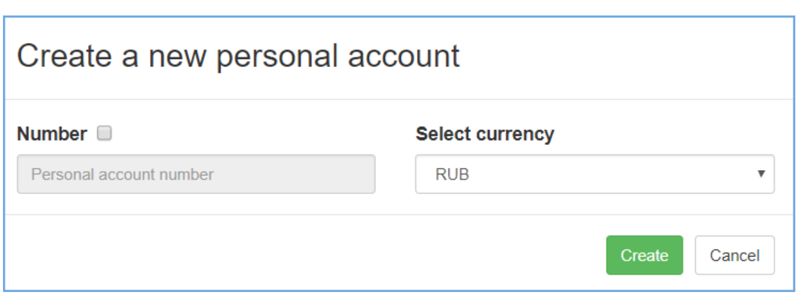
## Create a customer and a customer's personal account

*See the description of the web interface pages here:* ***Manager web interface: Customers*** *on page* ***59***

1. Open the **Customers** page (the **Customers** group) in the manager web interface, click on the **Add customer** button in the upper right corner and select a customer type: an individual or an organization. In the opened window fill in the fields and click **Create**.

*The password for a new customer is automatically generated and can be changed manually*

2. In the bottom of the custom info page click **Create a new personal account**.
3. In the opened window select a currency and write a personal account number, if it's necessary, then click **Create**



**Pay attention to:**

- **the personal account number** is automatically created, but **for the hotel solution** the personal account number must necessarily match the room number, so you must write it **manually**;
- if the list does not have **the required currency**, add it on the **Currencies** page (the **System** group)
- a customer can use **Login and Password** to login when the customer has at least one personal account

*When you have added a personal account to a customer, you can activate an access card for this customer, make a payment to the customer account and attach a service plan and services*

## Make a payment to an account

*See the description of the web interface pages here:* ***Manager web interface: Customers*** *on page* ***59***

1. Open the **Customers** page (the **Customers** group) in the manager web interface, use sorting and filtering to find a customer and left-click on the line with the customer data.
2. On the **Personal account** page, in the right part of the **Balance** panel, click **Menu** and select **Payment**.

*If you see the custom info page, the customer does not have a personal account. Create a personal account and then return to the payment operation. How to create a personal account see in the previous section*

3. In the opened window, fill in the fields and click **Save**.

## Attach or switch a service plan

*See the description of the web interface page here:* ***Manager web interface: Customers*** *on page* ***59***

1. Open the **Customers** page (the **Customers** group) in the manager web interface, use sorting and filtering to find a customer and left-click on the line with the customer data.
2. In the bottom of the **Personal account** page, in the right part of the **Current service plan** panel, click **Menu** and select **Attach** or **Switch**.
3. In the opened window, select the service plan, specify the Start date and the End date and then click **Save**.

**Pay attention to:**

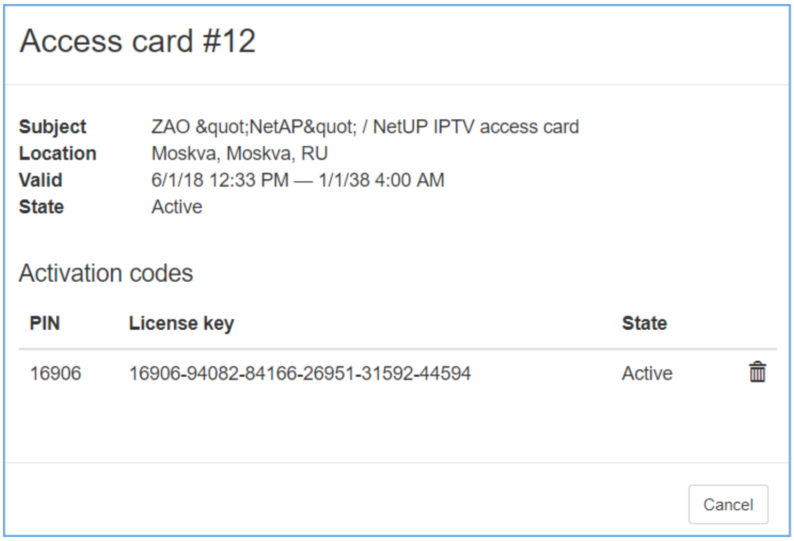
- if you want to attach a service plan to a customer immediately, do not specify Start and End dates for the service plan;
- if a service plan switch is scheduled to a specific date, both plans will be shown on the customer's personal account page in different panels - **Current service plan** and **Next service plan**;
- if you want to see the list of attached service plans, click **Reports** and select **Attached services history** on the upper right part of the **Personal account** page.

## Generate an activation code for an access card

Connecting the STB at first time, a customer need to activate the access card with activation code (PIN and License key). The code is generated automatically after creating a personal account for the customer. If the customer needs to use another device with the same access card (for example, when the customer wants to use a new STB), generate a new activation code for the customer.

*See the description of the web interface page here:* ***Manager web interface: Customer's personal account page*** *on page* ***60***

1. Open the **Customers** page (the **Customers** group) in the manager web interface, use sorting and filtering to find a customer and left-click on the line with the customer data.
2. In the right part of the **Overview** panel, click on the **Menu** button and select **Access card** to open the access card info window.




3. In the bottom part of the opened window, in the **Activation codes** panel, click **Generate activation code**. This function is available if the subscriber does not have activation codes or the code is assigned the status “USED”.

## Reset the counter of activation requests

If 10 failed activation requests were received from one IP address, the further requests from this IP address will be ignored during the next hour. After one hour, the counter will automatically reset and you can try to activate a STB again. If you need to activate the STB faster, the NetUP.tv system administrator can reset the counter manually.

*See the description of the web interface page here: **Manager web interface: Activation requests** on page **68***

1. Open the **Activation requests** page (the **Security** group) in the manager web interface, use filtering to find an IP address, and left-click on it.
2. In the opened window, change the state to **Active** and the counter value to zero, then click **Save**, or delete the counter.

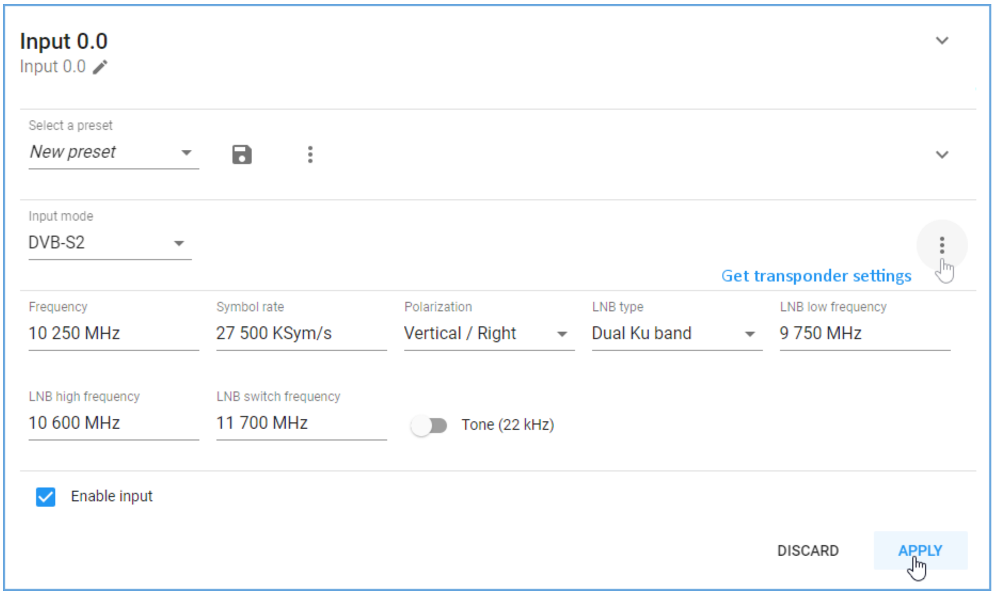
## Add an additional server in the cluster

*See the description of web interface pages here: **Web interface: Network** on page **54** and **Connections** on page **48***

1. Open the **Network** page (the **System configuration** group) in the web interface.
2. Click on the **Change Core IP** button and write the IP address of your IPTV Core server.
3. Restart the server to be added to the cluster.
4. Open the **Services** page (the **System configuration** group) in the IPTV Core web interface and restart **Cluster** service.
5. In the IPTV Core web interface, open the **Connections page** (the **System status** group) and make sure that the required server appears in the list.

# Set up streaming

1. Open the **DVB to IP gateway** page (the **Streaming** group) in the web interface.
2. Click on an input panel to expand it and access settings.
3. Enter transponder parameters in one of the ways:

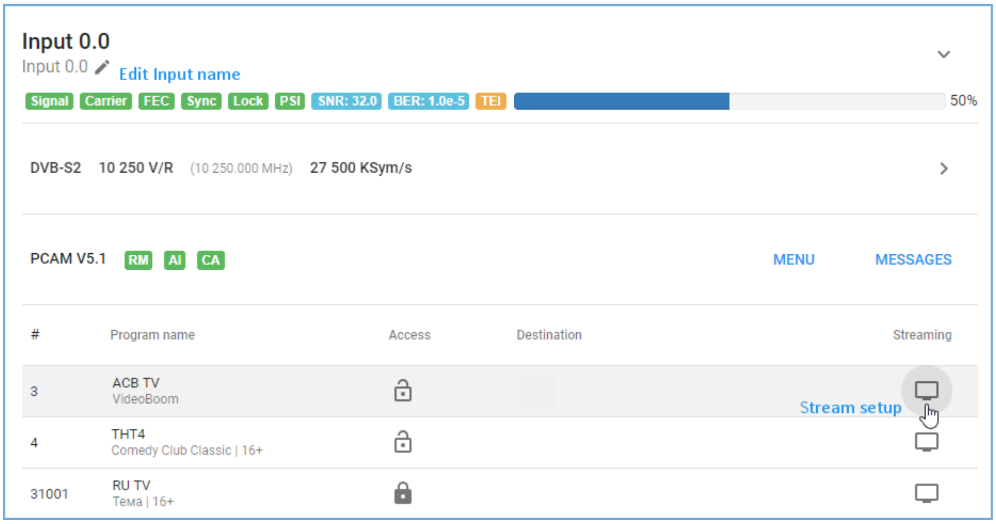



- Select **Input mode** (DVB-S, DVB-S2, DVB-T, DVB-T2, DVB-C Annex A, ISDB-T) and fill in all the parameters manually. Each of Input modes has its own set of parameters, and the list of available modes depends on the DVB adapter type. For more info, see **Web interface: Input modes** on page **39**.
- **Get transponder settings** – click on the **Get transponder settings** button on the right and select the option: **Satellite database** or **Browse network.** In the opened window, select one of available transponders to fill in the form using its parameters.

*__Browse network__ is available for DVB-S and DVB-S2*

- **Select a preset** from the saved presets list. For more info, see **Usage examples: Create and edit a preset** on page **15**

4. Press **Apply**. As a result, the panel displays input signal quality indicators and the list of programs for the selected frequency.




*You can assign a name to the input.*
*Click on the pencil icon under input number, write Input name and save it.*

5. Select one of the available channels and open **Stream setup** window to add output streams.
6. Repeat 3-5 steps for each input.

## Set up streaming to the network

*See the description of web interface pages here: **Web interface: TV Channels** on page **42** and **Manager web interface: Service plan page** on page **64***

1. Connect the device's DATA output to the network that you are going to stream.
2. Start streaming from the device and make sure that it can be played back inside the network, e.g., with VLC. Keep in mind that VLC requires a '@' before the IP address of a media stream. E.g., udp://@225.1.0.25:1234

*Setting up, you should use an unprivileged port (e.g., 1234). Using a privileged port may cause playback problems on some devices*

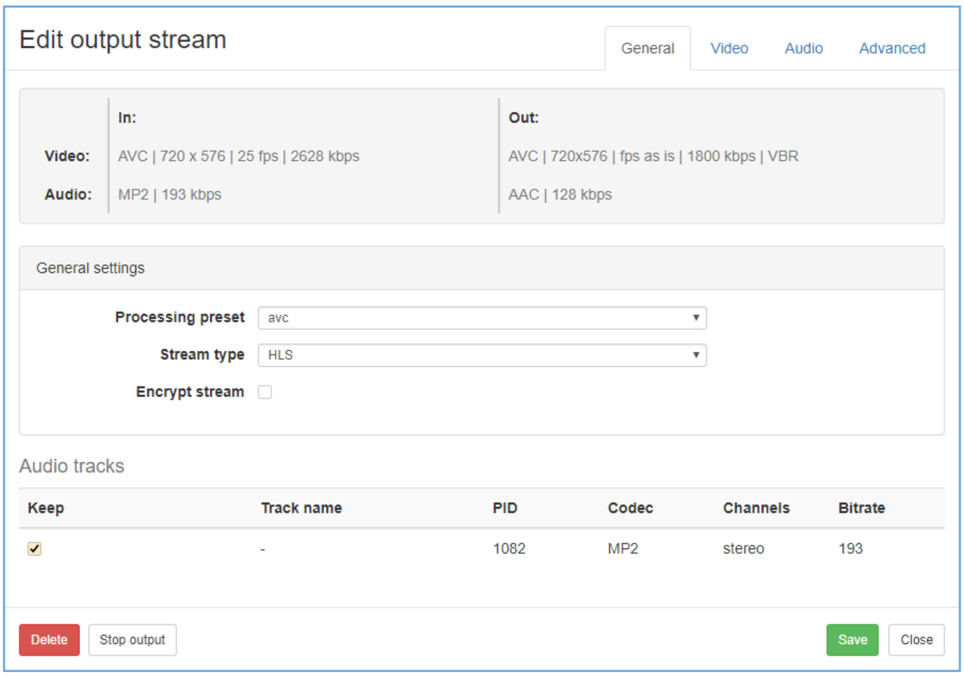
3. Open the **TV channels** page (the **Media content** group) in the web interface and create a media content for each of the streamed TV channels (see **Add a TV channel** on page **18**).
4. Add the created media content to a service plan (the **IPTV => TV channels** service) and attach the service plan to customers.

*You can combine media content into groups. For more info, see **Combine media content** on page **22***

# Set up transcoding

*See the description of web interface pages here:* ***Manager web interface: Processing presets*** *on page* ***72*** *and* ***Processing setup*** *on page* ***73***

1. Open the **Processing presets** page (the **Video stream processing** group) in the manager web interface and click **Add preset** in the upper right corner of the page.
2. In the opened window set up settings for stream processing and click **Save**.
3. Open the **Processing setup** page (the **Video stream processing** group) in the manager web interface and click **Add input** in the upper right corner of the page, and select a stream type.
4. In the opened window fill in the fields and click **Save.**
5. On the **Processing setup** page, find the created input stream and click on it.
6. On the opened **Manage output streams** page, on the **Output streams** panel, click **Add output**.
7. In the opened window, select the created processing preset, if it's necessary, edit video and audio setting for the stream and click **Save**.




*Adding the output stream, you can change processing settings on Video and Audio tabs. This changes does not affect the preset.*
*Video and Audio tabs are available for all the preset types, except Pass through (pass the stream as is with no processing)*

# Set up a Catch UP service

*See the description of the web interface page here:* ***Manager web interface: Processing setup*** *on page* ***73***

1. Open the **Processing setup** page (the **Video stream processing** group) in the manager web interface and click **Add input** in the upper right corner, then fill in required fields and click **Save**.

*If you need to set up a CatchUP service for an existing stream, find it in the list and left-click on it*

2. On the opened **Manage output streams** page, on the **Output streams** panel, click **Add output** and create the **HLS** stream or select an existing HLS stream.
3. In the Add output stream window, open the **Advanced** tab and specify **Storage duration** option in hours. Click **Save** and copy the output stream address.
4. Open the **TV Channels** page (the **Media content** group) in the web interface and create a TV channel profile (or open an existing one) for which you need to set up a Catch UP service. For more info, see **Add a TV channel** on page **18**
5. Paste the output stream address in **CatchUP source** and save changes.

> *Make a change to the copied output stream address.*
> *Instead of **relay** you should write **catch-up**, instead **index** – **manifest**.*
> *For example, on the Manage output streams page the output stream address is 'http://10.1.0.119/hls/relay/MLxbfu-/index.m3u8', so, you should write 'http://10.1.0.119/catch-up/hls/MLxbfu-/manifest.m3u8' in the CatchUP source*

6. In the manager web interface, open the service plan for which the CatchUP service will be available, and add the 'TV channels service in the record' to it. For more info, see **Create a service plan** on page **22**
7. Turn on a STB, go to the TV Guide and make sure that the icon ( ) appears opposite the channel. For more info, see **NetUP.tv Android client: TV guide** on page **85**

# LCD panel

## Introduction

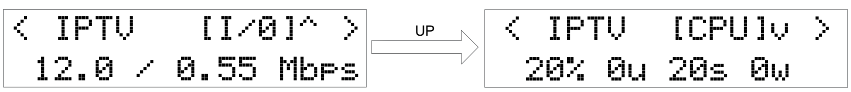
When you start the NetUP server with LCD panel:
1. Plug the network and power cables into the device.
2. Switch power on. You shall see *Starting...* on the LCD panel.
3. Use the LCD manager for the initial setup of the system.

> *LCD manager provides a convenient way to monitor the CPU and LAN interface load on the device front panel, as well as to assign IP addresses to network adapters*

## Statistics screen

Among other items, the LCD menu contains two statistics screens. The default screen displays the network adapters traffic transfer rate. The lower line of the screen presents the total rate of input and output traffic separated by **“/”**.

Use **Up** and **Down** buttons to navigate through menu elements. Press **Up** to switch to the CPU load screen.




First number is the total CPU load. Three subsequent numbers give, correspondingly, the portions of CPU load related to user tasks (**u**), system tasks (**s**), and awaiting data from the peripherals (**w**). Press **Down** to return to the traffic statistics screen.

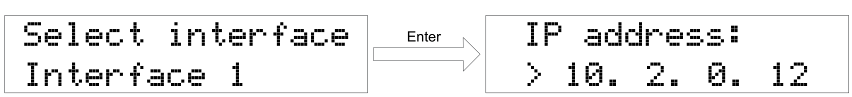
Press **Down** to navigate to the rest of menu items:

- **Reboot system** – restart server
- **Shutdown system** – shutdown server
- **Generate (Reset) password** – generate a new admin password

> ***Generate password** allows to reset the administrator’s password. The new administrator’s password is displayed on the LCD until a key is pressed on the front panel*

## Set IP address and subnet mask

1. To do that, press **Fn**, then **Enter** on any statistics screen. The network configuration screen will appear.




2. Press **Up** and **Down** to select the network interface, then press **Enter**.
3. If you need to **edit IP address** press **Fn** and then **Up** or **Down** to select an octet for editing. The selected octet will be indicated by a symbol " **>** ". Press **Up** or **Down** without **Fn** to change the selected octet.
4. Then press **Enter** to go to edit the subnet mask. Press **Up** or **Down** to set up the network mask and increase or decrease the number of mask bits. Press **Enter** to go to the save settings dialog.
5. Select **Yes** to save the IP address and select **No** to cancel settings. Buttons **Up** and **Down** switch between options, with currently selected option emphasized with brackets. Press **Enter** to confirm the selection.
6. When the settings are done, set up your DNS server (via its config file) to associate the IP address just entered with `mw.iptv` domain name.

# Generate new administrator's password

1. Starting from the statistic screen, press **Up** until you see the **Reset Password**.
2. Press **Enter** to generate new password and apply it to all system components. The password will be displayed on the LCD screen.

# Web interface

## Overview

Web interface is used for setting up various server parameters and client's STBs.

To access the web interface, enter an **IP address of Middleware server** in your browser's address bar. On the opened page enter the login and the password specified in the equipment passport.

*It is strongly recommended to change the password immediately after logging in for the first time. For more info,* *see **Security** on page **56***

The left panel of the web interface contains links to settings pages, pages are organized into groups. The presence of pages and groups depends on the hardware configuration of the server and the privileges of the currently logged in system user.

