



Digital broadcasting synthesizer control center
for **SunWave Broadcasting System**

A large, faint, light yellow version of the SunWave Broadcasting System logo is centered in the background of the page.

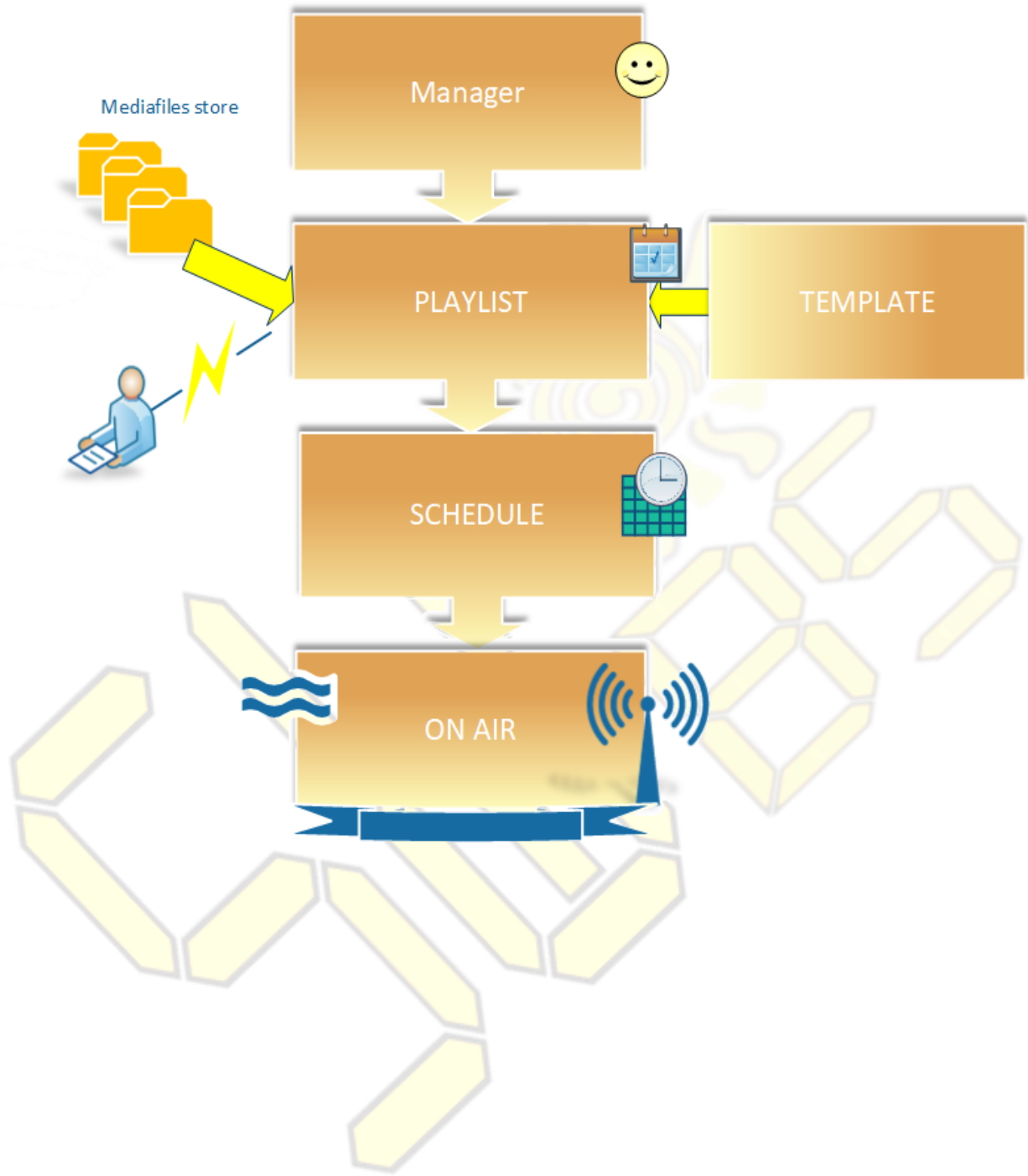