The web interface can include:

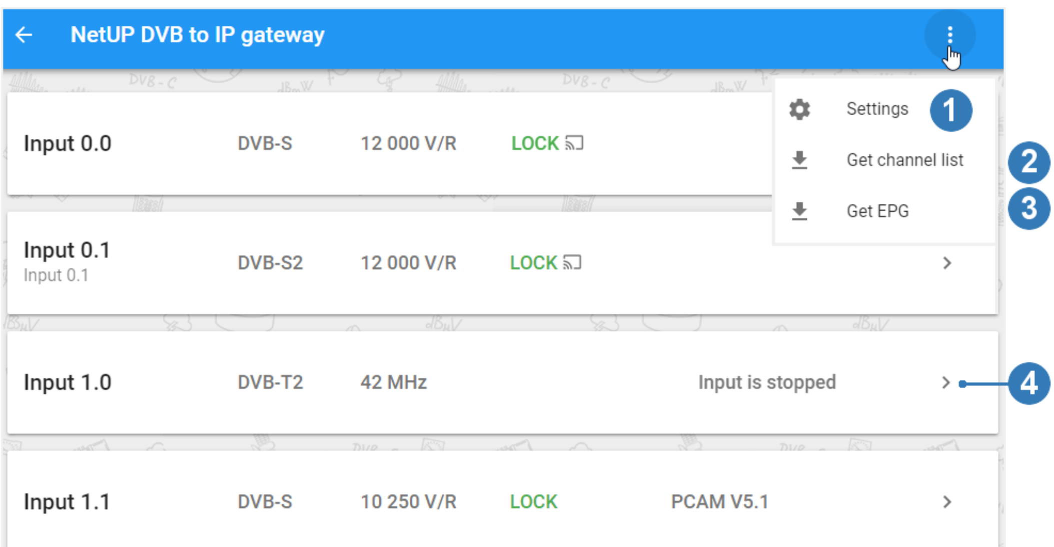
| Group | Page | Function |
|---|---|---|
| **Interfaces** | Does not contain pages | Jump to the manager web interface |
| **Streaming** | **DVB to IP gateway** | Control the NetUP Streamer, see CAM module parameters, set up transponders and output streams |
| **Media content** | **Languages** | Manage languages which used to describe content |
| | **TV Channels** | Manage TV content |
| | **Radio** | Manage Radio content |
| | **Movies** | Manage VoD content |
| | **EPG** | Import EPG |
| | **Advertising messages** | Manage advertising messages |
| | **Media group** | Manage media groups |
| | **MyTV** | Set up parameters for broadcasting scheduled video files |
| **System status** | **Connected Clients** | Reboot the system and remote channel switch |
| | **About** | Get info about components, license and server hardware |
| | **Connections** | Get info about NetUP.tv systems |
| | **Storage** | Get info about disk space usage |
| **Android client** | **Shop** | Set up the Android shop |
| | **Home page** | Set up the Android home page |
| | **Settings** | Set up parameters of the NetUP.tv client for Android |
| | **Main menu** | Edit the Android home page menu |
| | **Info page** | Edit the Android info page |
| **IPTV** | **SNMP agents** | Set up SNMP, download the MIB file |
| **System administration** | **Files** | Download the Administrator’s Guide |
| | **Power Management** | Reboot and shutdown server |
| | **Status** | Get info about the services |
| | **Backup** | Manage backup |

| Group | Page | Function |
|---|---|---|
| **System configuration** | **Network** | Manage network interfaces and VLANs |
| | **Routing** | Manage user routing rules |
| | **Security** | Change the admin password |
| | **Services** | Start and stop the services |
| | **Date and time** | Select timezone and set up server time |
| | **Licence** | Download licenses |

# Streaming

## DVB to IP gateway

This page displays all available inputs. Each input has its own panel.
If an Input is enabled, the panel displays *mode and frequency of the input stream*, *signal decoding information*, and *CAM name*.
If an Input is not enabled, the panel displays *Input is stopped.*




*Inputs in the web interface are numbered as inputs on the rear panel of the NetUP Streamer (see* ***Streamer*** *on page* ***7****)*

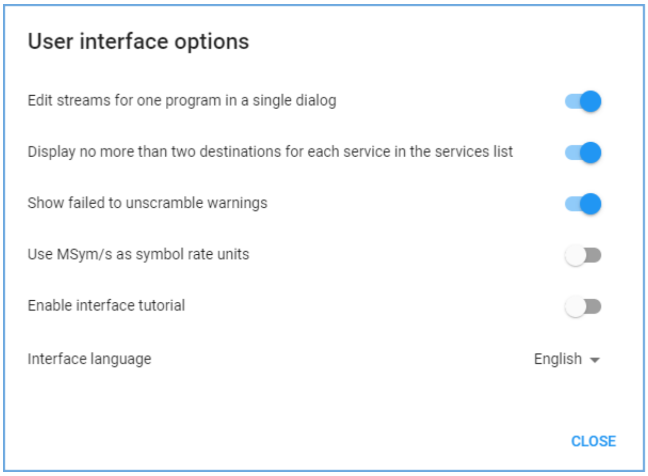
The following actions are available on the page:

1. **Tune the page interface**
   Click on the Interface options button and select *Settings.* In the opened window, enable or disable the available options and click *Close.* For more info, see **Interface options** on page **35**
2. **Get channel list**
   Click on the Interface options button and select *Get channel list.* In the opened window, select a format: *XML* or *M3U*, and click *Download* or *Copy.*
3. **Get EPG**
   Click on the Interface options button and select *Get EPG.* In the opened window, select a format: *JSON* or *XMLTV*, and click *Download* or *Copy link to EPG.*

4. **Expand the panel with input settings**
   Left-click on the corresponding button on the input panel you want to configure. For more info, see **Input panel** on page **36**

## Interface options

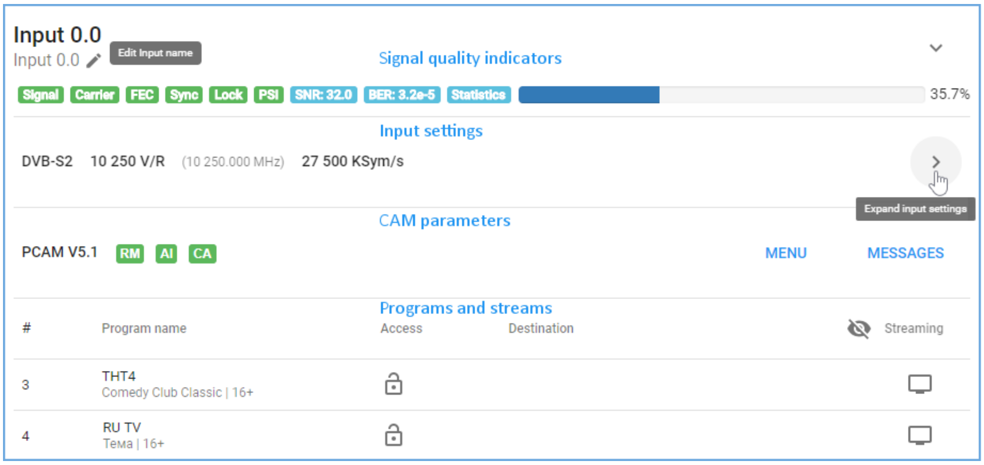
Click the button in the upper-right corner of the **DVB to IP gateway** page to open the Interface options window and enable / disable the following options:




- **Edit streams for one program in a single dialog** – enable the option if you want to set up all output streams for one program in a single common window. For more info, see **Usage examples: Set up streaming** on page **16**.
- **Display no more than two destinations for each service in the services list** – enable the option if you want to display no more than two destinations for each service in the common list of services in the input panel.
- **Show failed to unscramble warnings** – disable the option if you want to hide warnings about decoding errors on the **NetUP DVB to IP gateway** page.
- **Use MSym/s as symbol rate units** – enable the option if you want to switch symbol rate units. Default symbolic speed is in KSym/s.
- **Enable interface tutorial** – enable the option if you want to run a short tutorial on NetUP DVB to IP gateway.
- **Interface language** – select English or Russian for the interface.

## Input panel

Click *Expand input* on the required input panel to access its settings.




If you have already configured the signal for the selected input, the expanded input panel displays:

- **Signal quality indicators**
- **Input settings**
- **CAM parameters**
- **Programs and streams**

If the input signal is not set or turned off, the expanded input panel only includes transponder settings. How to configure the input signal, see **Usage examples: Configure an input** on page **14**.

*Click on the pencil icon under the input number, write 'Input name' and save it.*

## Signal quality indicators

Click *Expand input* on an input panel to see quality indicators

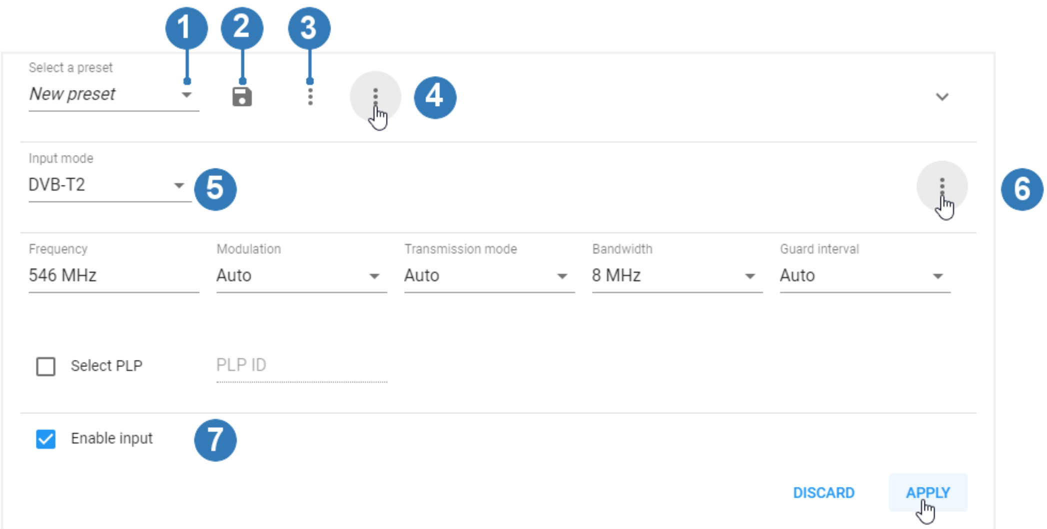
If the input is enabled, there are the following indicators:

- **Signal** – denotes presence of the signal (red means no signal);
- **Carrier** – denotes presence of the carrier frequency (red means no carrier);
- **FEC** – denotes the error correction;
- **Sync** – denotes synchronization with the signal;
- **Lock** – means that the adapter has locked on the signal and is decoding it successfully;
- **PSI** – program specific information: PAT, PMT, SDT, NIT, EIT, and etc. Click on the indicator to see more;
- **SNR** – signal to noise ratio;
- **BER** – bit error rate;
- **Statistics** – transport stream statistics. Click on the indicator to see more;
- **Signal strength** – signal strength in percent.

The status of the indicators changes after each update of the input signal parameters.

## Input settings

Click *Expand input settings* to access the settings.




The following actions are available on the panel:

1. **Upload input and streaming settings from a preset**
   *Select a preset* from the list and the web form displays the parameters stored in the preset. If necessary, you can change parameter values.

> *Changing parameter values in the web form does not affect the preset. To find out how to modify a preset, please see* ***Usage examples: Configure an input using a preset*** *on page* ***15***

At the bottom of the panel, click *Apply* and select *Apply input settings* to upload only input settings, or select *Apply both input and streaming settings* to load the input settings first and then click *Load* to upload the streaming settings from the same preset.

> *Input settings and streaming settings from the same preset are downloaded separately.*
> *If the preset stores only input settings, the panel displays* ***Load.*** *If a preset stores input and streaming settings, the web form displays* ***Apply***

2. **Save or edit a preset**
   Set the parameters to configure the input and click *Apply*. If necessary, set up streaming settings, then select from the preset list *New preset* and click *Save preset.* In the opened window write the preset name and click *Save.*

> *The preset stores input and streaming settings. Read more here* ***Usage examples: Set up streaming*** *on page* ***16***

*Select a preset* from the preset list, modify input settings and / or streaming settings, apply changes and click *Save preset.* In the opened window edit the preset name, if necessary, and click *Save.*

> *For more info, see* ***Usage examples: Create and edit a preset*** *on page* ***15***

3. **Delete a preset**
   *Select the preset* from the list and click *Delete preset.*

> *Deleting a preset does not affect the broadcasting. A set of preset settings is used only to quickly fill out web forms*

4. **Import or export a preset**
   Click *Other actions* and select *Import*. In the opened window select a file and click *Open.*
   Select a preset from the list, click *Other actions* and select *Export*. The preset will be uploaded to a file.

> *Exporting and importing templates is done in json format*

5. **Set transponder parameters manually**
   Select *Input mode* (DVB-S, DVB-S2, DVB-T, DVB-T2, DVB-C Annex A, ISDB-T), set all parameters manually and click *Apply.*

> *Each of Input modes has its own set of parameters, and the list of available modes depends on the DVB adapter type. For more info, see* ***Input modes** on page **39***

6. **Get transponder settings**
   Click *Get transponder settings* and select one of available lists: *Satellite database* or *Browse network.* In the opened window, select one of available transponders to fill in the form using its parameters.

> *Browse network is available for DVB-S and DVB-S2*

7. **Enable or disable an input**
   Turn on or off the corresponding flag on the input panel and click *Apply.*

> *After disabling the input, all output streams will be automatically disabled. After re-enabling the input, all output streams that were set up before disabling will be automatically enabled*

### Input modes

| Input mode | Parameter | Description |
|---|---|---|
| **DVB-S/DVB-S2** | Frequency | The signal frequency |
| | Symbol rate | The rate of symbol transfer |
| | Polarization | Vertical / Right, Horizontal / Left or Disabled |
| | LNB type | Dual Ku band, Single Ku band, C band. Once it is selected, the corresponding values of LNB parameters appear in their fields |
| | LNB low frequency | The LO frequency for the low-frequency range of satellite signal. See the hardware specifications for particular values |
| | LNB high frequency | The LO frequency for the high-frequency range of satellite signal |
| | LNB switch frequency | The border between satellite signal frequency ranges |
| | Port group | A, B, C, D or off |
| | Tone | Enables controlling the LNB by feeding a special 22 kHz tone to it |
| **DVB-C Annex A** | Frequency | The signal frequency |
| | Modulation | QAM 16, QAM 32, QAM 64, QAM 128, QAM 256 or Auto |
| | Symbol rate | The rate of symbol transfer |
| **DVB-T/DVB-T2** | Frequency | The signal frequency |
| | Modulation | QPSK, QAM 16, QAM 64 or Auto |
| | Transmission mode | 1K, 2K, 4K, 8K, 16K, 32K or Auto |
| | Bandwidth | 8MHz, 7MHz or 6MHz |
| | Guard interval | 1/32, 1/16, 1/8, 1/4 or Auto |

*For DVB-S2 and DVB-T2, the **Select PLP** option is available*

**PLP (Physical Layer Pipe)** is a logical channel that may carry one or multiple services. You can specify the ID of the channel that you want to receive in the corresponding field.

## CAM parameters

Click *Expand input* on an input panel to see the CAM parameters:

- CAM status or name

*If CAM is not enabled, the panel displays only “CAM: missing”*

- RM (Resource manager)
- AI (Application information)
- CA (Conditional Access Support)
- MMI (Man-Machine Interface)

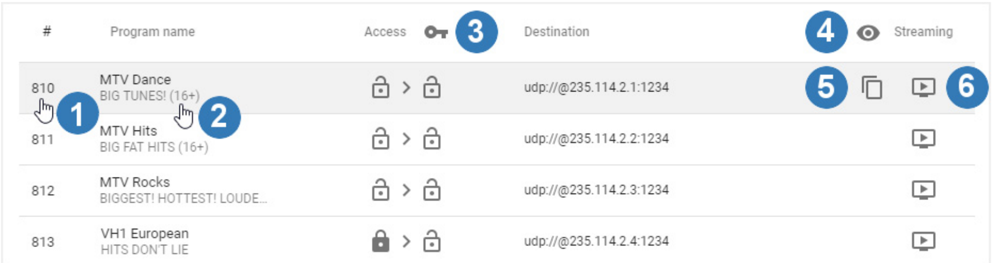
*Click MMI to close MMI session*

- Menu (CAM settings)
- Messages

Click on RM, AI, CA indicator to see more details about CAM.

## Programs and streams

Click *Expand input* on an input panel to see the list of received programs and to set up streams.




*You can see the list of received programs, if you have configured the input signal. How to configure the input signal, see* ***Usage examples: Configure an input*** *on page* ***14***

The following actions are available on the panel:

1. **Open program properties**
   Click on a *Program number* to see program properties.
2. **Open the program schedule for the near future**
   Click on a *Program name* to see the names of the program that is on the air and the next one.
3. **Test descrambling**
   Click on the corresponding button, then select programs in the opened window, and click *Test.* The test results will be displayed opposite each of the programs.

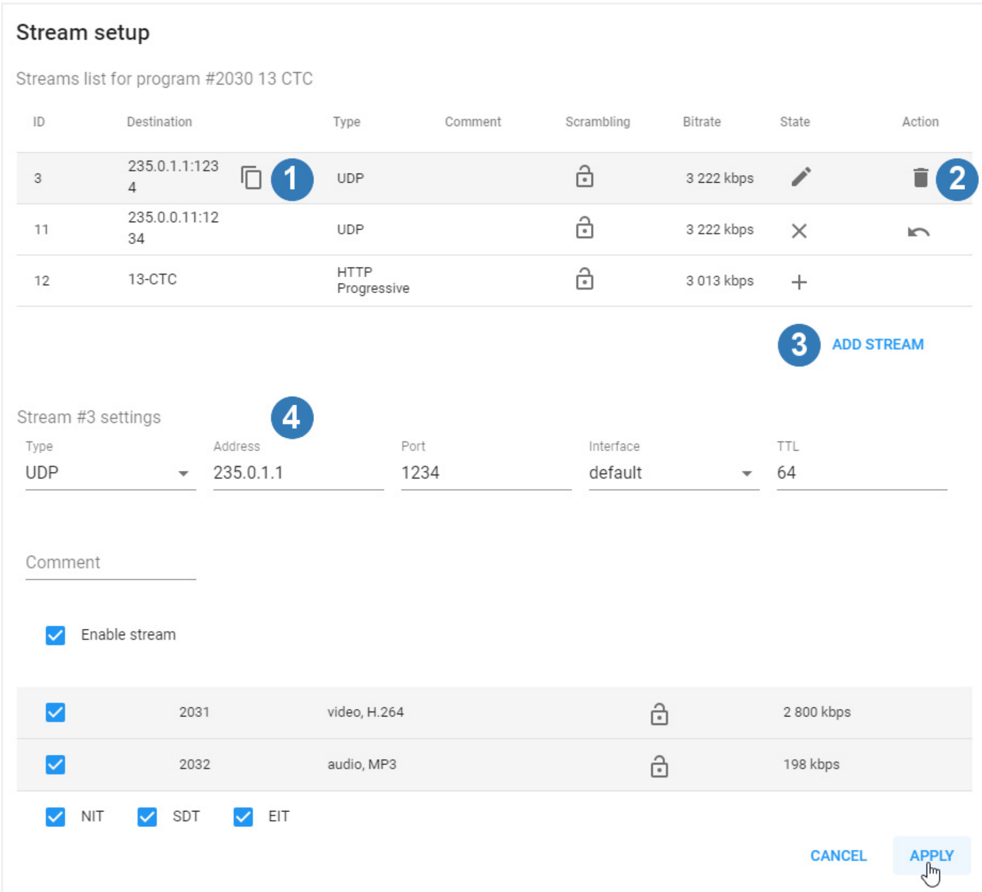
*This option is available for encrypted streams. If the lock is closed, the stream is encrypted. If the lock is opened, the stream is decrypted*

4. **Hide idle services**
   Click on the corresponding button on the panel, now only programs with active streams are shown. Click on this button again to show all programs.
5. **Copy an output stream address**
   Click on the copy icon next to the stream address. If the program has more than one output stream, click the copy icon and select the address you want to copy If the stream is one, it will be copied immediately after clicking.
6. **Set up streaming**
   Click on the corresponding button opposite of the program you want to set up output streams for. In the opened **Stream setup** window, add and configure required number of streams, then click *Apply* and close the window. Added streams will appear in the program list in the column *Destination.*

*The description of the Stream setup window is in the next section. See an example of setting up a stream here* ***Usage examples: Set up streaming*** *on page* ***16***

## *Stream setup*

On the input panel, opposite the required program, click on the button in the **Streaming** column to open the **Stream setup window**. The window is divided into two parts: **Streams list** and **Stream settings**.




> *Turn on the corresponding option in the user interface options to edit streams for one program in a single dialog (see **Web interface: Interface options** on page **35**).*

The following actions are available in the window:

1. **Copy an output stream address**
   Click on the copy icon next to the stream address. The stream address will be copied to clipboard.
2. **Delete an output stream**
   Move the mouse over the line with the stream you want to delete and the *Action* column will display the delete icon. Click on this icon and the *State* column will display the appropriate mark. Click *Back* to uncheck the mark or click *Apply* to delete the selected stream (streams).
3. **Add a stream**
   Click *Add stream* and set the stream parameters. Click *Apply* to save the added stream (streams).
4. **Configure stream settings**
   Add a stream or select the existing one with the left mouse button and make sure that the *Stream settings panel* displays the required stream ID. Select the stream *Type* and fill in the parameter fields. Each type of stream has its

own set of parameters. Then check PIDs and service tables (NIT, SDT, EIT) that you want to include in the stream. If necessary, change settings of other streams and click *Apply* to save changes.

*In the Stream list, the State column displays the pencil icon for streams which have been edited and the plus icon for streams which have been added.*

# Media content

## Languages

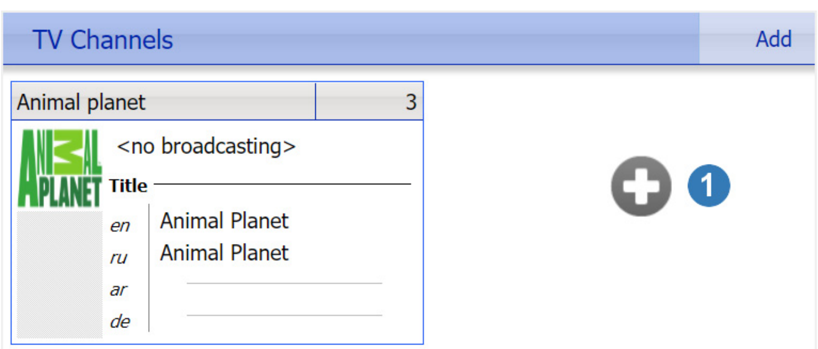
This page contains the list of languages that can be used to describe content.

The following actions are available on the page:

1. **Add a language**
   Click *Add*, then in the opened window, fill in the fields and click *Apply*.
2. **Delete a language**
   Left-click on the language you want to delete, and in the opened window, click *Delete*.
3. **Select a default language**
   Left-click on the language you want to set as default. In the opened window check the *set as default* box and click *Apply*. You can do this when adding a language to the system as well.

## TV Channels

This page displays the list of TV channel profiles. The profile may contain the name and logo of the TV channel, description in various languages, genres, channel number, etc.



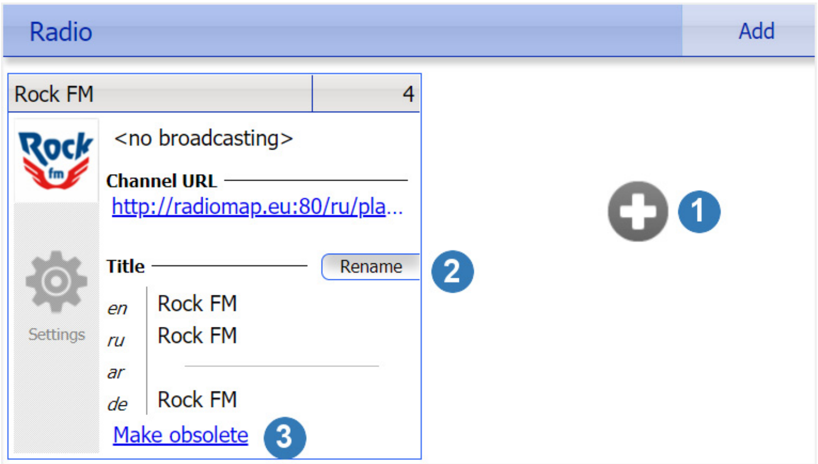

The following actions are available on the page:

1. **Add a profile**
   Click on the *Add* button or the Plus-shaped button. In the opened window fill in the fields and click *Apply.*
2. **Edit a profile**
   Left-click on the profile you want to edit. In the opened window click *Edit* next to the row you want to change, fill in the fields and click *OK*. Make changes and click *Close.*
3. **Delete a profile**
   Left-click on the profile you want to delete. In the opened window click *Make obsolete.*

*See an example of adding a TV channel here **Usage examples: Add a TV channel** on page **18**)*

## Radio

This page displays the list of radio profiles. The profile may contain the name and logo of the radio channel, description in various languages, channel URL, multicast address.

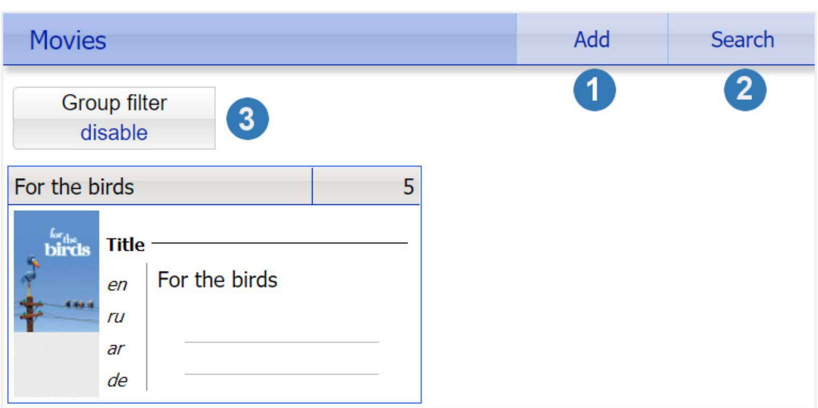



The following actions are available on the page:

1. **Add a profile**
   Click on the *Add* button or the Plus-shaped button. In the opened window, fill in the fields, upload the logo and click *OK.*
2. **Edit a radio channel name**
   Click *Rename* in the profile of the radio channel you want to edit. In the opened window write the name in all available languages and click *Apply.*
3. **Delete a radio channel**
   Click *Make obsolete* in the profile of the radio channel you want to delete.

## Movies

This page displays the list of movie profiles (media content). The profile may contain a variety of information about the video, including a poster and a trailer.




The following actions are available on the page:

1. **Add a media content (profile)**
   Click *Add*, then in the opened window, write a name of a new movie and click *OK.*

> *A media content can be automatically created as a step in the video transcoding process. For more info, see* ***Manage VoD content*** *on page* ***71*** *and* ***Usage examples: Create a VOD content (a video, a movie)*** *on page* ***20***

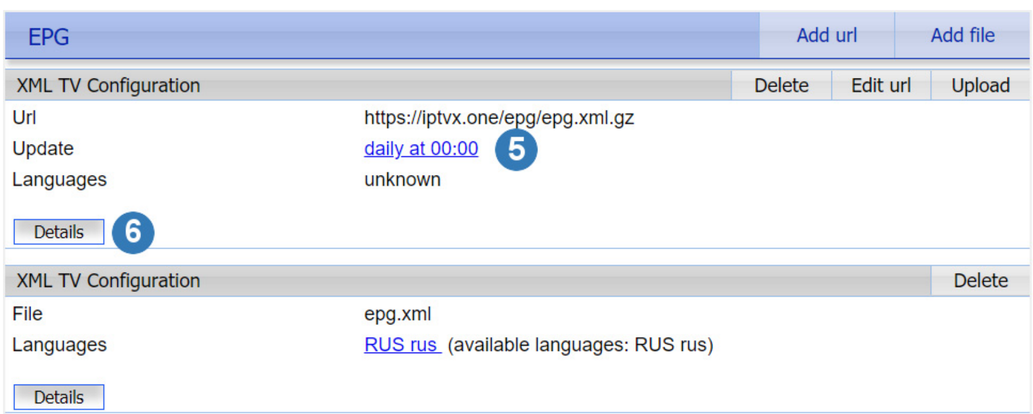
2. **Find a media content by its name**
   Click *Search*, then in the opened window, write the media content name and click *OK.* The search will open the window for editing the found profile.
3. **Filter media content by group**
   Click *Group filter*, select from drop-down list one of the groups and the page will display media content from this group. If you want to see all available media content, select *disable.*

> *For more info, see* ***Manager web interface: Media content*** *on page* ***66***

4. **Edit a media content**
   Left-click on the media content you want to edit. In the opened window click *Edit* next to the row you want to change, fill in the fields and click *OK*. Make changes and click *Close.*
5. **Delete a media content**
   Left-click on the media content you want to delete. In the opened window click *Make obsolete*.

## EPG

This page displays a list of program guides that have been added to the system. Each EPG has its own panel.




The following actions are available on the page:
1. **Add an EPG**
   Click *Add url* to download the program guide from URL or click *Add file* to upload a XMLTV file. In the opened window fill in the fields and click *Save*.

> *You can set an update schedule for the EPG downloaded from URL*

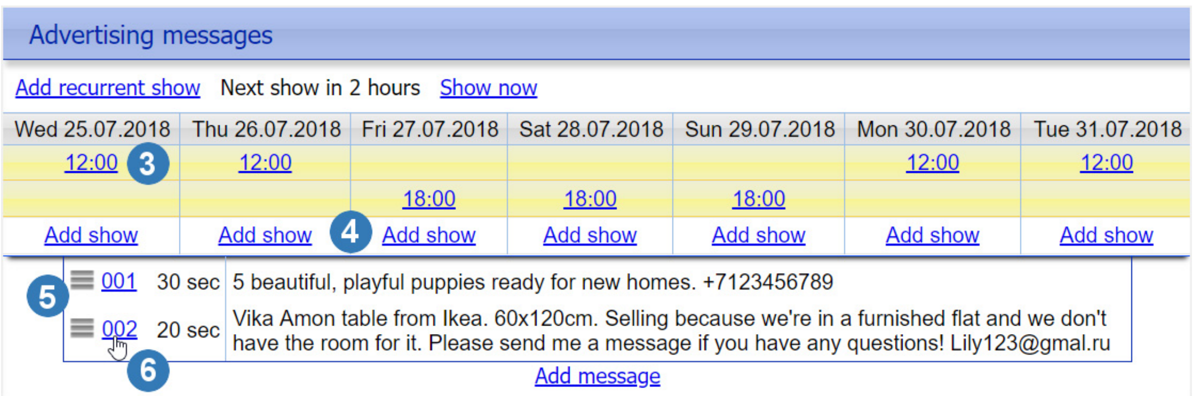
2. **Delete an EPG**
   Click *Delete* on the panel of the EPG you want to delete.
3. **Change URL for an EPG**
   Click *Edit url* on the panel of the EPG for which you want to edit the URL. In the opened window edit the URL and click *Save.*
4. **Upload an EPG**
   Click *Upload* on the panel of the EPG downloaded from URL.

5. **Edit an update schedule for an EPG**
   Left-click on the update schedule you want to change. In the opened window make changes and then click *Apply.*
6. **Edit an EPG**
   Click *Details* on the EPG panel to see a program list. Make changes and click *Save*. Then click *Hide details* to collapse the program list.

*For more info about adding and editing an EPG, see* ***Usage examples: Upload a program guide (EPG)*** *on page* ***19***

## Advertising messages

This page displays a list of ads shown via STB.




The following actions are available on the page:
1. **Add an ad schedule**
   Click *Add recurrent show*, then in the opened window, select time and days to repeat ads and then click *Apply.*

*All ads are displayed during each of the shows*

2. **Show ads now**
   Click *Show now* to run ads immediately.
3. **Change a show time**
   Left-click on the show time you want to edit. In the opened window make changes and then click *Apply*.
4. **Add a show time**
   Click *Add show* in the column of the day you want to show ads. In the opened window select the time and click *Apply.*
5. **Set an ad sequence**
   Drag the ad with the button on the left and place it in desired position. Ad number in the list will change accordingly.

*The priority of showing ads depends on the ad number in the list*

6. **Edit or delete an ad**
   Left-click on the number of the ad you want to edit or to delete. In the opened window make changes and click *Apply* to save the ad or click *Delete* to remove it.
7. **Add an ad**
   Click *Add message*, then in the opened window, specify the add duration, write the ad text and click *Apply.*

*WYSIWYG editor window is used to add and edit messages*

## Media group

This page displays the list of media groups. A media group can combine content of the same type: TV, Radio, VoD.

The following actions are available on the page:

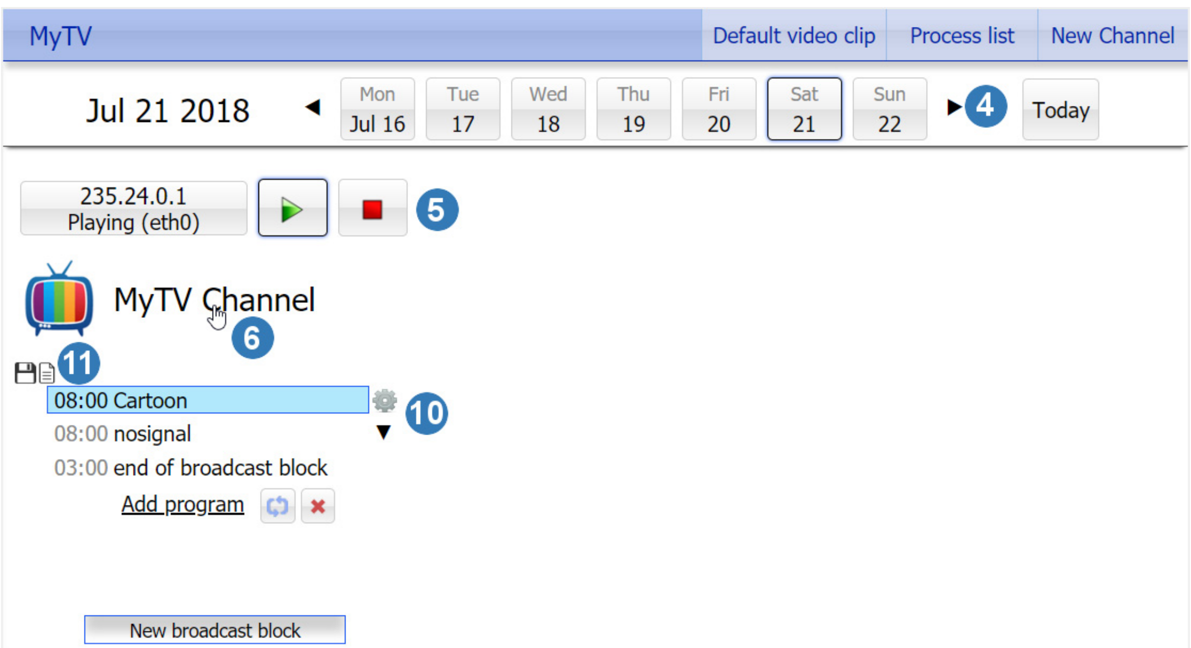
1. **Create a new media group**
   Click *Add,* then in the opened window, write a name of a new group, select the content type and click *Apply.*

*You can not delete a media group, you can only edit its name*

2. **Edit a media group name**
   Left-click on the group you want to edit. In the opened window make changes and then click *Apply*.

## MyTV

This page displays the list of created channels and video broadcast schedules for them.




The following actions are available on the page:

1. **Add a default video**
   Click *Default video clip* to upload the video file you want to play on all MyTV channels during pauses in the schedule.

*Use FTP or SCP to delete video from server*

2. **See a list of transcoding videos**
   Click *Process list* to open the list of videos queued for transcoding. In the opened window select the video file you want to transcode out of turn and click *Encode.*
3. **Add a new MyTV channel**
   Click *New TV Channel,* then in the opened window, write the name of the channel, its multicast address and click *OK.*
4. **See a broadcast schedule**
   Left-click on the date for which you want to open the broadcast schedule. Use *left and right arrows* to move through the calendar for the week forward or backward, and click *Today* to open the current day schedule.

5. **Play or stop broadcasting**
   Click on the corresponding button on the panel of the channel you want to play or stop broadcasting.

*Under the channel address, you can see the broadcast status: Stopped or Playing*

6. **Edit a channel profile or delete it**
   Left-click on the channel name. In the opened window make changes and click *Close* to save them and close the window or click *Make obsolete* to delete the channel.
7. **Create a video broadcast schedule**

*The schedule consists of blocks. For each block, you need to set the start time of the broadcast and download or create a playlist (video set)*

   Click *New broadcast block*, then in the opened window set the start time and click *OK*. Click *Add program*, then in the opened window choose one of the options for uploading videos: **Upload** (upload a new video and transcode it if necessary), **Encode** (transcode uploaded video) or **Reuse** (add already used video).
   Select the video and click *OK.*
8. **Enable block repeat**
   Click on the corresponding button under the block you want to repeat and when the last video from the playlist ends, the first video from this playlist will start playing.
9. **Delete a block from a schedule**
   Click on the corresponding button under the block you want to delete.
10. **Change the video sequence or remove a video from the block**

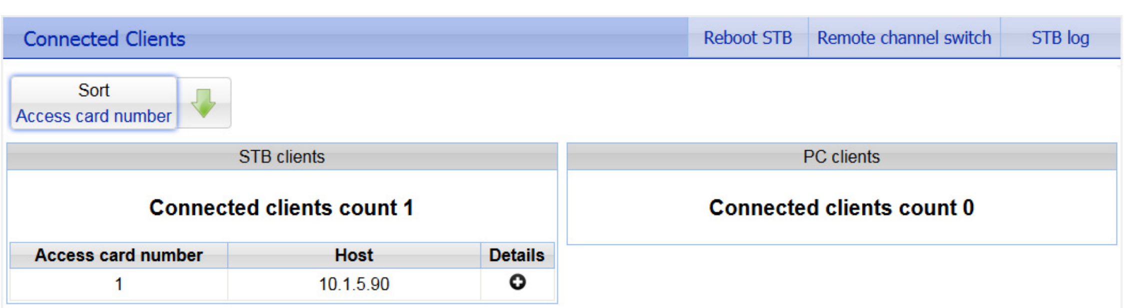
*The video sequence – from top to bottom*

   Left-click on a video name and additional buttons will appear to the right of the video. Click on the *arrow* icon to move the video up or down.
   Click on the *cogwheel* icon and then click *Delete* in the opened window to remove the video from the block.
11. **Save or load a playlist**
   Click on the corresponding button on the block panel to save a list of videos as the playlist or load the one of the previously saved playlists.

# System status

## Connected Clients

This page displays two lists (*STB clients* and *PC clients*), which show info about the connected customers.




The following actions are available on the page:
1. **Reboot an STB remotely**
   Click *Reboot STB*, then in the opened window, enter the number of the access card used by the STB and click *OK*.

2. **Switch a channel remotely**
   Click *Remote channel switch*, then in the opened window, select the channel you want to switch and click *Next*. Select STBs for which you want to switch the channel: **All STBs** (all connected set-top boxes), **Group** (STBs of customers included in a certain group) or **STBs with access card number** and click *OK*. After that, you will see the statistic window. It will show how many STBs succeeded and failed.

> *Remote channel switch is only available for Android based STBs*

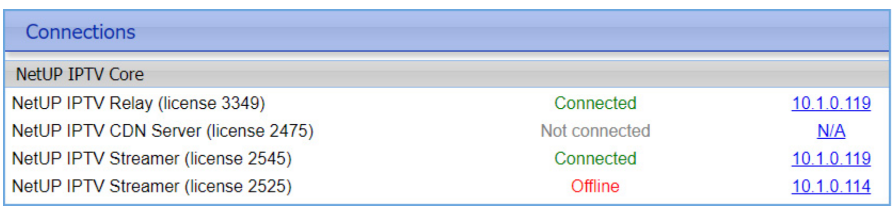
3. **Download an STB log**
   Click *STB log*, then in the opened window, enter the number of the access card used by the STB and click *Download.*
4. **Sort the list of connected clients**
   Click on the left part of the sort button to select the sorting criteria: *Access card number* or *Host.* Click on the arrow next to the sort button to sort the list by ascending or descending order.
5. **See detailed information about a connected client**
   Click on corresponding button in the *Details* columns on the panel of the selected customer.

## About

This page keeps info about the NetUP.tv system: product and firmware versions, build numbers of individual systems, information about the license and server hardware (CPU, memory, hard drives and network interfaces).

## Connections

This page displays all the systems of the NetUP.tv. Each of the systems has a separate panel. The panel displays a list of systems with which interaction is possible. Addresses of interacting systems are links.



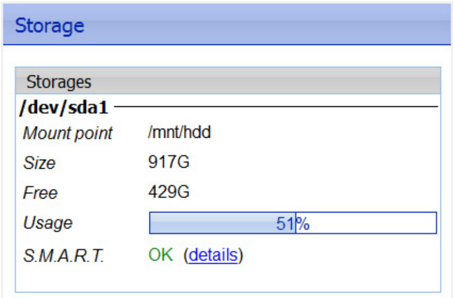
Connections

| NetUP IPTV Core | | |
|---|---|---|
| NetUP IPTV Relay (license 3349) | Connected | 10.1.0.119 |
| NetUP IPTV CDN Server (license 2475) | Not connected | N/A |
| NetUP IPTV Streamer (license 2545) | Connected | 10.1.0.119 |
| NetUP IPTV Streamer (license 2525) | Offline | 10.1.0.114 |

The following actions are available on the page:
1. **Change a system address (server host)**
   Left-click on the system address you want to change. In the opened window write the address manually or click *Auto detect* to detect the address automatically, then click *Apply* to save changes.

## Storage

This page displays disk space usage S.M.A.R.T. and RAID condition report.

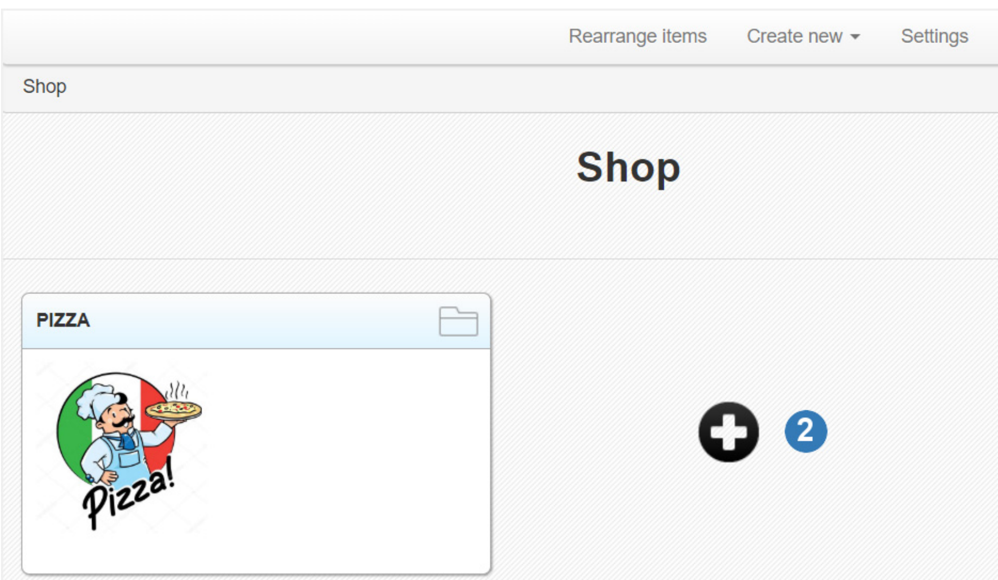



*Click on details to see the detailed S.M.A.R.T. or RAID condition report.*

# Android client

## Shop

This page contains the interface for setting up a shop. The shop is displayed in the menu of the NetUP.tv Android client.




The following actions are available on the page:

1. **Rearrange items on the page**
   Click *Rearrange items* and use the mouse to move and arrange items in the required order. Then click *Save* to confirm the new order or click *Cancel* to return to the previous order.
2. **Add items**
   Click *Create new* or the plus-shaped button and select *Item* or *Category*. On the opened page, write the item or category name, upload the logo and click *OK*.

*The category may contain subcategories*

3. **Change general settings**
   Click *Settings*, then in the opened window, write *Currency* (that you want to use for all items in the shop), *Send orders to* (the e-mail for orders) and *Sender address*, then click *OK*.
4. **Edit an item or delete it**
   Left-click on an item or a category. In the opened page click *Change name* to edit the item or category name or *Upload* to set an image for the item or category. In the upper right corner, click *Remove* to delete the selected item or category.

## Home page

This page contains a toolbar for customizing your home page. The home page is displayed on the main screen of the NetUP.tv Android client interface.

The TinyMCE editor is used to configure the page. Using the tools of this editor, you can not only customize the appearance of the home page, but also add HTML widgets, for example, AccuWeather or Twitter (the corresponding button is located in the bottom row of the toolbar).

*Click Save in the upper right corner to apply the changes*

## Settings

This page contains a set of parameters that configure the NetUP.tv Android client:

| **Global settings** | |
|---|---|
| `Home page URL` | Write the address you want to display for the home page |
| `Stop playback when idle` | Check the box if you want TV playback to stop automatically when a customer hasn't pressed any buttons on their remote for a certain time. Set the timer in the **Idle time (minutes)** row. |
| `Restart playback after given time in minutes` | Check the box if you want TV playback to resume automatically after a certain time. Set the time limit in the **Playback time (minutes) before restart** row |
| `Start up mode` | Select the required STB launch behavior: **Regular startup**, **Resume TV playback** (turn on the TV channel that played before turning off the STB) or **Play by URL** (turn on a certain channel). In the last case, specify the channel URL |
| `Home page background` | Select an image for the home page background |
| `Allow prepaid cards` | Check this box to allow customers to use prepaid cards |
| `Update URL` | Specify the address where the update file is located |
| `Request confirmation before installing updates` | Check the box if you want to show confirmation before installing updates |
| `Install updates when download finishes` | Check the box if you want to install updates immediately after the download is complete |
| `Install updates at next reboot` | Check the box if you want to install updates at next reboot |
| `Hide "Check for updates" item from the settings menu` | Check the box to hide the **Check for updates** option in the NetUP.tv Android client **Settings** menu |
| `Download updates automatically` | Check the box if you want to download updates automatically |

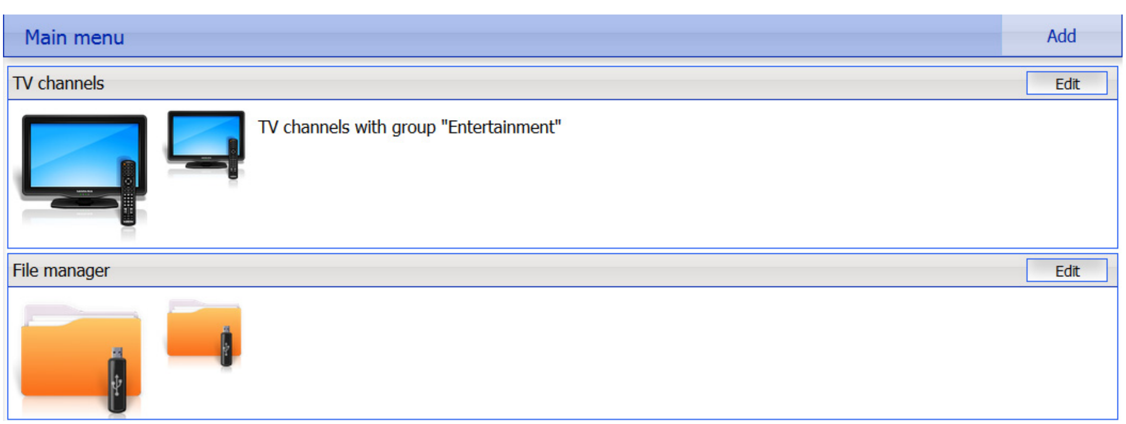
| Global settings | |
|---|---|
| `Use custom account replenishment notification` | Write a message for a customer who need to replenish the account. The following substitutions are available for this message:<br>`{personal_account}` – the customer's account number,<br>`{access_card}` – the customer's access card,<br>`{days_left}` – the approximate number of days left before the customer's account is blocked |
| `Use custom service plan expiration notification` | Write a message about the expiration of the service plan. The following substitutions are available for this message:<br>`{personal_account}` – the customer's account number,<br>`{access_card}` – the customer's access card,<br>`{days_left}` – the approximate number of days left before the customer's account is blocked. |
| `Personnel password` | Enter a personnel password. This password is required to reset the STB activation and some apps can be configured to require password to launch |
| `Activate STB with login/password` | Check the box if you want to use the login and password instead of access card to activate an STB |
| `Scroll advertising messages` | Check the box to allow scrolling of advertising messages |
| `Display advertising message at the top of the screen` | Check the box if you want to display advertisements at the top of a screen |

| Allowed applications | |
|---|---|
| `All` | Select this option to allow the customers to launch all available applications |
| `List` | Create a list of applications that customers can use. Separate application names by comas. Add a "#" in front of every application that you want to require a personnel password to launch |
| `Two lists` | Create two lists of applications that customers can use: for all customers and for blocked customers. Separate application names by comas. Add a "#" in front of every application that you want to require a personnel password to launch |

*Click **Submit** on the bottom of the page to save changes*

## Main menu

This page allows you to customize the menu that is displayed on the home page of the NetUP.tv Android client. All the menu items are shown as separate panels.




The following actions are available on the page:

1. **Rearrange items in the menu**
   You can change the order of the menu items by dragging the items with the mouse. Hover the mouse over the top of one element's panel, click and hold the left mouse button until you move the element.
2. **Add a menu item**
   Click *Add*, then in the opened window, fill in the fields and click *Save*.
   - `Item type` – the item type, e.g. Settings, Movies, Radio etc.
   - `Item name` – the item name for displaying in the menu.
   - `Page title` – the item name for displaying on the page that this menu item opens.
   - `Use custom icons` – the URL or image for the main menu (Large icon) and for the page that this menu item opens (Small icon).
   - `Media group` – the media group which combines TV channels that will be available to the customer after selecting this item menu. This is only available for TV channels.
   - `URL` – the web address for displaying on the page that this menu item opens. This is only available for the WebPortal
   - `Package name` – the application name which will be run after selecting this item menu. This is only available for External application.
3. **Edit settings of an item or delete it**
   Click *Edit* on an item panel. In the opened window make changes and click *Save* to apply them or click *Delete* to exclude the item from the menu.

## Info page

This page contains a toolbar for customizing your info page that is displayed in the main menu of the NetUP.tv Android client.

The TinyMCE editor is used to configure the page.

*Click Save in the upper right corner to apply the changes*

# IPTV

## SNMP agents

This page contains the list of communities entitled to make SNMP requests.

The following actions are available on the page:

1. **Download MIB file**
   Click *Download MIB-file* to get the `.txt` file. The NetUP's MIB file contains a template for the following information:

| **netupCpuTable** | **containing information about every CPU (core) in the system** | |
|---|---|---|
| `netupCpuEntry` | an element that describes each row of the table and combines elements: | |
| | `netupCpuIndex` | the CPU number |
| | `netupCpuLoad` | the CPU load level |
| | `netupCpuTemp` | the CPU temperature |

| **netupStreamerTable** | **containing information about every streamer in the system** | |
|---|---|---|
| `netupStreamerTableEntry` | an element that describes each row of the table and combines elements: | |
| | `adapterNumber` | the adapter number |

| netupStreamerTable | containing information about every streamer in the system | |
|---|---|---|
| | `netupBER` | the bit error rate |
| | `netupSNR` | the signal to noise ratio |
| | `netupLOCK` | the signal lock status |

| netupStorageTable | containing information about every hard drive in the system | |
|---|---|---|
| `netupStorageTable` | an element that describes each row of the table and combines elements: | |
| | `netupStorageIndex` | the storage number |
| | `netupStorageDevice` | the path to the storage (for example, "/dev/sda1") |
| | `netupStorageMountPoint` | the mounting point of the storage (for example, "/mnt/hdd") |
| | `netupStorageFilesystem` | the file system of the storage |
| | `netupStorageBlockSize` | the block size on the storage |
| | `netupStorageFragmentSize` | the fragment size on the storage |
| | `netupStorageSize` | the storage size |
| | `netupStorageFree` | the free space on the storage |

| For the system as a whole: | |
|---|---|
| `netupMemPhisTotal` | the total memory size |
| `netupMemPhisFree` | the free memory size |
| `netupMemPhisBuffers` | the buffer size |
| `netupMemPhisCached` | the cache memory size |
| `netupMemSwapTotal` | the maximum size of the swap file |
| `netupMemSwapFree` | the free space within the swap file |
| `netupStbClients` | the number of connected STB clients |
| `netupPcClients` | the number of connected PC clients |
| `netupTotalClients` | the total number of connected clients |

*To request all available parameters, download the MIB file, pass it to the SNMP daemon, and run the following command:* `snmpwalk -v2c -c netuptest 10.1.0.77 NETUP-MIB::netup`

2. **Add an agent**
   Click *Add agent*, then in the opened window, fill in the fields and click *Save*.
3. **Edit parameters of a community or delete it**
   Left-click on the community's IP address. In the opened window make changes and click *Save* to apply them or click *Delete* to remove the community.

# System administration

## Files

Here you can download the “NetUP.tv Administrator's Guide” in Russian or English.

## Power Management

Here you can *Reboot* and *Shutdown* the server. Whenever the server needs to be reloaded or shut down, this should be done exclusively by means of these controls; abnormal termination may lead to system failure.

## Status

The page displays:

- **Backup** – backup status;
- **Timezone** – selected timezone;
- **Licence** – license number and owner;
- **Internet** – Internet connection status;
- **Server password** – password for SSH and FTP connection;
- **Status of adapters and system components** – NetUP IPTV Core, Middleware, Billing, etc.;
- **Connections between systems** – connection presence.

*Using the corresponding button, you can collect diagnostic information about the services to send it to technical support*

## Backup

The page contains the list of backups – `.tar.bz2` archives that contain the system settings.

*The page is present only on IPTV Core servers*

The following actions are available on the page:

1. **Create a backup manually**
   Click *Create* to save an additional copy of system settings.

*Automatic backup is made every day*

2. **Delete, download a backup or restore system settings**
   Left-click on an archive. In the opened window click one of the following buttons: *Delete* – remove the archive, *Download* – load the tar.bz2 archive, *Restore backup* – apply system settings from the archive.

*Before restoring a backup, make sure that the backup was NOT created during the period when you used the firmware related to the another release. For more info, see the* ***Firmware*** *page (the* ***System*** *group) in the manager web interface. The release number is first two digits of the product version, for example, 2.0, 2.2, etc.*

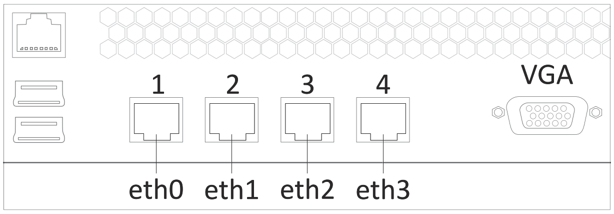
*How to restore and automatically download backups, read here:* ***System maintenance: Backup copies*** *on page* ***100***

# System configuration

## Network

This page displays the list of all network adapters installed on the system, including virtual. Each adapter has the individual panel in the page.

The adapters in the web interface are related to the network adapters on the front panel of NetUP streamer:




*The network adapter №1 on the front panel of NetUP streamer is the eth0 in the web interface, №2 – eth1, №3 – eth2, №4 – eth3*

The following actions are available on the page:

1. **Create a VLAN (virtual adapter)**
   Click *Add VLAN*. In the opened window select the *Network interface*, that you want to use for creating a virtual one, write the *VLAN ID* and *IP address/mask*, then click *Save*.

*The VLAN name will be composed of the physical interface name and the entered ID*

2. **Connect to IPTV Core**
   Click *Change Core IP*, then in the opened window, write *IP address* and click *Save* to connect to IPTV Core. As result, *in the IPTV Core web interface, on the Connections page*, should appear information about the connection to this server.

*Change Core IP button is only present on non IPTV Core servers*

3. **Assign IP Address to Adapter**
   Click *Add alias* on an adapter panel. In the opened window, write *IP address/mask* and click *Save*.

*The list of all IP addresses assigned to the adapter is displayed on the adapter panel in the Aliases column*

4. **Display adapter load statistics in graphic**
   Click *Statistics* on an adapter panel to see the statistic.
5. **Set the main interface**
   Left-click on the IP address (*Inet adress*) of an adapter. In the opened window check the *Main interface* box and click Save.

*The default main interface is eth0*

6. **Edit an IP-address or delete it**
   Left-click on the IP address (*Inet adress* or *Aliasses*) you want to edit. In the opened window change the IP address and click Save. You cannot delete Main IP or the last remaining IP address of the adapter.

*The address assigned for the main interface is used for the component's interaction (see* ***Connections*** *on page* ***48****) and thus is absolutely crucial for the system's operation. It can never be deleted*

7. **Change the IP addresses range served by the DHCP server**
   Left-click on the IP addresses range in the *DHCP server* column on the panel of an adapter. In the opened window specify the required range and, if necessary, add static addresses, then click *Save* to apply changes.
8. **Stop or start DHCP server**
   Click *UP / DOWN* on the panel of an adapter. In the opened window click *OK* to switch the server.

*The UP / DOWN button is also the DHCP server status indicator*

9. **Delete a VLAN**
   Click *Delete VLAN* on the panel of an adapter. In the opened window click *OK* to delete the selected adapter.

## Routing

This page displays *User routing rules* and *System routing table*.

The following actions are available on the page:

1. **Add a user routing rule**
   Click *Add rule,* then in the opened window, write *IP address/mask*, *Gateway,* select *Network interface* and click *Save*.

> *Automatic backup is made every day*

2. **Edit or delete a rule**
   Left-click on a rule. In the opened window make changes and click *Save* to apply them or click *Delete* to remove the rule.
3. **Show or hide the system routing table**
   Click on the *Show / Hide* button.

> *The system routing table is needed for correct system operation*

## Security

Use this page to change the access password.

> *Server admin password is used for SSH and FTP access*

## Services

This page displays the list of the system services and their statuses (*started* or *stopped*).

The following actions are available on the page:

1. **Start or stop a service**
   Left-click on a service name. In the opened window click *Start* or *Stop* to switch the service.

## Date and time

Use this page to set the server date and time, and select timezone. These features are only available for the IPTV Core.

The following actions are available on the page:

1. **Set time manually**
   Click *Set time,* then in the opened window write *Date* and *Time*, then click *Save*.
2. **Select timezone**
   Click Select. In the opened window, select timezone and click *Save*.

> *Set the correct timezone before uploading the license (see* ***Licence*** *on page* ***57****), otherwise the system may work incorrectly*

3. **Add an NTP server**
   Click *Add*. In the opened window write the address of an NTP server and click Save.
4. **Delete an NTP server**
   Left-click on the address of the server you want to remove and click Delete in the opened window.

*For each NTP server, you can see a synchronization status: **Filed** – the last sync attempt has failed; **SYNC** – the sync has been performed successfully; **Reserved** – this time server has not been used yet.*

## Licence

This page displays information about uploaded licenses (components, numbers, expiration dates and restrictions). Use this page to upload new licenses.

*Set the correct timezone before uploading the license (see **Date and time** on page **56**)*

*Make sure the new license is fully compatible with the old one before uploading it*

# Manager web interface

## Overview

The manager web interface is designed to handle user accounts, set up and attach service plans and services to customers.

To access the manager web interface, enter an **IP address of Middleware/manager** in your browser's address bar. On the opened page enter the login and the password specified in the equipment passport.

The left panel of the web interface contains links to settings pages, pages are organized into groups. The presence of pages and groups depends on the hardware configuration of the server and the privileges of the currently logged in system user.

The manager web interface can include:

| Group | Page | Function |
|---|---|---|
| **User** | Does not contain pages | Log out and go to the authorization page |
| **Customers** | **Customers** | Manage customers and their accounts |
| | **Customer groups** | Add and edit customer groups |
| **Billing** | **Service plans** | Manage service plans and services |
| | **Standalone services** | Manage standalone services |
| | **Media content groups** | Combine content in media groups |
| **Media content** | **Media groups** | Manage media groups |
| | **Languages** | Manage languages which used to describe content |
| **Accounting** | **Prepaid cards** | Manage prepaid cards |
| | **Accounting period** | Close accounting periods |
| **Security** | **Activation requests** | See received activation requests |
| **Reports** | **Debit** | Create and upload charge reports |
| | **Content view rate** | See a content view rate |
| | **Low balance customers** | See a low balance customers report |
| **Dictionaries** | **Banks** | Create the list of banks |
| **IPTV Distribution** | **Manage VoD content** | Upload and delete video, manage transcoding settings |
| **Video stream processing** | **Processing presets** | Manage processing presets for output streams |
| | **Processing setup** | Manage input and output streams |
| **System settings** | **System users** | Add users and manage privileges for them |
| | **SNMP + PA/GA** | Manage SNMP and Public Alert and General Alarm; |
| | **Currencies** | Add and delete currencies |
| | **Firmware** | Update firmware |
| | **Services** | Start and stop the services |
| | **Licence** | Download licenses |
| **Android client** | **STB messages** | Manage messages for STB users |

## User

This group doesn’t contain any pages. Use it to log out. Click *Logout* to go to the authorization page.

# Customers

## Customers

The following actions are available on the page:

1. **Add a customer**
   Click on the corresponding button, then select a customer type: *Individual* or *Organization.* In the opened window fill in the fields and click *Create.* As result, you can see the **Customer information page**
2. **Export activation codes**
   Click the menu icon and select the *Export activation codes.* The data will be downloaded as a CSV file.
3. **Find a customer**
   Select one of the possible search criteria (*Name, login, account ID, access card, contract number*) and enter in the search bar the value for this criteria. The results will be displayed on the same page.

> *In the list of personal accounts, the Customer column displays the full name of the individuals and the abbreviated name of the organization*

4. **Filter the list of customers**
   Select the values for one or both filters: *Personal account state* and *Customer group*. The results will be displayed on the page.

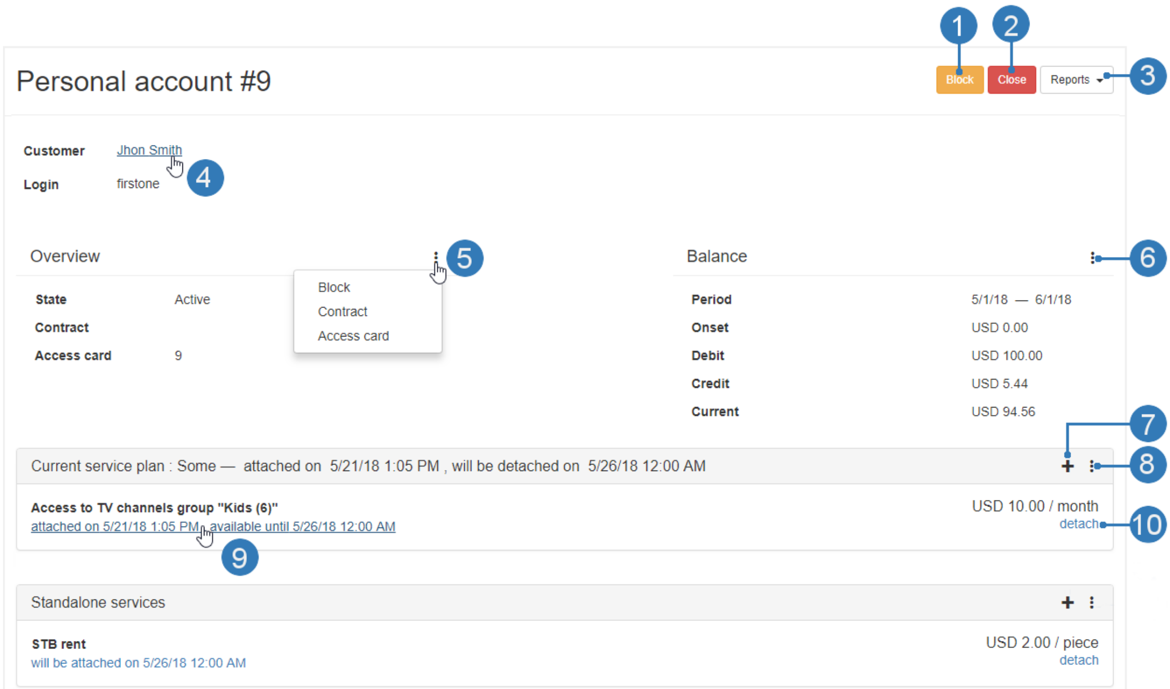
> *If a customer has a personal account, the Status column of the list displays Active, Blocked or Closed state for this customer*

5. **Sort the list of customers**
   Use corresponding elements to sort the list by *Customer ID or Personal account number*, ascending or descending order and also determine the number of customers that should be shown on one page.

> *When a customer does not have an account, the Account column in the list displays a dash.*
> *When a customer has several accounts, each one is placed in a separate row*

6. **See detailed information about a customer**
   Use sorting, filtering or search bar to find a customer and left-click on the line with the customer's data.
   If the customer has a personal account, you will jump to the **Customer's personal account page**. Left-click on the customer name to open the page with detailed information about the customer.
   If the customer does not have a personal account yet, you will immediately see the **Customer information page**.
   Read more about these pages below.

## Customer's personal account page




The following actions are available on the page:

1. **Block or unblock a personal account**
   Click on the corresponding button on the page. In the opened window specify the Start and End date of the block, if necessary, and confirm the action.

> *If the personal account is blocked, the page displays the* ***Unblock*** *button*

2. **Close a personal account**
   Click on the corresponding button on the page. In the opened window confirm the action of closing the account.
3. **Generate a report**
   Click on the Report button and select one of the available reports from the drop-down list: *Report on locks, Financial report* or *Attached services history.* Report data will be displayed in a separate window.
4. **Open the customer information page**
   Click on the customer name.
5. **Edit contract number and date**
   Click the menu icon on the *Overview* panel and select *Contract.* In the opened window modify the data and click *Save.*
   **Delete or generate an activation code (including PIN and license key)**
   Click the menu icon on the *Overview* panel and select *Access card.* In the opened window click *Delete* or *Generate activation code* on the *Activation codes* panel
6. **Make a payment**
   Click the menu icon on the *Balance* panel and select *Payment.* In the opened window fill in the fields and click *Save.*
   **Set an overdraft limit**
   Click the menu icon on the *Balance* panel and select *Overdraft limit.* In the opened window write the sum and click *Save.*
   **Adjust a customer balance**

Click the menu icon on the *Balance* panel and select *Adjustment.* On the opened page find a service or a payment you want to correct and left-click on it. In the opened window make changes and click *Save.*

7. **Attach a service**
   Click on the *Attach service* button on the *Current or Next service plan* panel or on the *Standalone services* panel. In the opened window, fill in the fields and click *Save.*
8. **Attach or detach a service plan**
   Click the menu icon on the *Current service plan* panel and select *Attach* or *Detach.* In the opened window fill in the fields and click *Save.*
   **Switch a service plan**
   Click the menu icon on the *Current service plan* panel and select *Switch*. In the opened window fill in the fields and click *Save.*

> *If you specify the Start date for the next service plan, the Next service plan panel will appear on the personal account page*

**See an attached services history**
Click the menu icon on the *Current or Next service plan* panel or on the *Standalone services* panel and select *History.* Attached services history will be displayed in a separate window.

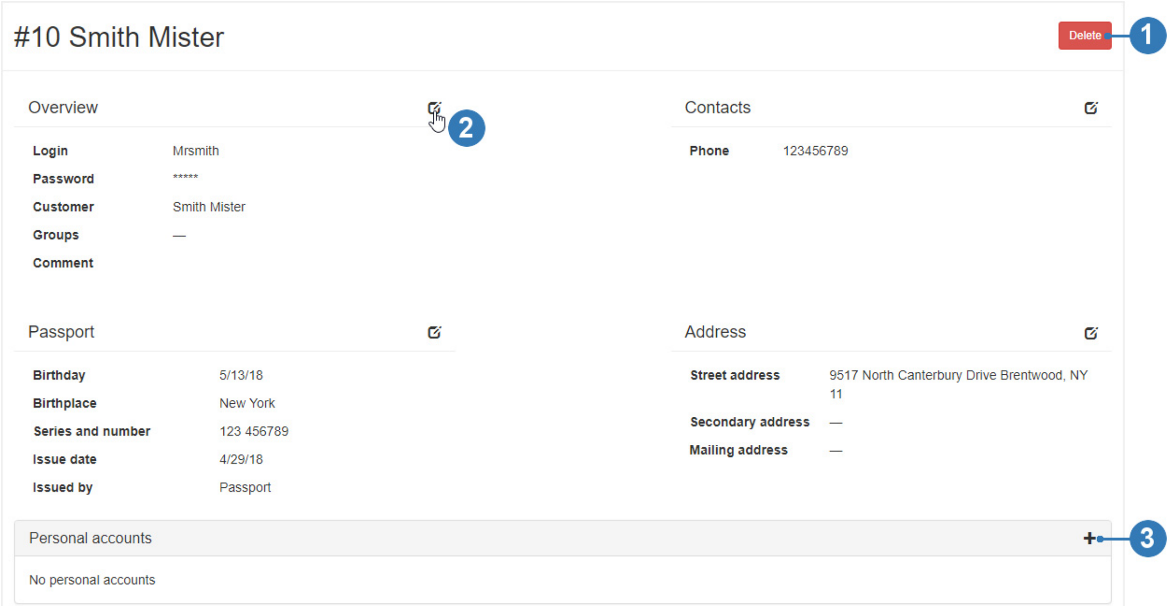
9. **Edit the End date of a service**
   Click on the date under a service on the *Current or Next service plan* panel or on the *Standalone services* panel. In the opened window make changes and click *Proceed.*
10. **Detach a service**
    Click on the corresponding button on the *Current or Next service plan* panel or on the *Standalone services* panel opposite the service you want to detach. Confirm the action in the opened window.

**To open a customer's personal account page:**
1. Open the **Customers** page.
2. Use filtering, sorting and search bar to find a customer.
3. Left-click on the customer's data:

   – if the customer has an personal account, you will see the **Customer's personal account page**;

   – if the customer does not have any personal account, you will see the **Customer information page**. Click on **Create a new personal account**. In the opened window write the Personal account number, if it necessary, select the currency and click **Create.**

## Customer information page




*The Customer information page for organizations has additional panels: the **Bank details** and **Contact persons**. The **Passport** panel is absent for organizations*

The following actions are available on the page:

1. **Delete a customer**
   Click on the corresponding button and confirm the deletion in the opened window.
2. **Edit a customer profile**
   Click *Edit* on the panel which displays data you want to modify. In the opened window make changes and click *Save*.
3. **Add a personal account**
   Click *Create a new personal account.* In the opened window select a currency and write a personal account number, if it's necessary, then click *Create.*

*Personal account number is created automatically. For the hotel solutions the personal account number must match the room number, so you need to write it manually*

*If the list does not have the currency, you need to add it on the Currencies page (for more info, see* ***Currencies*** *on page* ***77****)*

**To open a customer's information page:**

1. Open the **Customers** page.
2. Use filtering, sorting and search bar to find a customer.
3. Left-click on the customer's data:
   - if you see the **Customer's personal account page**, left-click on the customer name to open the page with detailed information about the customer;
   - if the customer does not have any personal account, you will immediately see the customer information page.

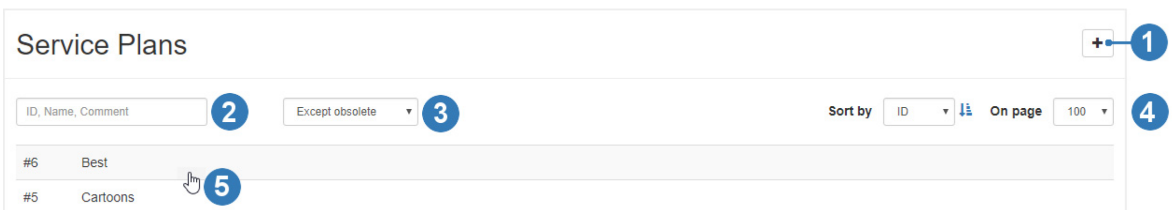
## Customer groups


The following actions are available on the page:

1. **Create a customer group**
   Click on the corresponding button on the page. In the opened window enter the Name and click *Create.*
2. **Edit a group name**
   Left-click on the group name you want to modify. In the opened window, make changes and click *Save.*

# Billing

## Service plans



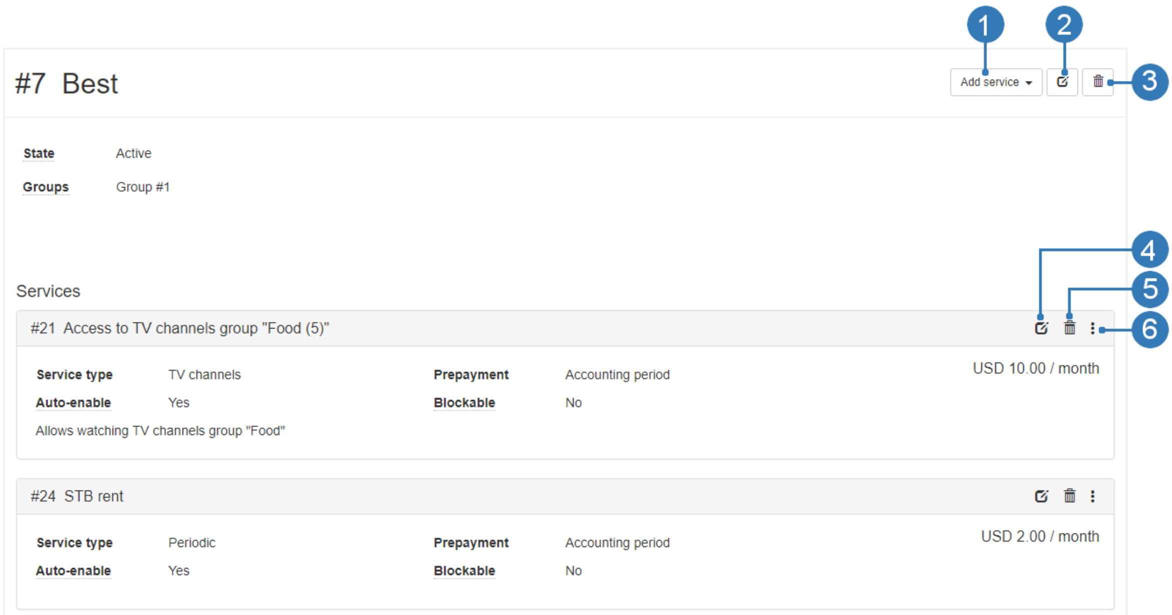

The following actions are available on the page:

1. **Create a service plan**
   Click on the corresponding button on the page. In the opened window fill in the fields and click *Create.* After that, you will automatically get to the **Service plan page**

*For more info, see the* ***Service plans*** *on page* ***12****and* ***Create a service plan*** *on page* ***22***

2. **Find a service plan**
   Enter *ID, Name of the service plan or Comment* in the search bar and the search results will be displayed on the page.
3. **Filter the list of service plans**
   Select the *State* of a service plan (for more info, see **Basic objects and processes: Service plans** on page **12**) and the results will be displayed on the page.
4. **Sort the list of service plans**
   Use corresponding elements to sort the list by *ID or Name*, ascending or descending order, and also determine the number of service plans that should be shown on one page.
5. **See detailed information about a service plan**
   Use sorting, filtering or search bar to find a service plan and then left-click on the line with its data to open the service plan page.

## Service plan page




The following actions are available on the page:

1. **Add a service to a service plan**
   Click on the corresponding button and select a service type from the drop-down list. In the opened window, fill in the fields and click *Save*. After that, the service will appear at the bottom of the page as a separate panel. For more info, see **Services** on page **10**
2. **Edit a service plan**
   Click on the corresponding button on the page. In the opened window make changes and click *Save.* For more info, see **Service plans** on page **12**.
3. **Delete a service plan**
   Click on the corresponding button and confirm the deletion in the opened window.

> *You can not delete the service plan that was attached to at least one customer. Change the state of a service plan to “Obsolete” if you want it not be attached to customers*

4. **Edit a service**
   Click on the corresponding button on the panel of the service you want to modify. In the opened window, make changes and click *Save.*
5. **Delete a service**
   Click on the corresponding button on the panel of the service you want to remove. In the opened window confirm the deletion.

> *You can not delete the service that was attached to at least one customer*

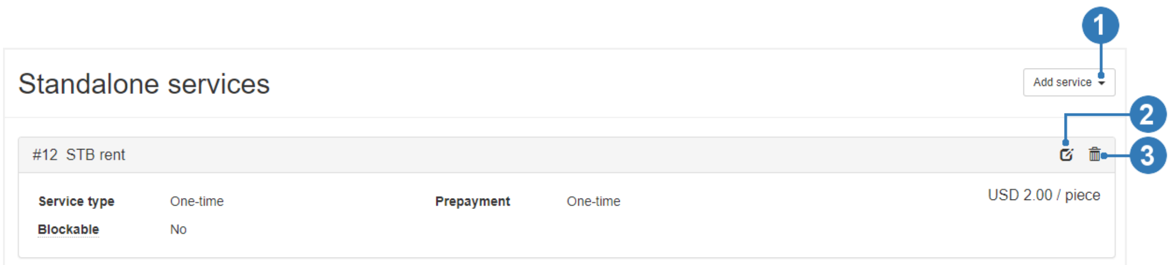
6. **Enable or disable a service for multiple personal accounts**
   Click on the menu icon on the panel of the service you want to enable or disable for a customer group, and select the corresponding item. In the opened window, fill in the fields and click *Save.*

> *You can attach or detach the service to the customer group, if the service plan that includes this service has been attached to the selected customer group*

**To open the service plan page:**

1. Open the **Service plans** page.
2. Use filtering, sorting and search to find a service plan.
3. Left-click on the line with the service plan data.

## Standalone services

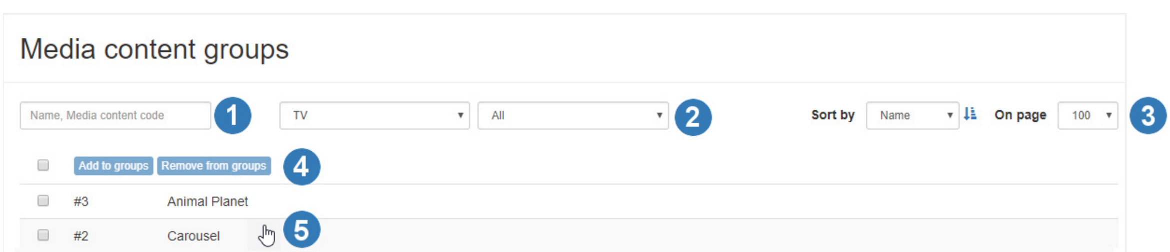



The following actions are available on the page:

1. **Add a service**
   Click on the corresponding button and select a service type from the drop-down list. In the opened window fill in the fields and click *Save.* After that, the service will appear at the bottom of the page as a separate panel.
2. **Edit a service**
   Click on the corresponding button on the panel of the service you want to modify. In the opened window, make changes and click *Save.*
3. **Delete a service**
   Click on the corresponding button on the panel of the service you want to remove. In the opened window confirm the deletion.

*You can not delete the service that was attached to at least one customer*

## Media content groups




The following actions are available on the page:

1. **Find a media content**
   Enter a *Name or Media content code* in the search bar and the search results will be displayed on the page.
2. **Filter the list of media content groups**
   Select the values for one or both filters: *Media content type (Movies, TV, Radio)* and *Name of media content group*. The results will be displayed on the same page.
3. **Sort the list of media content groups**
   Use corresponding elements to sort the list by *Name or Media content code*, ascending or descending order, and also determine the number of service plans that should be shown on one page.
4. **Add media content to groups or remove it from groups**
   Use sorting, filtering or search bar to find a media content and mark it (check a box), then click on the *Add to*

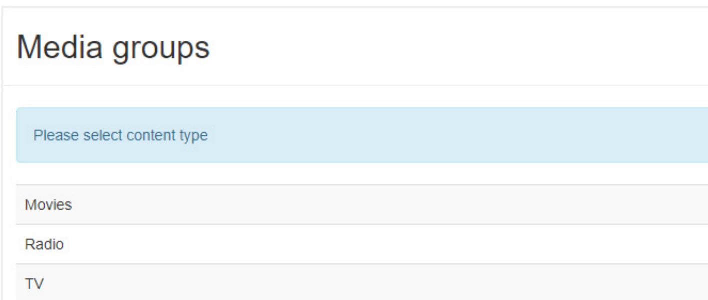
*groups or Remove from groups.* In the opened window add or remove media groups and click on the *corresponding button* to confirm the action.

*You can add a media content via the web interface on the following pages: **TV Channels** on page **42**, **Radio** on page **43** and **Movies** on page **43***

5. **Edit the list of media content groups for one media content**
Use sorting, filtering or search bar to find a media content for which you want to edit the list of groups and click on the line with the media content data. In the opened window delete / add groups and click *Save*.

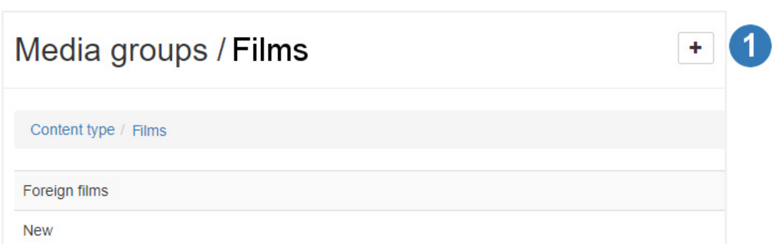
# Media content

## Media groups



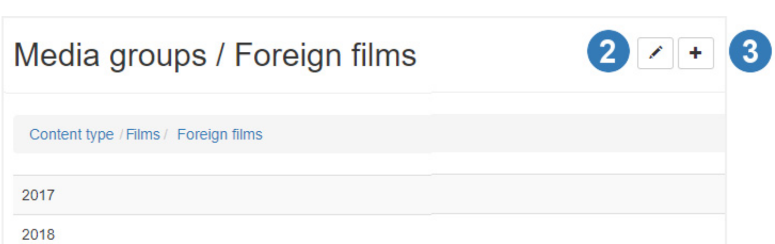

The following actions are available on the page:

1. **Create a new media group**
Left-click on one of the available media content types *(Movies, Radio, TV)* and click on the corresponding button on the opened page. In the opened window write a group name and click *Save.*



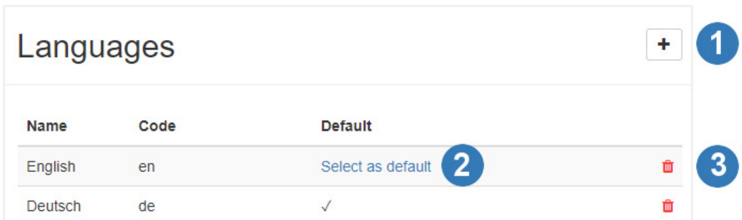

*You can not delete a media group, you can only edit its name*

2. **Edit a media group name**
Left-click on the media group you want to modify and click on *Edit media group name* on the opened page. In the opened window make changes and click *Save.*



3. **Create a subgroup**
   Left-click on the media group for which you want to create a subgroup. On the opened page click *Create new media group*. In the opened window write a media group name and click *Save*.

## Languages

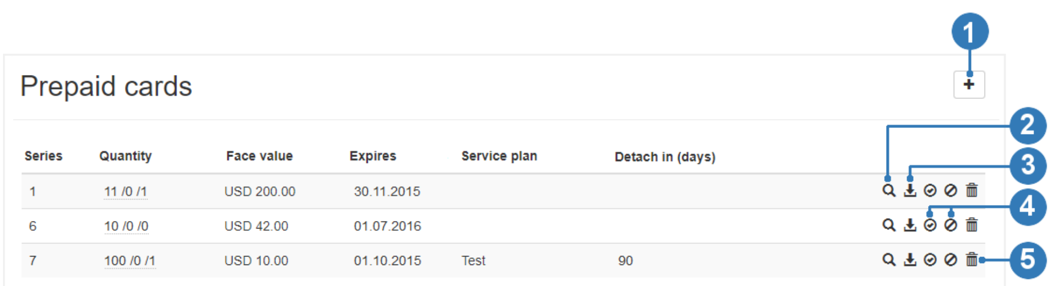



This page contains the list of languages that can be used to describe content.

The following actions are available on the page:
1. **Add a language**
   Click on the corresponding button on the page. In the opened window select a language and click *Save.*
2. **Select the default language**
   Click on the corresponding button next to the language you want to set as the default language, and confirm the change in the opened window.
3. **Delete a language**
   Click on the corresponding button next to the language you want to remove, and confirm the action in the opened window.

# Accounting

## Prepaid cards

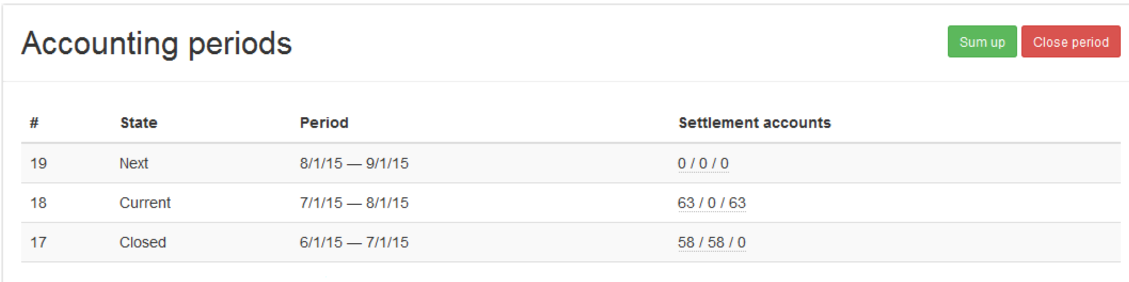



The following actions are available on the page:
1. **Create prepaid card series**
   Click on the corresponding button on the page. In the opened window fill in the fields and click *Create.*
2. **Find a card by its number**
   Click on the corresponding button. In the opened window write a card number and click *Search.*
3. **Export to CSV**
   Click on the corresponding button and the data will be downloaded as a CSV file.
4. **Unblock or block series**
   Click on the corresponding button and click *Unblock or Block* in the opened window.

> *If you want unblock or block one card: 1)use the search to find it; 2) click Unblock or Block in the opened window*

5. **Delete series**
   Click on the corresponding button and then click *Delete* in the opened window.

## Accounting period




The following actions are available on the page:

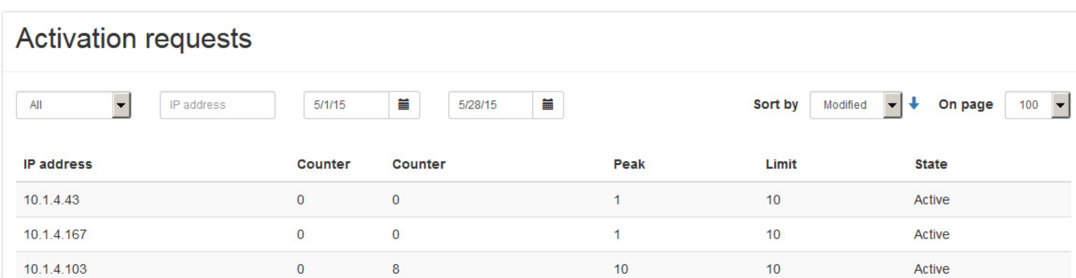
1. **Sum up**
   Click on the corresponding button on the page to prepare financial documents for old accounting periods.
2. **Close period**
   Click on the corresponding button if the list contains one or more accounting periods which have the *Old* state.

*Each accounting period is automatically closed at the end of the period. If for some reason this does not occur, its state changes to* ***Old***

*These actions are executed for all accounting periods in the* ***Old*** *state*

# Security

## Activation requests



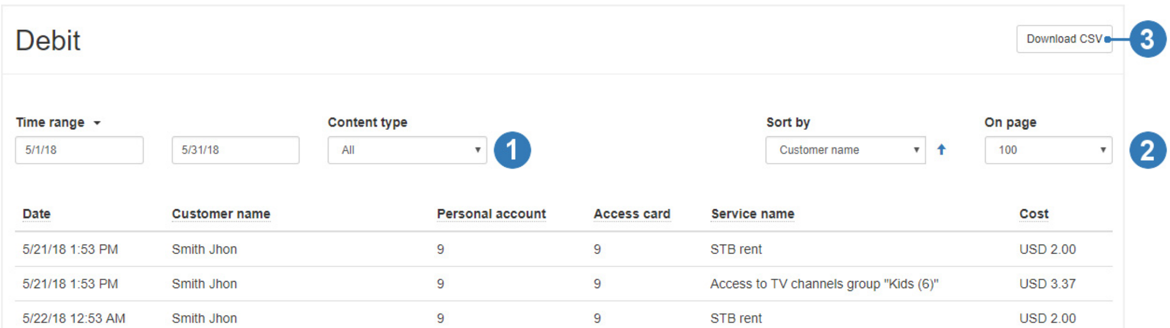

The following actions are available on the page:

1. **Find a request by its IP address**
   Enter the IP address in the search bar and the page will display all requests sent from it.
2. **Filter the list of requests**
   Select values for following filters: *Request state* and / or *Time range*. The results will be displayed on the same page.
3. **Sort the list of requests**
   Use corresponding elements to sort the list by *Modified or IP address*, ascending or descending order, and also determine the number of requests that should be shown on one page.

4. **Reset the counter of activation requests**
   Left-click on an IP address for which you want to reset the counter. In the opened window change the state to *Active* and the counter value to zero, then click *Save*.

# Reports

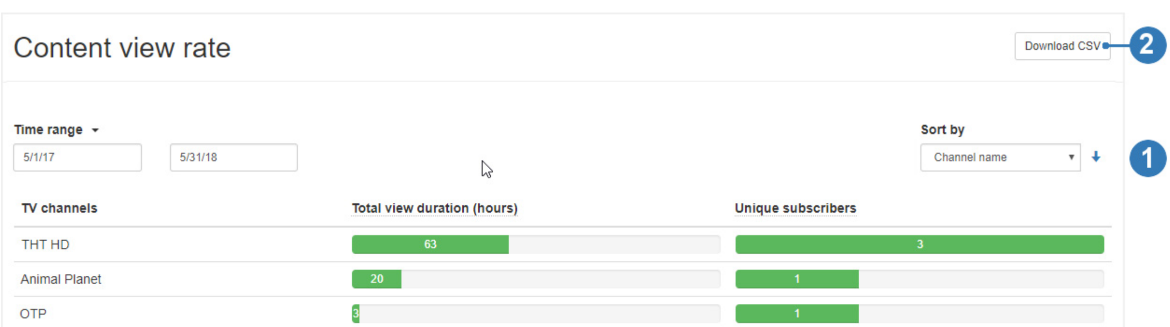
## Debit




The following actions are available on the page:

1. **Generate a report**
   Select values for following filters: *Time range and Content type.* The results will be displayed on the page.
2. **Sort items in a report**
   Use corresponding elements to sort items by *Date, Customer name or Cost*, ascending or descending order, and also determine the number of items that should be shown on one page.
3. **Download a report as a CSV file**
   Use filters to generate a report and then click on the corresponding button on the page. The data will be downloaded as a CSV file.

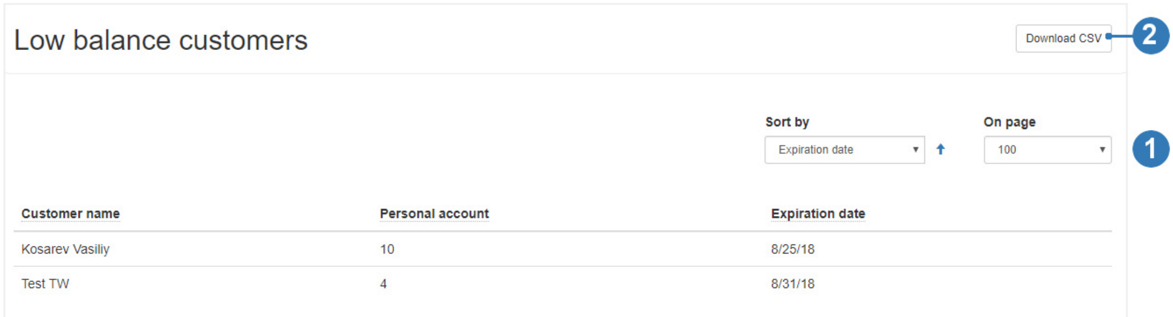
## Content view rate




The following actions are available on the page:

1. **Generate a report**
   Select *Time range* for the report and use corresponding elements to sort TV channels by *Viewing rate, Unique subscribers or Channel name*, and also ascending or descending order. The results will be displayed on the same page.
2. **Download the report as a CSV file**
   Use filters to generate the report and then click on the corresponding button on the page. The data will be downloaded as a CSV file.

## Low balance customers

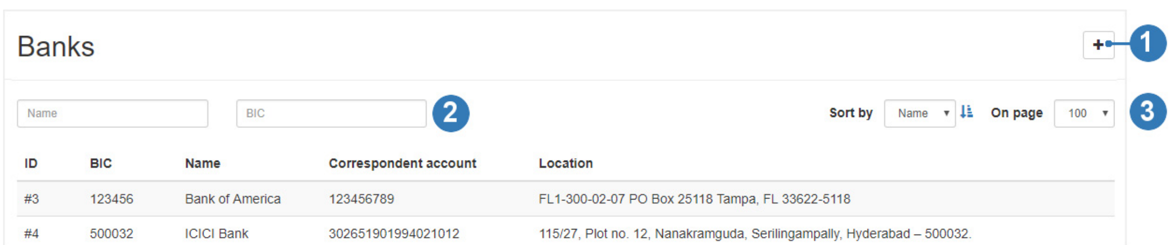



The following actions are available on the page:

1. **Sort items in a report**
   Use corresponding elements to sort the list by *Expiration date or Customer name*, ascending or descending order, and also determine the number of items that should be shown on one page.
2. **Download the report as a CSV file**
   Click on the corresponding button on the page and the data will be downloaded as a CSV file.

# Dictionaries

## Banks




The following actions are available on the page:

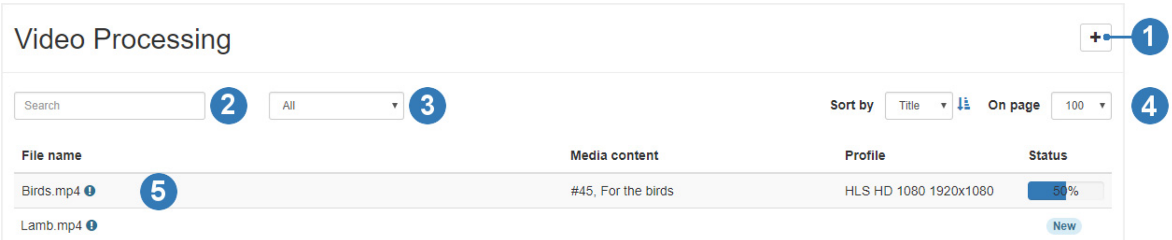
1. **Create a bank**
   Click on the corresponding button on the page. In the opened window fill in the fields and click *Create.*

> *Add a bank to simplify the filling of bank details when you are creating an customer as an organization*

2. **Find a bank**
   Enter the *Name* and / or *BIC* of a bank in the search bar. The results will be displayed on the same page.
3. **Sort the list of banks**
   Use corresponding elements to sort the list by *ID, BIC, Name*, ascending or descending order, and also determine the number of banks that should be shown on one page.
4. **Edit bank details or delete a bank**
   Use sorting, filtering or search bar to find a bank, then click on the line with the bank data. In the opened window make changes and click *Save* or click *Delete*, to remove the bank.

# IPTV distribution

## Manage VoD content



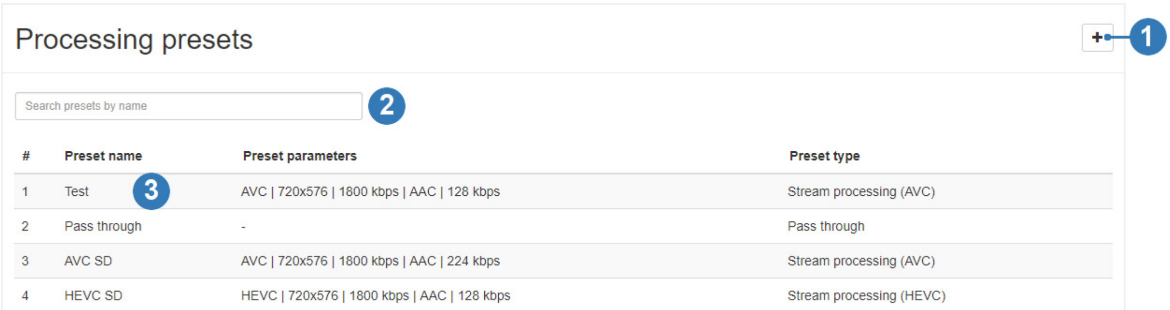

The following actions are available on the page:

1. **Upload video files**
   Click on the corresponding button on the page. In the opened window select the files you want to load, or drag the files into the window. The download will start automatically. When the download is complete, close the window. Uploaded files will appear in the list.
2. **Find a video**
   Enter the *File name* in the search bar and the search results will be displayed on the page.
3. **Filter the list of video**
   Select the *Status* of a video and the results will be displayed on the page.
4. **Sort the list of video**
   Use corresponding elements to sort the list by *Title or State*, ascending or descending order, and also determine the number of video that should be shown on one page.
5. **Transcode or delete a video**
   Use sorting, filtering or search bar to find a video, then click on the line with its data. In the opened window fill in the fields and click *Transcode* to process the video or click *Delete* to remove the video.
   If the file was processed earlier, the *Reset* button will be displayed in the window. Reset the transcoding settings and process the file again if necessary.

*In the web interface, open the Movies page and find the media content which was created in the transcode process there. Open it and add information about the video (name in different languages, description, logo, etc.). If you create a media content before transcoding, the media content will be displayed in the drop-down list in the Transcoding window (see* ***Usage examples: Create a VOD content (a video, a movie)*** *on page* ***20****)*

# Video stream processing

## Processing presets




The following actions are available on the page:

1. **Add a preset**
   Click on the corresponding button on the page. In the opened window select processing parameters you want to store in the preset and click *Save.*

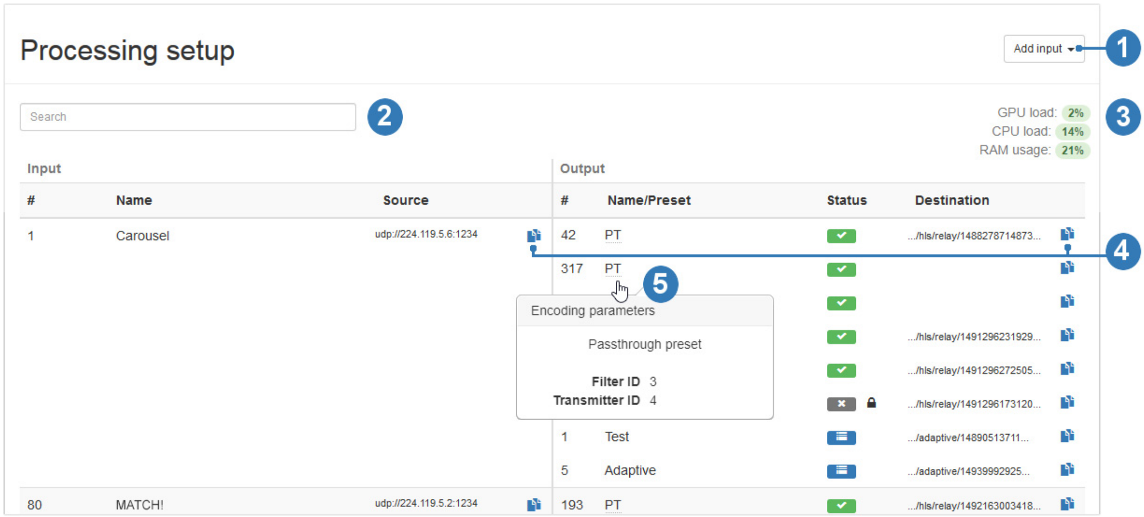
> *Presets are classified into the following types:* ***Pass through*** *(pass the stream as is, without processing),* ***Stream processing AVC, HEVC*** *or* ***MPEG-2****. For all preset types except Pass through, you can configure video and audio processing parameters*

2. **Find a preset**
   Enter the *preset name* in the search bar and the search results will be displayed on the page.
3. **Edit or delete a preset**
   Left-click on the line with preset data you want to edit or delete. In the opened window change parameters and click *Save* or click *Delete* to remove the preset.

> *You can not change the preset type*

> *Changing parameters does not affect output streams that were configured using this processing preset. A set of preset settings is used only to quickly fill out web forms*

## Processing setup




The following actions are available on the page:

1. **Add input**
   Click on the corresponding button and select one of the options – *from NetUP Streamer, from network video stream or from file.* In the opened window, fill in the fields and click *Save.* After adding the stream, you automatically get to the **Manage output streams page**

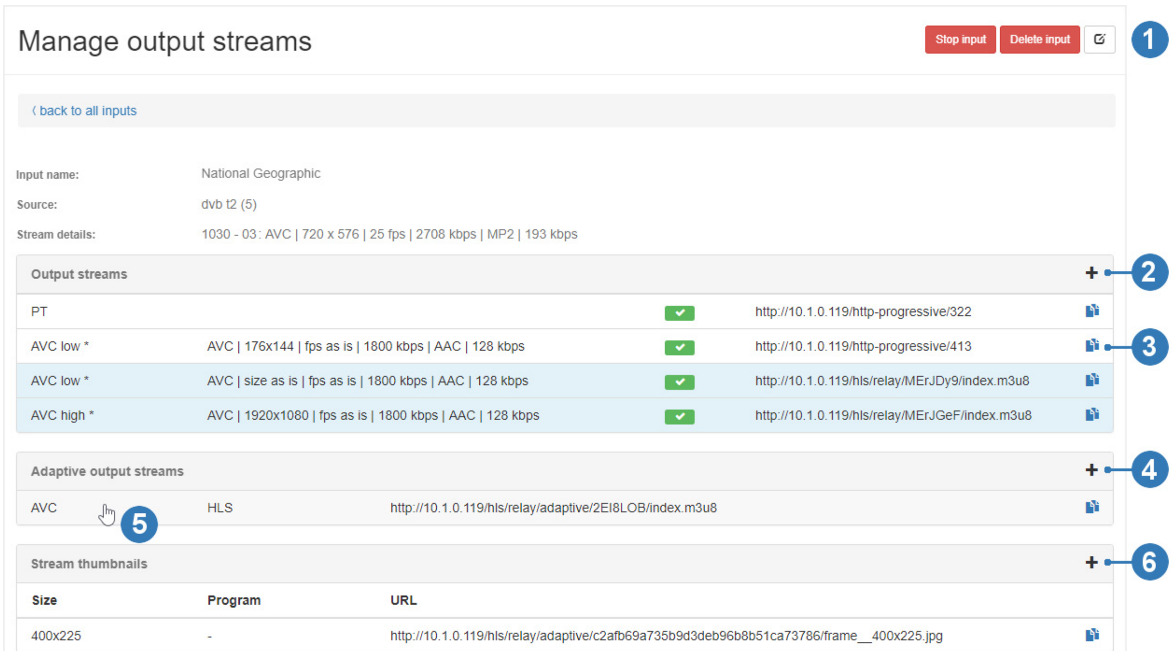
> *Connect to the server via SSH and upload the video file to /netup/playlist/ before adding a stream from the file*

2. **Find an input**
   Enter the input name in the search bar and the search results will be displayed on the page.
3. **See a transcoder load**
   The transcoder load is displayed in the upper right part of the page.
4. **Copy an input or output address**
   Click on the corresponding button next to a stream address. Data will be automatically copied to the clipboard.
5. **See encoding parameters**
   Hover the mouse over an output name to show the pop-up window that contains transcoding parameters for the output.
6. **See a status of an output**
   – Started
   – Stopped
   – Error
   – Adaptive stream
   – Encrypted stream
7. **Stop input, delete it or edit its parameters**
   Left-click on the line with an *input data* to open the Manage output streams page (read the description of this page in the next section). In the upper-right corner click one of the following buttons:
   - *Stop input* to stop broadcasting all output streams configured for this input;
   - *Delete input* to remove the input;
   - *Edit input stream* to make changes.
8. **Manage output streams**
   Left-click on the line with an *output data.* In the opened window make changes and click *Save* or *Delete* to remove

the output stream.
You can *Stop output stream* (excluding an adaptive). Left-click on the line with an output data and click corresponding button in the opened window.

*When the output stream is stopped, the interface displays the Start output button. Click on the button to restart broadcast*

## *Manage output streams page*




The following actions are available on the page:

1. **Stop an input, delete an input stream or edit its parameters**
   Click on the corresponding button on the page to stop the input. If you stop the input, the broadcast of all output streams configured for this input will also be stopped.

*When the input is stopped, the interface displays the Start input button. Click on the button to restart input. Restarting the input, you are restoring the broadcast of all output streams that worked before the input was stopped*

   Click on the corresponding button to delete the input stream and confirm the action in the opened window.
   Click *Edit input stream* to change its parameters, then make changes and click *Save* in the opened window.

2. **Add an output stream**
   Click on the corresponding button on the page. In the opened window fill in the fields and click *Save*. The new stream will displayed on the *Output streams* panel (more info **Usage examples: Set up transcoding** on page **29**)

*While adding the output stream, you can change processing settings on Video and Audio tabs. These changes do not affect the preset.*
*Video and Audio tabs are available for all the preset types, except Pass through (pass the stream as is with no processing)*

3. **Copy an output stream address**
   Click on the corresponding button next to a stream address. Data will be automatically copied to the clipboard.

4. **Add an adaptive output stream**
   Click on the corresponding button on the page. In the opened window select streams you want to include in the adaptive stream, then click *Save*. The new adaptive stream will be displayed on the *Adaptive output streams* panel.

> *Before creating an adaptive stream, add the required number of output HLS streams which should be included in it. Use the corresponding button on the Output streams panel to add streams*

5. **See the output streams included in an adaptive stream**
   Hover the mouse over an adaptive stream and the streams that are included in it will be highlighted on the *Output streams* panel.
6. **Add a thumbnails stream**
   Click on the corresponding button on the page. In the opened window specify the Thumbnail size and click *Save*. The new thumbnails stream will be displayed on the *Stream thumbnails* panel.

> *The thumbnails with default size are used in the NetUP Android IP STB interface.*
> *Turn on the Use custom size option and select the Thumbnail size from the drop-down list or select 'Custom' and enter a resolution*

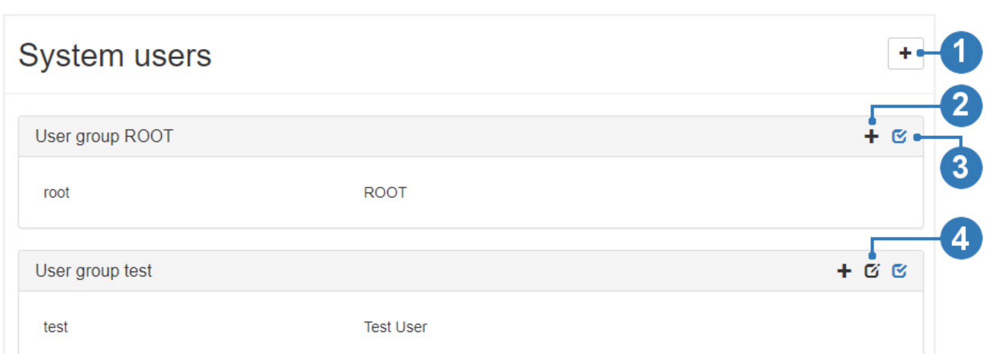
> *Thumbnails are used in the TV channels menu, in the STB interface. If you do not add the thumbnails stream for an input, the STB menu will display a TV channel logo*

7. **Edit parameters of an output, delete or stop it**
   Left-click on the line with an *output data* (including an adaptive and a thumbnails streams). In the opened window make changes and click *Save* or click *Delete* to remove the output stream.
   You can *stop an output stream* (excluding an adaptive and a thumbnails streams). Left-click on the line with an output data and click corresponding button in the opened window.

> *When the output stream is stopped, the interface displays the Start output button. Click on the button to restart broadcast*

# System settings

## System users



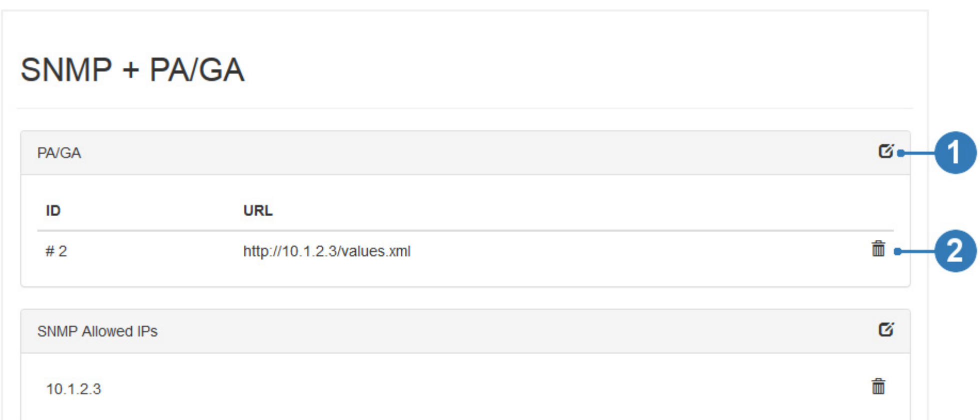

The following actions are available on the page:

1. **Create a new user group**
   Click on the corresponding button on the page. In the opened window write a group name and click *Create.*

*System users are created as members of system user groups. Each system user group has its own set of privileges*

2. **Create a new user**
   Click on the corresponding button on the panel of the group to which you want to add a user. In the opened window fill in the fields and click *Create.*
3. **Edit privileges**
   Click on the corresponding button on the panel of the group for which you want to set privileges. On the opened page check the boxes opposite the privileges you want to grant the user group and click *Save.*
4. **Edit a group name**
   Click on the corresponding button on the panel of the group for which you want to edit the name. In the opened window make changes and click *Save.*
5. **Edit user data or delete a user**
   Left-click on the line with the user data. In the opened window make changes and click *Save* or click *Delete* to remove the user.

## SNMP + PA/GA




This page contains an interface for setting up interactions over SNMP and setting up services shutdown in case of a Global Alarm. After receiving such a signal, the system will stop its components, until the alarm signal turns off.

The following actions are available on the page:

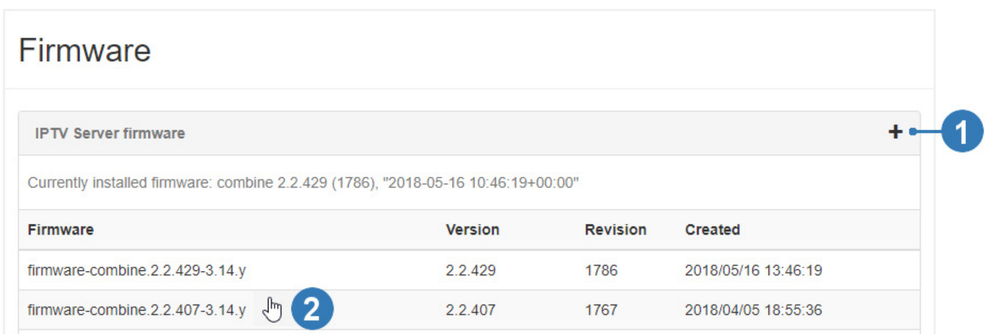
1. **Add or edit an item**
   Click on the corresponding button on the page. In the opened window fill in the fields and click *Save.*
2. **Delete an item**
   Click on the corresponding button in the line with the item you want to delete. In the opened window click *Delete* to remove the item.

## Currencies


The following actions are available on the page:

1. **Add a currency**
   Click on the corresponding button on the page. In the opened window select a currency from the drop-down list and click *Add.*
2. **Delete a currency**
   Click on the corresponding button in the line with the currency you want to delete. In the opened window click *Delete* to remove the currency.

## Firmware




The following actions are available on the page:

1. **Upload a firmware**
   Click on the corresponding button on the page. In the opened window select the files you want to load, or drag the files into the window. The download will start automatically. When the download is complete, close the window. Uploaded files will appear in the list.
2. **Install or delete a firmware**
   Left-click on the line with the firmware you want to install or delete. In the opened window click *Install* or *Delete* to remove the firmware from the list.

*Firmware of different versions of the NetUP.tv system may not be consistent with each other.*
*If you need to return and use the firmware related to previous releases, contact the NetUP technical support department*

*Older firmware versions can be uploaded and will be shown in the list, but can't be installed*

## Services

This page displays the list of the system services and their statuses (*started* or *stopped*).

*Left-click on a service name. In the opened window click Start or Stop to switch the service*

## Licence

This page displays information about uploaded licenses (components, numbers, expiration dates and restrictions). Use this page to upload new licenses.

*Set the correct timezone before uploading the license (see* ***Web interface: Date and time*** *on page* ***56****)*

*Make sure the new license is fully compatible with the old one before uploading it*

# Android client

## STB messages

This page displays the list of the STB messages on the current date.

*Select the date and then click Create message. In the opened window select a customer or a customer group, write a message and click Create*

# NetUP.tv Android client

## Setup

Starting from version 1.9, the NetUP.tv client is installed as a *default launcher* for NetUP Android IP STB. If necessary, the NetUP.tv client can be installed on Android set-top boxes from other manufacturers.

Follow these steps to install the NetUP.tv client:

- upload *.apk file to a flash drive and connect it to an STB. Before that, allow the installation of applications from external flash-drives in the STB settings;
- install NetUP.tv client and allow it to run as a default launcher.

## First launch

At first launch, you have to activate an STB. Follow these steps to do it:
1. Select a language in the menu.
2. Select one of the NetUP.tv client mode:
   - **Internet TV** – the set-top box is connected to the provider's IPTV middleware server over the Internet;
   - **Local TV** – the set-top box is connected to an IPTV middleware server available in the provider's local network;

> *For correct operation of the system in the Local TV mode the Middleware server must be used as its DNS server. If a different DNS server is used, it must be set up to resolve the.iptv zone to the Middleware address, and also to include it in the list of default suffixes for substitution*

   - **Free mode** – there's no connection to an IPTV middleware server.
3. Enter the activation data:
   - if you select 'Internet TV', you should enter the provider ID (it is assigned by NetUP), the card number and PIN which are stored in the customer account (for more info, see **Customer's personal account page** on page **60**);
   - if you select 'Local TV', you should enter the card number and PIN which are stored in the customer account;
   - if you select 'Free mode', you should not enter any data and can immediately go to the main menu.

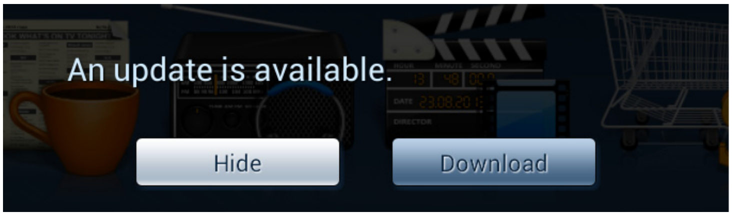
After successful activation and the next time you turn on the device, the STB loads the main interface screen that displays the main menu and the home page .

> *You can activate an STB using customer's login and password. Open the **Settings** page in the web interface (the **Android client** group) and turn on the `Activate STB with login/password` flag (for more info, see **Web interface: Settings** on page **50**)*

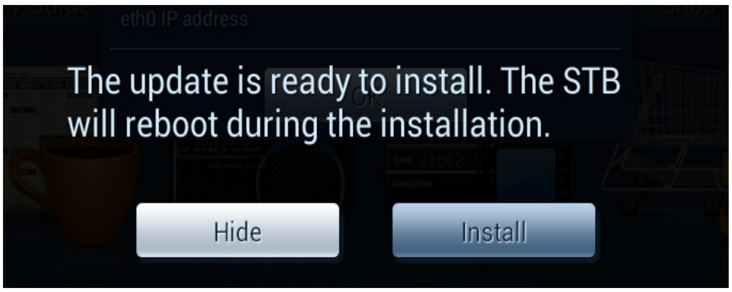
> *If the activation number has been entered incorrectly 10 times, further attempts will be blocked for 1 hour. You can retry after the requests counter is automatically reset or you can reset it manually (for more info, see **Usage examples: Reset the counter of activation requests** on page **26**)*

# Automatic firmware update

An automatic firmware update is available for NetUP Android IP STBs. An STB checks for updates when it is turned on or 1 hour after the previous check. If an update is available, it shows the following notification:




When the download is complete, it shows the following notification:




Before starting an update, the STB will reboot, and after installation, the device will operate as usual.

# Update firmware from a storage device

1. Upload a firmware file to a storage device in the root directory.
2. Connect it to an STB, then go to the **Apps** menu and run the **Upgrade** application.
3. Select the firmware update file in the **Local Update**.

*If the firmware file is uploaded to the root directory of the storage device, but it is not displayed in the file list, press the Menu button on the remote control 9 times*

4. After installation, the STB will reboot.

*If the STB does not boot and is stuck at start screen after an update, try reinstalling Firmware in the Recovery mode (: **Firmware upgrade in recovery mode** on page **HIDDEN**)*

# Update firmware from the Middleware server

1. Connect to the Middleware server via ftp. Use *custom_firmwares* as login.
2. Go to the **android** directory and create the *Amlogic-stvs9* directory or the *Amlogic-p2121113* directory. The directory name depends on the STB model used.
3. Upload the firmware file to the created directory.
4. Press the **Menu** button on the remote control and select **Check for updates.** Then press **Upload** and **Install** to set up the firmware.
5. Before starting an update, the STB will reboot, and after installation, the device will operate as usual.

# General features of the NetUP.tv Android client

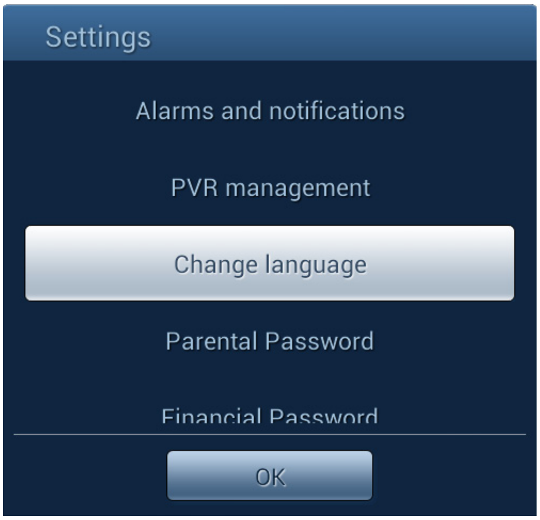
Turn on an STB and you will see the main interface screen of the NetUP.tv client. The upper part of the screen displays *date, time and network status.* The main part of the screen is the *home page*. Use the web interface to configure and edit the home page (for more info, see **Web interface: Home page** on page **50**). The bottom part of the screen displays the *main menu* which can be also configured and edited via the web interface (for more info, see **Web interface: Main menu** on page **51**).


The main menu can include following items:

- **TV channels**– the list of TV channels
- **TV guide**– a TV guide (EPG)
- **Radio**– the list of available radio channels
- **Movies**– the list of purchased media content
- **Shop**– the list of media content and services that can be purchased
- **Applications**– the list of available Android applications
- **Account**– account information (financial operations, current and next service plans, etc.)
- **Info**– the page with additional information

*The names of the main menu items, their number and order depend on the configuration of the NetUP.tv system and the settings saved in the web interface on the Main menu page*

Click the **Menu** on the main interface screen to open the *additional menu*. This menu contains following items:




- **Alarms and notifications** – opens the page where you can manage alarms or delete notifications. For more info about adding notifications, see **Alarms and notifications** on page **89**
- **PVR management** – opens the page for managing PVR recordings (watch or delete a video). How to record a video, see **TV guide** on page **85**
- **Change language** – opens the page where you can select a language for the interface (this section can be added to the main menu)
- **Parental password** – opens the page where you can set a password for watching adult content (determined by the name of the content genre). The password must be entered before playing back content
- **Financial password** – opens the page where you can set a password for any financial transactions (purchase of content, change of service plan, etc.)
- **Check for updates** – allows you to check for updates manually

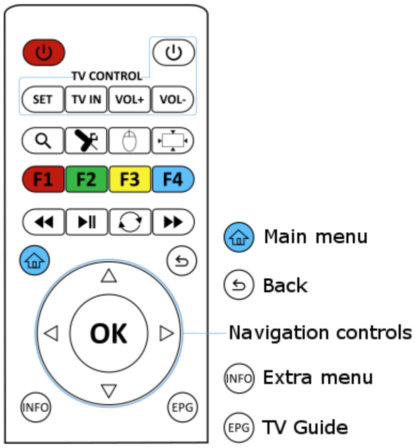
*Automatic check is performed once an hour*

- **System settings** – opens the page with Android system settings
- **Logout** – allows you to log out of the account. This item is displayed if an STB was activated using the login and password

*If you have been logged out, the next time you turn on the STB, you need to select the NetUP.tv client mode and enter the login and the password to connect the device*

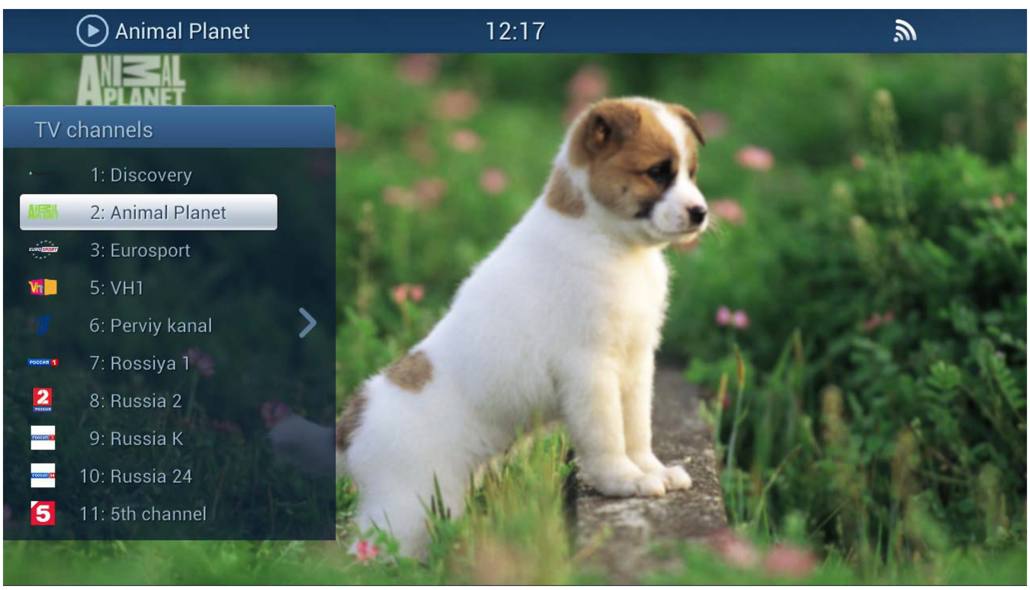
- **System data** – displays the firmware version, IPTV Launcher version, STB model and IP address

Use the STB remote control to navigate through the menu items. Use **Up / Down, Left / Right** and **Back** buttons to select a menu item. Press **OK** to move to the selected item. For example, you can use following buttons on the NetUP Android IP STB remote control to navigate:




# TV channels

The **TV channels** page displays the list of available TV channels. The list of TV channels depends on the customer's service plan (see **Usage examples: Create a service plan** on page **22**).




Press **Right** on the remote control to maximize the list. Use navigation buttons to select a channel and press **OK** to switch to it.

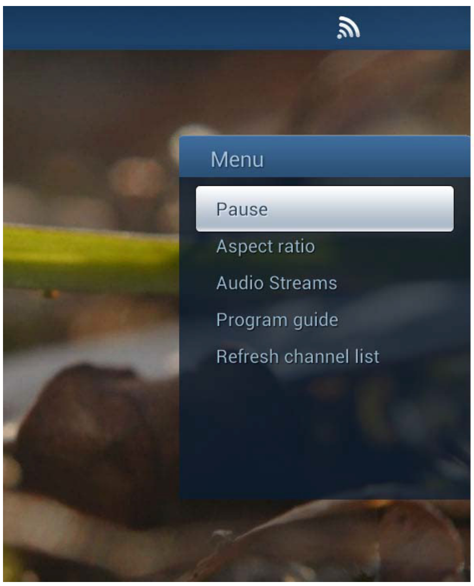
If a number has been assigned to the channel in the web interface (the Number field is filled in the TV channel profile), enter this number using the number keys on the remote control (see **Usage examples: Add a TV channel** on page **18**).

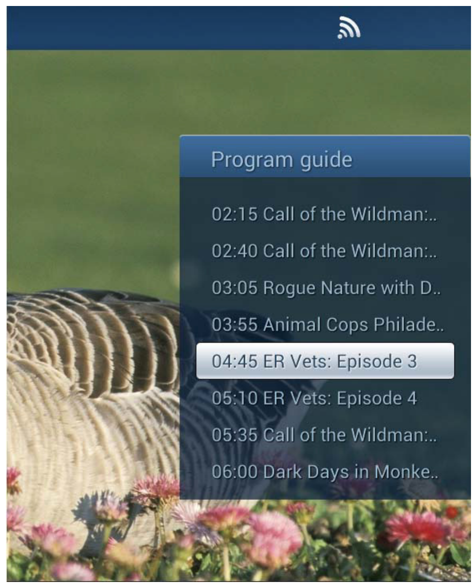
Press **INFO** during playback to show the TV playback menu. This menu contains following items:

- **Pause** – pause the playback. It automatically starts recording the video stream and starts playing back the recorded piece when the TV channel is unpaused. During playback of the recording, you can pause the channel again, as well as rewind forward or backward within the recorded fragment.
  Press **Back** on the STB remote control to return to watching the TV channel in real time

> *You must connect an external USB drive or SD memory card to the set-top box to use this feature. The capacity of the external drive should be at least 16 Gb*

- **Aspect ratio** – adjust the aspect ratio
- **Audio streams** – choose an audio stream
- **Program guide** – open the window with a TV guide, where you can find what's coming next on the current channel
- **Refresh channel list**



# TV guide

The **TV guide** page displays program guide for those channels for which it is available. Upload the program guide via the web interface if you want it displayed on this page (see **Usage examples: Upload a program guide (EPG)** on page **19**).


Use navigation buttons to select a channel and a program, then press **OK** to switch to the program.

*If an 'Access to records of TV channel' service is attached to a customer, the customer can select and watch recordings from this channel*

The channel included in the *Access to records of TV channel* service has a special icon in the STB interface

Select a program that has not started yet, click **OK** on the remote control and select one of the following options in the opened window:

- **Switch to channel** when the selected program starts
- **Show notification** when the selected program starts
- **Record program** to set up the program recording

*Connect an external USB drive or SD memory card to the set-top box to be able to record*

After selecting any of the options, the corresponding note will be added to the *Alarms and notifications* list (see **Alarms and notifications** on page **89**).

# Radio

The **Radio** page displays the list of available radio channels. The list of radio channels depends on the customer's service plan (see **Usage examples: Create a service plan** on page **22**).

# Movies

The **Movies** page displays the list of purchased and available for watching media content. You can purchase movies here - **Shop**.


Use navigation buttons to select a movie and press **OK** to start playback.

During playback:

- press **OK** to pause the movie,
- press **Left** or **Right** to rewind forward or backward,
- press **INFO** to open the additional menu. Use this menu to adjust the aspect ratio, to select an audio stream or to turn on subtitles.

# Shop

The **Shop** page displays the list of items, services and content that customers can purchase.


Items and services are displayed in the order fixed on the **Shop** page in the web interface (for more info, see **Web interface: Shop** on page **49**).

Go to the **Movies** folder to see purchased video files and to the **TV** folder to see pay-TV channels to which access was open. How to add a content to the Shop, see **Usage examples: Add a TV channel** on page **18** and **Create a VOD content (a video, a movie)** on page **20**.

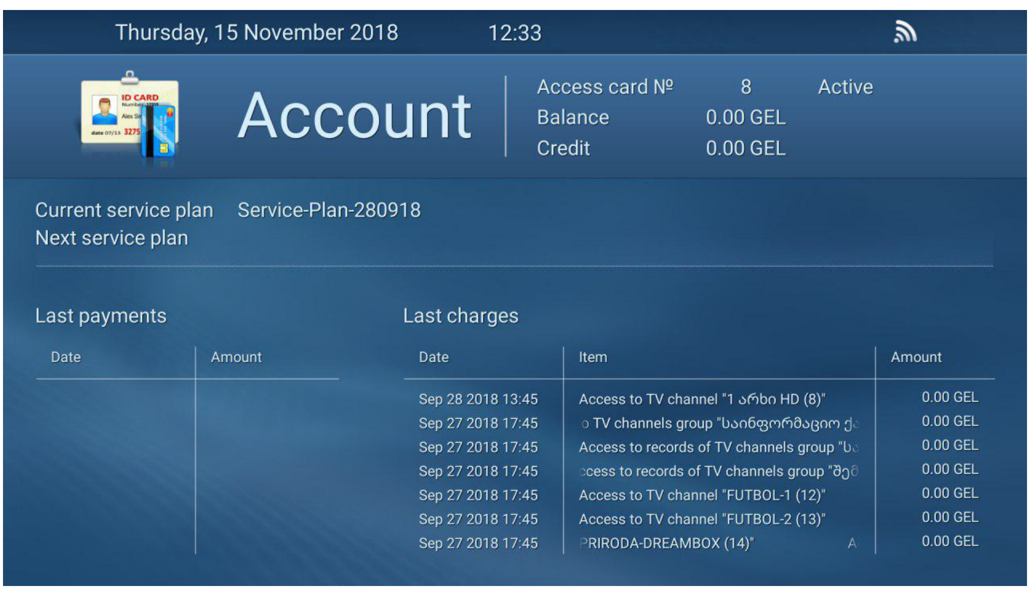
Use **navigation buttons** on the remote control to navigate through folders in the section. Press **OK** to open the selected folder or see an item description or add an item to cart.

# Applications

The **Applications** page displays the list of available Android apps:


# Account

The **Account** page displays financial information and allows user to change the service plan.




Press **OK** on the remote control. In the opened list, select the service plane you want to attach.

> *The list contains service plans that are included in the same group as the current customer's service plan*

# Messages

The **Messages** page displays messages sent to the customer via the manager web interface (see **Manager web interface: STB messages** on page **78**).

# Info

The **Info** can display any additional information. Use the web interface to configure and edit the info page (for more info, see **Web interface: Info page** on page **52**).

## Alarms and notifications

On the NetUP.tv client interface main screen, press the button that opens the additional menu. In the opened window, select **Alarms and notifications**.


This menu displays the list of scheduled events:

 – alarms

 – notifications about switching the channel to the beginning of a program

 – notifications about the beginning of a program

Notifications are added to the list if you select them from the menu on the **TV guide** page (for more info, see **TV guide** on page **85**).

Click **Add alarm**, set time and press **OK**. The added alarm will be displayed on the page and on the top panel of the screen.

Select an alarm or a scheduled event from the list and press **OK** on the STB remote control. In the opened window, click **OK** to delete the alarm or the event.

# NetUP SmartTV

## Overview

The NetUP SmartTV application provides set-top box functionality for TVs on **Tizen** (Samsung), **WebOS** (LG), **Android TV** (Sony, Philips) platforms and allows customers following actions:

- watch available TV channels;
- order and play VoD content;
- check a customer's personal account.

Install the NetUP SmartTV app on a device, launch it and enter the login and the password in the authorization form to run the application.

> *The authorization is possible only if the customer has a personal account.*
> *You assign a login and a password to each customer by adding a customer to database (for more info, see* ***Manager web interface: Customer information page** on page **62****)*

> *For correct operation of the system the Middleware server must be used as its DNS server. If a different DNS server is used, it must be set up to resolve the.iptv zone to the Middleware address, and also to include it in the list of default suffixes for substitution*

The interface items are grouped in the menu:

- **TV channels**
- **Movies**
- **Manage**

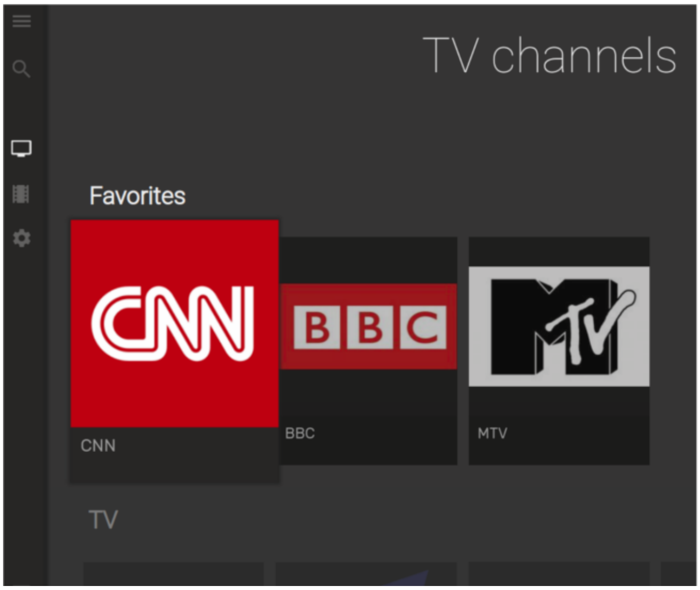
The menu is located on the left side of the screen and you can use it on any tab. Click the menu icon to hide or show it.

Use the search bar under the menu icon to quickly find a TV channel or a movie by its name.

Use a remote control, a computer mouse, a keyboard or a Pointer to navigate through the application menu.

## TV channels

Click the tab to see a list of all available TV channels. The list of channels depends on the customer's service plan. TV channels can be divided into groups and subgroups (for more info, see **Usage examples: Combine media content** on page **22**). The **Favorites** group is created automatically, it combines the channels marked by a customer.




Click on a channel icon or name to turn the channel on. While playing back, a control panel is displayed at the bottom of the screen. Click the heart icon to add or remove a channel from the **Favorites** group, or click the menu icon to open the program guide for the channel.

*If the heart icon is painted over, the channel is added to the Favorites list*

## Movies

Click the tab to see a list of available movies. Movies can be divided into groups and subgroups (for more info, see **Usage examples: Combine media content** on page **22**). The **My collection** group is created automatically, it combines the movies purchased by a customer.

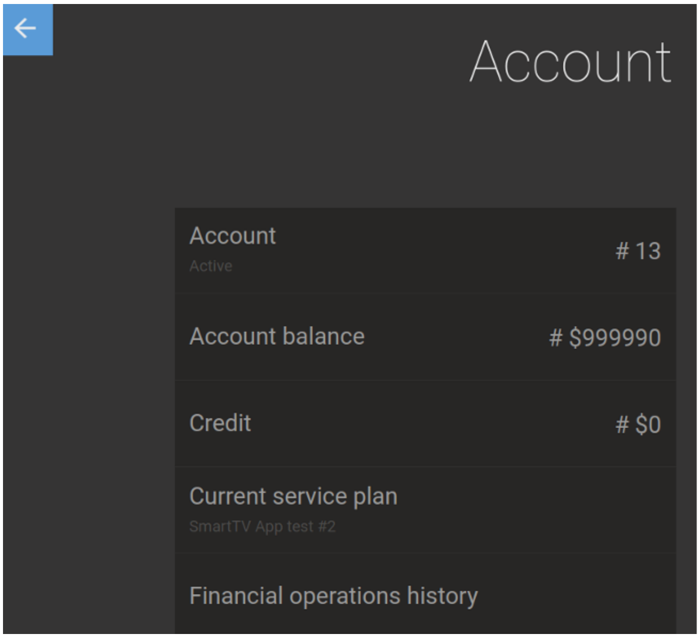
Click on the poster of a movie and make a purchase in the opened window. After payment, the movie will be available for watching and added to the **My collection** group.

## Manage

This tab displays an additional menu consisting of the following items:

- **Settings** – allows to change an interface language;

- **Account** – select this menu item to see an account number and balance of a personal account, the current and next service plan, a financial operation history and access to change service plan;




- **Change user** – allows to log out and go to the authorization page.

# NetUP WEB

## Overview

The NetUP WEB client provides set-top box functionality for mobile devices and allows customers following actions:

- watch available TV channels;
- order and play VoD content;
- check a customer's personal account.

Launch a browser and enter an address **http://<Middleware IP address>/web-player/**. On the opened window, enter the login and the password to authorize.

> *The authorization is possible only if the customer has a personal account.*
> *You assign a login and a password to each customer by adding a customer to database (for more info, see* ***Manager web interface: Customer information page*** *on page* ***62****)*

> *For correct operation of the system the Middleware server must be used as its DNS server. If a different DNS server is used, it must be set up to resolve the.iptv zone to the Middleware address, and also to include it in the list of default suffixes for substitution*

The interface items are grouped in the menu:

- **Television**
- **Movies**
- **Account**
- **Logout**

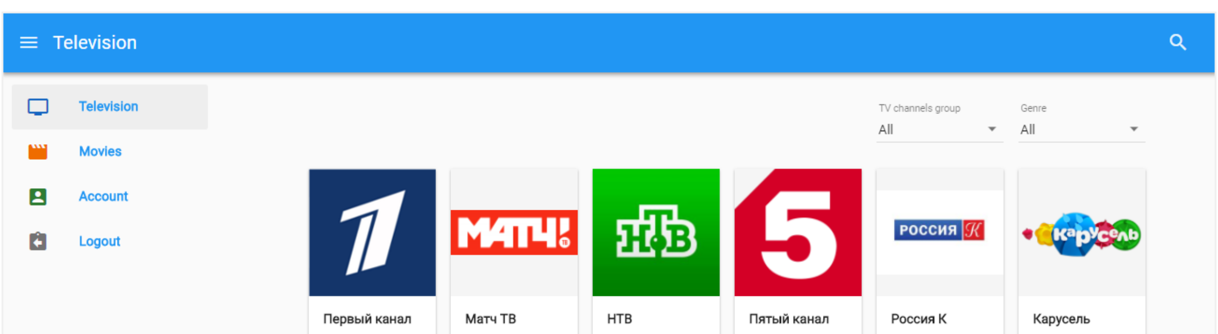
The menu is located on the left side of the screen and you can use it on any tab. Click the menu icon to hide or run it.

Use the search bar in the right upper corner to quickly find a TV channel or a movie.

While watching movies or TV programs, you will have access to the playback control interface and the ability to expand to full screen.

## Television

Click the tab to see a list of all available TV channels. The list of TV channels depends on the customer's service plan.




There are filtering items above the TV channel list on the tab. If you want to order the list, use one of following items:

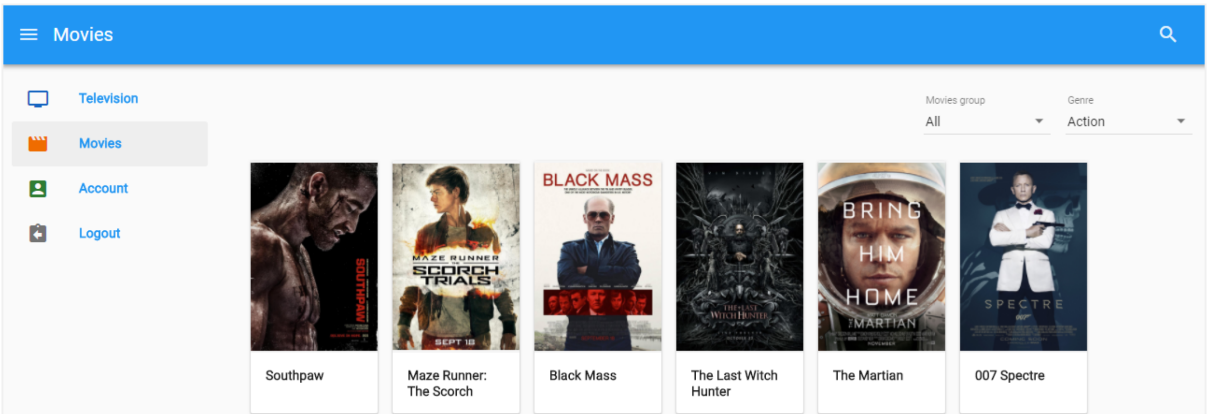
- **TV channels group** – select *one of groups* to open the list of TV channels that it combines. You can specify the group (groups) in a TV channel profile or you can add a TV channel in the group on the 'Media content groups' page in the manager web interface (see **Usage examples: Add a TV channel** on page **18** and **Combine media content** on page **22**);

– **Genre** – select one of genres to open the list of TV channels that relate to it. You can specify the genre in a TV channel profile (see. **Usage examples: Add a TV channel** on page **18**).

Click on a channel icon or name to turn the channel on.

## Movies

Click the tab to see a list of all available videos.




There are filtering items above the movies list on the tab. If you want to order the list, use one of following items:

– **Movies group** – select *one of groups* to open the list of movies that it combines. You can specify the group (groups) in a movie profile or you can add a movie in the group on the 'Media content groups' page in the manager web interface (see **Usage examples: Create a VOD content (a video, a movie)** on page **20** and **Combine media content** on page **22**);

– **Genre** – select one of genres to open the list of movies that relate to it. You can specify the genre in a movie profile (see **Usage examples: Create a VOD content (a video, a movie)** on page **20**).

Click on the poster of a movie and make a purchase in the opened window. After payment, the content will be available for watching.

## Account

Click the tab to see the following information:

– balance;

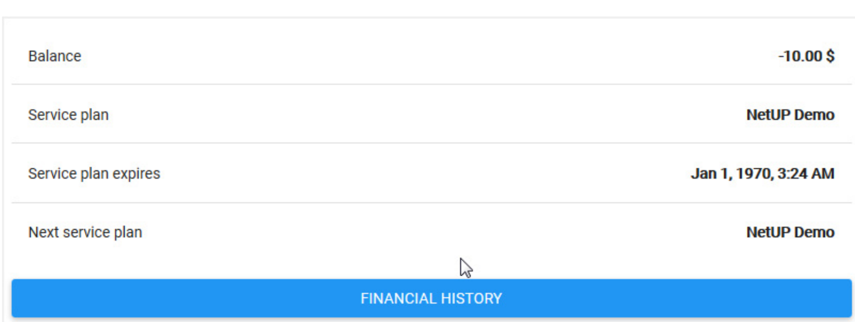
– service plan;

– service plan expires;

– next service plan;

– financial operations.

Click **Financial history** to see the payment history.



# Logout

Click Logout to go to the authorization page.

# NetUP mobile

## Overview

The NetUP mobile application provides set-top box functionality for mobile devices and allows customers following actions:

- check a customer's personal account;
- watch available TV channels;
- listen to available radio channels;
- order and play VoD content;
- access to EPG.

Install the NetUP mobile app on a device, launch it and enter the login and the password in the authorization form to run the application.

*The authorization is possible only if the customer has a personal account.*
*You assign a login and a password to each customer by adding a customer to database (for more info, see* ***Manager web interface: Customer information page** on page **62****)*

*For correct operation of the system the Middleware server must be used as its DNS server. If a different DNS server is used, it must be set up to resolve the.iptv zone to the Middleware address, and also to include it in the list of default suffixes for substitution*

The interface items are grouped in the menu:

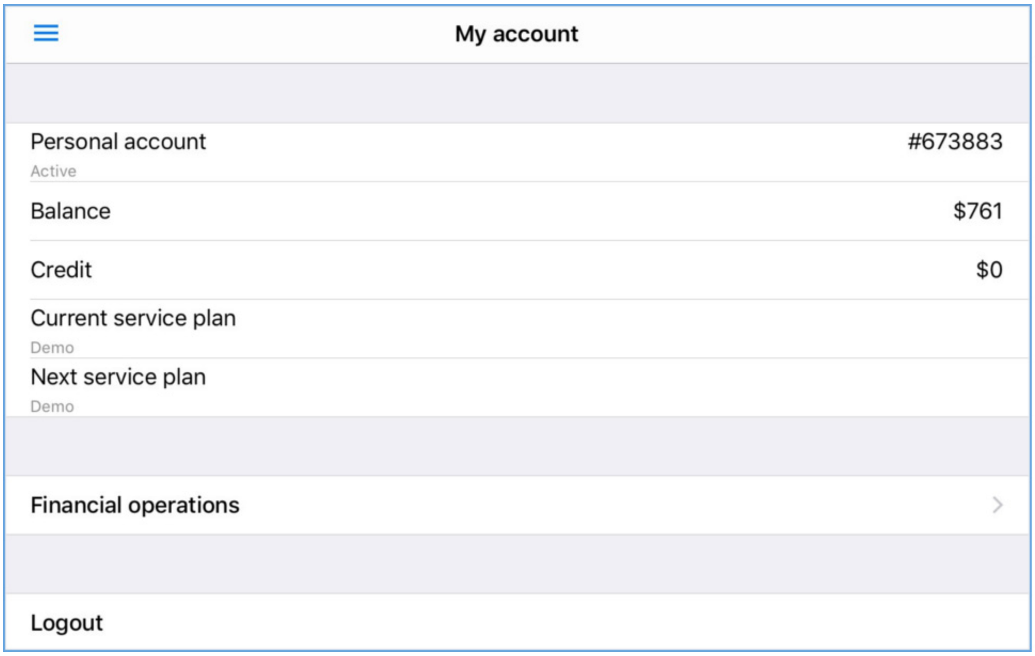
- **My account**
- **TV channels**
- **Radio**
- **Movies**
- **EPG**

The menu is located on the left side of the screen and you can use it on any page. Click the menu icon to show it.

Use the search bar in the right upper corner to quickly find a TV channel, Radio or a movie.

While watching movies or TV programs, you will have access to the playback control interface and the ability to expand to full screen.

# My account



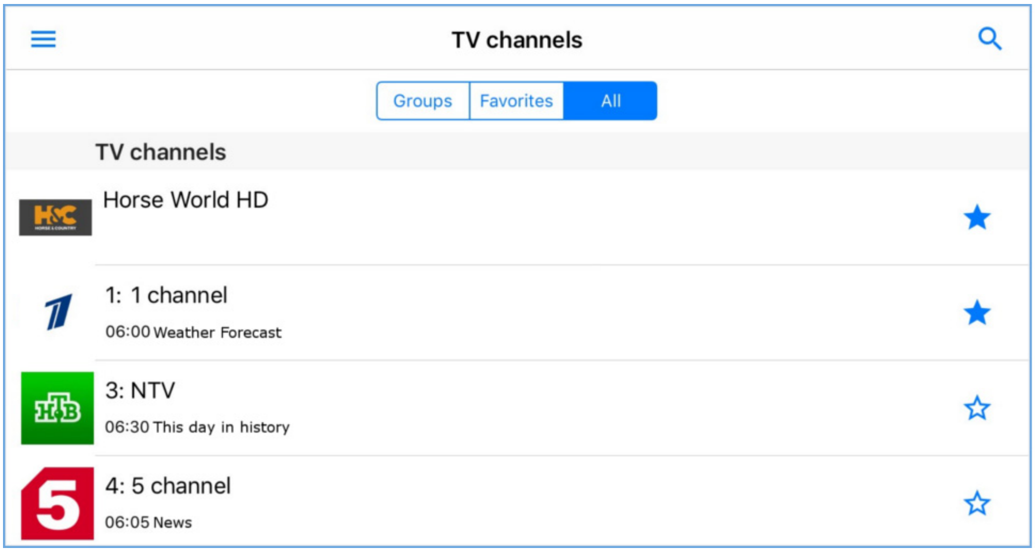

Click the tab to see the following information:

- personal account ID;
- balance;
- current service plan;
- next service plan;
- financial operations.

Click **Financial operation** to see the payment history.
Click **Logout** to go to the authorization page and change user.

# TV channels

Click the tab to see a list of all available TV channels. The list of TV channels depends on the customer's service plan.




There are filtering items above the TV channel list on the tab. If you want to order the list, click on one of following items:

- **Groups** – select *one of groups* to open the list of TV channels that it combines. You can create a group in the manager web interface (for more info, see **Media content groups** on page **65**).
  Click *Back* to return to the group list.
  Click on the *star icon* to add a channel to **Favorites** or remove it from this list.

> *If the star icon opposite the channel is painted over, the channel is added to the Favorites list*

- **Favorites** – click on the *star icon* to remove a TV channel from this list. Press and hold a special icon in front of a TV channel to move it to another position in the list.
- **All** – select this filter to display all available TV channels in the list.

Click on the line with a channel name to turn the channel on. While playing back, double click on the icon of another channel to switch to it or click on the channel icon, and then click **Play.** Click **Done** on the left upper corner to stop playing and to go to the **TV channels** page.

# Radio

Click the tab to see a list of available radio channels. The list of radio channels depends on the customer's service plan.

There are filtering items above the radio channel list on the tab. If you want to order the list, click on one of following items:

- **Groups** – select *one of groups* to open the list of radio channels that it combines. You can create a group in the manager web interface (for more info, see **Media content groups** on page **65**).
  Click *Back* to return to the group list.
  Click on the *star icon* to add a channel to **Favorites** or remove it from this list.

> *If the star icon opposite the channel is painted over, the channel is added to the Favorites list*

- **Favorites** – click on the *star icon* to remove a radio channel from this list. Press and hold a special icon in front of a radio channel to move it to another position in the list.
- **All** – select this filter to display all available radio channels in the list.

Click on the line with a radio channel name to turn the channel on. The playback control panel will appear at the bottom of the screen. Use it to stop playing or close the radio channel.

*Radio playback is possible in the background. Playback will stop when another content is launched.*

## Movies

Click the tab to see a list of available VoD content (video files, movies). Content is divided into groups by genre. You can specify the genre in the video profile during the creation of VoD content in the web interface (for more info, see. **Usage examples: Create a VOD content (a video, a movie)** on page **20**).

Click on the poster of a movie and make a purchase in the opened window. After payment, the content will be available for watching and will display in the **Recent** group.

## EPG

This page displays the program guide for available TV channels in the near future.

# System maintenance

## Backup copies

Automatic backup copies are created daily. Besides, a backup may be created at any time via web interface on the **Backup** page (the **System administration** group).

To set up daily automatic download of the backup files, set up the download program (for example, wget) to get the data from the URL containing the authentication data:

```
http://login:password@10.1.0.102/
page/backup/download_backup.php?file=backup_current.tar.bz2
```

Go to the **Backup** page in the web interface. Left-click on a backup and click **Restore backup** in the opened window if you want to roll back to the backup.

*Firmware of different versions of the NetUP.tv system may not be consistent with each other.*
*If you need to return and use the firmware related to previous releases, contact the NetUP technical support department*

If you want to use the backup that is storied on an external device, at first you must connect to the server via FTP or SCP, using *system-backup* user name and the administrator's password and upload the backup.

## Editing IP table rules

User rules should be added to the */netup/sysconfig/iptables/50user.xml* file

*If there is no 50user.xml file in the specified directory, create it*

The user rules file has `<config>` root element with an optional `disabled` attribute. If the disabled attribute is used with any value, rules from this file will be ignored.

The `<config>` element may contain an arbitrary number of `<table>` elements with a mandatory `name` attribute.

Each `<table>` element may contain an arbitrary number of `<chain>` elements with mandatory `name` and optional `policy` attributes.

Each `<chain>` element may contain an arbitrary number of `<rule>` elements without attributes.

Each `<rule>` element may contain an arbitrary number of `<option>` elements with mandatory `name` and `value` attributes. If an option is not supposed to have a parameter, leave the `value` attribute empty. If an option is supposed to have several parameters, assign those parameters, separated by spaces, to one `value` attribute

When finished editing, save the file and launch the */netup/bin/configure-iptables.py* utility.

The utility returns:

- 0, when no errors occurred
- 1, when an error occurred while applying rules (except rules, described in the *50user.xml* file)
- 2, when an error occured while applying rules from *50user.xml*. In this case a `disabled` attribute has been added to the `<config>` root element and the rules from this file were ignored.
- 3, in case of any other errors

Here is an example of a configuration file:

```
<?xml version="1.0" encoding="UTF-8"?>
<config>
    <table name="filter">
        <chain name="INPUT">
            <rule>
                <option name="-i" value="lo" />
                <option name="-j" value="ACCEPT" />
            </rule>
            <rule>
                <option name="-p" value="tcp" />
                <option name="-m" value="tcp" />
                <option name="--dport" value="3306" />
                <option name="-j" value="mysql" />
            </rule>
        </chain>
        <chain name= "mysql" />
    </table>
</config>
```

## Network troubleshooting

If an STB does not play streaming video, this may be due to network errors. To rule out possible communication problems, plug the STB and the streamer into the same switch. If the streamig video still does not show up, attach a PC instead of the STB and check that the media is actually streamed to the specified multicast address, and that no extraneous signal is streamed together with it The VLC media player may be used to view the video stream on PC ( **http://www.videolan.org/vlc/**). Open it's main menu and select **Media** – **Open Network Stream**.

## NetUP server troubleshooting

Connect a monitor and keyboard to the server to debug it. Use HDMI or VGA to connect the monitor and USB to connect the keyboard.

## NetUP server factory reset

If your NetUP server needs a factory reset, please contact NetUP technical support.

## Android based STB diagnostics

Android based STBs have an event log that is kept in RAM. One needs to install adb (Android Debug Bridge) utility in order to access that event log. Adb is a part of Android SDK. It is available by the the URL: **http://developer.android.com/sdk/index.html**

Besides accessing the event log, adb allows you to execute other commands. Some of them are described below.

Use a console to execute adb commands.

- use adb connect <STB IP address> command to connect to an STB. As a result, the STB will appear in the list of connected devices. You can access that list with an *adb devices* command.
- use the *-s* key to specify the device's serial number if more than one device is connected. The serial number is assigned by the adb. Use the *adb devices* command to display the devices list:

```
$ adb devices?List of devices attached? 10.1.4.82:5555 device
```

In this example device's serial number is *10.1.4.82:5555*, and a command that would display the event log would be the following:

```
$ adb -s 10.1.4.82:5555 logcat
```

*If only one device is connected, you can omit the -s key*

- use *adb shell* command to run a remote console on the device.
- use the following command to copy files from your computer to the device:

```
$ adb push <local> <device>
```

e.g.:

```
$ adb -s 10.1.4.82:5555 push /tmp/test.txt /temp
```

- use the following command to copy files from the device to your computer:

```
$ adb pull <remote> <local>
```

e.g.:

```
$ adb -s 10.1.4.82:5555 pull /temp/test.txt /tmp
```

- use the *logcat* command to display the event log content:

```
$ adb -s 10.1.4.82:5555 logcat -v time
```

- use *cat /proc/kmsg* command to display all unread kernel messages and continue to output all new kernel messages. E.g.:

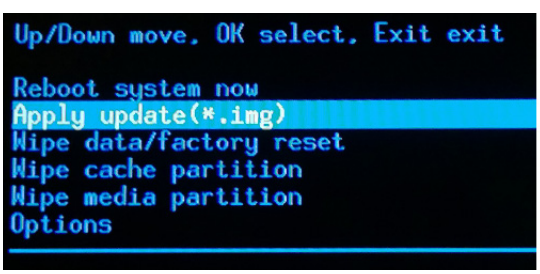
```
$ adb shell su -c cat /proc/kmsg
```

*Follow this link to find the full list of adb commands:* ***http://developer.android.com/tools/help/adb.html#commandsummary***

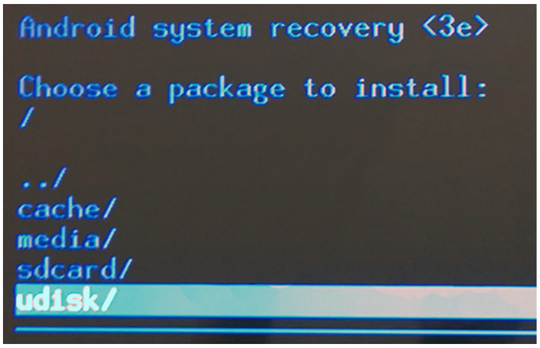
## Firmware upgrade in recovery mode

For NetUP Android IP STBs there is an option of upgrading the firmware, using the system recovery mode:

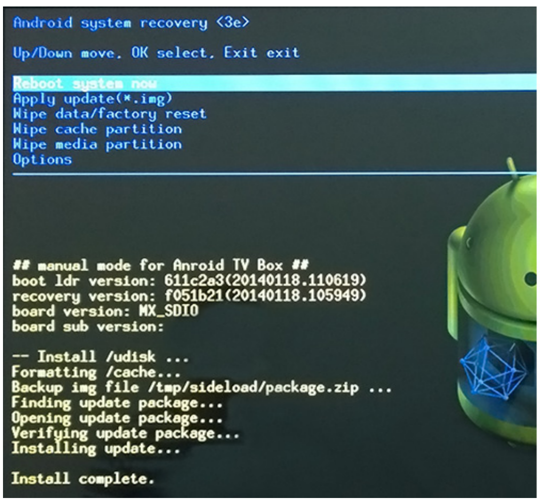
- unplug an STB power supply
- press the power button on the STB, holding the button and connect the power supply
- release the button when the red indicator underneath it lights up and the **Android system recovery** menu appears on the TV screen
- connect a flash drive to the STB. Make sure the flash drive stores a firmware file in its root directory
- choose the **Apply update** option from the menu



- go to the root directory of the flash drive and open the firmware file




- when the installation is complete, choose **Reboot system now** from the menu to reboot the STB




- use the STB as usual

# Glossary

## Networking

- **DNS** – Domain Name Service is a distributed hierarchical system that stores IP addresses, domain names and various information associated with them.
- **TCP/IP** – Transmission Control Protocol / Internet Protocol is a stack of communication protocols used in computer networks.
- **FTP** – File Transfer Protocol is an application level network protocol for file transfer.
- **HTTP** – Hypertext Transport Protocol is an application level network protocol for data transfer.
- **RTSP** – Real-time Streaming Protocol is an application level network protocol that serves for signalling during the multimedia data transfer.
- **RTP** – Real-time Protocol is a transport level network protocol for delivering real-time traffic over IP networks.
- **UDP** – User Datagram Protocol is a simple transport level network protocol for data transfer.
- **TCP** – Transmission Control Protocol is a transport level network protocol for data transfer with guaranteed delivery.
- **DHCP** – Dynamic Host Configuration Protocol is a network protocol for obtaining IP addresses and other auxiliary information in TCP/IP networks.
- **IGMP** – Internet Group Management Protocol is a network protocol that manages group routing.
- **NTP** – Network Time Protocol is a network protocol for synchronizing the internal clocks of computer systems.
- **MAC** – Media Access Control is a sub-layer of OSI model that provides addressing and channel access control mechanisms.
- **MAC-адрес** is a unique identifier assigned to a device in a network.
- **LAN** – Local area network.
- **VLAN** – Virtual Local area network. Standard 802.1q.
- **NFS** – Network File System is a file system distributed among multiple machines.
- **SSL** – Secure Socket Layer is a cryptographic protocol for communications over TCP/IP networks.
- **Switch** is a device joining several nodes within a network.
- **Unicast** is a transmission of information packets to a single destination.
- **Broadcast** is a transmission of information packets to all devices in a network.
- **Multicast** is a transmission of information packets to a certain group of destinations.
- **Multicast group** is a group of destinations in a multicast transmission.
- **Multicast router** is a router capable of routing multicast streams.

## Television

- **Polarization** is a characteristic of the satellite signal (may be vertical, horizontal, circular left, or circular right).
- **Symbol rate** is a satellite signal transfer rate.
- **Transponder** is an automatic device that may receive and retransmit a signal.
- **LNB converter** – Low-Noise Block is a device that converts a satellite signal for transmission over a coaxial cable.
- **Receiver** is a device that receives a converted satellite signal and transforms it into a form usable for the consumer.
- **DiSEqC** – Digital Satellite Equipment Control is a special communication protocol for use between a satellite receiver and other devices.
- **Multiswitch** is a device for connecting several receivers to the same satellite dish.

- **FTA** – Free-to-air refers to a non-encoded stream.
- **CSA** – Common Scrambling Algorithm is an encryption algorithm used in DVB.
- **Codec** is a device or computer program capable of encoding and/or decoding a digital data stream.
- **MPEG** is a suite of data compression standards used for digital multimedia.
- **MPEG TS** – MPEG transport stream is a container format used for storage of multimedia data.
- **MPEG PS** – MPEG program stream is a container format used for storage of multimedia data.
- **Audio PID** – in a MPEG-encoded file or stream is an identifier of audio data.
- **Video PID** – in a MPEG-encoded file or stream is an identifier of video data.
- **H.264** is a standard for video compression (subset of MPEG-4).
- **SD** – Standard Definition is the resolution of 720x480 or 720x576.
- **HD** – High Definition is the resolution of 1280x720 or 1920x1080.
- **HDTV** – High Definition Television is a standard for high-resolution digital TV broadcasting.
- **DVB** – Digital Video Broadcast is a suite of standards for digital television. Includes the following subsets:
  - DVB-S for satellite broadcasting;
  - DVB-S2 for high definition satellite broadcasting;
  - DVB-C for cable broadcasting;
  - DVB-T for terrestrial on-air broadcasting;
  - DVB-T2 for terrestrial on-air broadcasting.
- **RF** is a format of analog video signal for on-air transmission.
- **RCA (AV)** is a format of analog audio and video signal for short-range cable transmission.
- **S-Video** is a format of analog video signal for short-range cable transmission that carries the luminance and color signals separately.
- **PAL** is a color-encoding system for analog TV accepted in Europe.
- **SECAM** is a color-encoding system for analog TV accepted in France, Russia and some other countries.
- **NTSC** is a color-encoding system for analog TV accepted in USA.

## IPTV

- **Streamer** is a device that receives an on-air or other signal and transmits it over an IP network. Particular varieties include DVB-to-IP gateway and MPEG encoder.
- **Middleware** is a set of software that controls the interaction between the components of an IPTV solution (streamer, VoD servers, CAS, and user STBs).
- **CAM** – Conditional Access Module is a module that provides restricted access to the broadcast media data.
- **MMI** – Machine-Machine Interface is an interface used for interaction between CI and CAM.
- **EMM** – Entitlement Management Message is an encrypted message stating the user's right of access to multimedia data.
- **CI** – Common Interface is an interface of interaction with CAM (standard EN 50221).
- **CAID** – Conditional Access system ID is the Conditional Access system ID.
- **VoD** – Video on demand.
- **TVoD** – Television on demand.
- **NPVR** – Network Personal Video Recorder.
- **EPG** – Electronic Program Guide.
- **PPV** – Pay per view is a system in which TV viewers can purchase events to be seen on TV.

- **CAS** – Conditional Access System is a system that protects the content from unauthorized access.
- **SMS** – Subscriber Management System.
- **Time-Shifted TV** is a sort of TV with pause and rewind options.
- **STB** – Set-top box.

# Other terms

- **XML** – Extensible Markup Language is a markup language for storing structured data.
- **RAID** – Redundant array of independent disks is a fault-tolerant array of hard disks.
- **Database** is a structured collection of data records stored in a computer system.
- **Cluster** is a group of linked computers used as a single hardware resourse.
- **DRM** – Digital Rights Management is the aggregate of access control technologies used to prevent unauthorized usage of digital media or devices.
- **Billing** is a system that collects information about services that are going to be billed to the customer.
- **Firmware** is a fixed program that internally controls some electronic device.
- **ISO** – International Organization for Standardization.
- **ANSI** – American National Standards Institute.

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