USERS MANUAL

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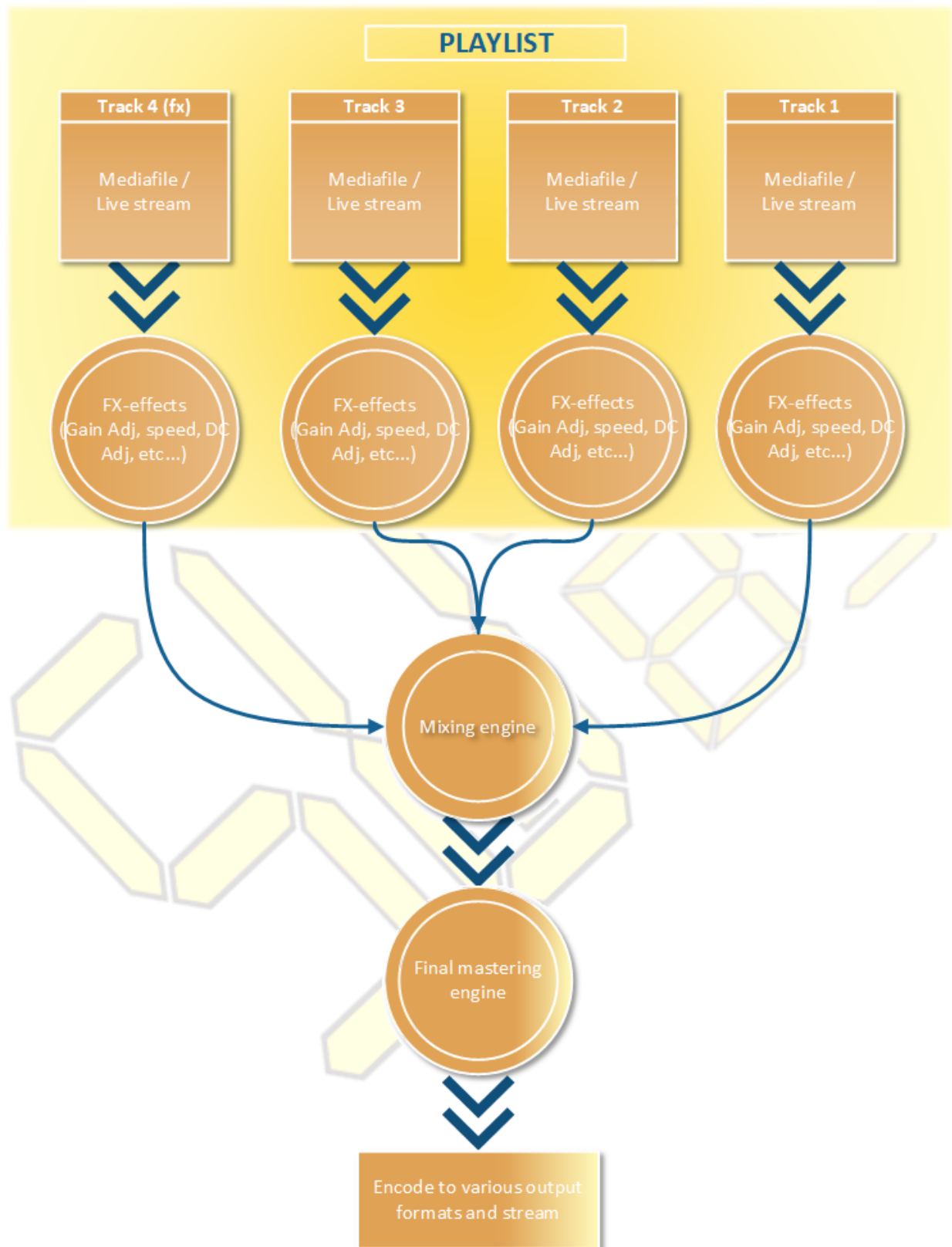
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GENERAL SYSTEM WORKFLOW



Broadcasting central workflow

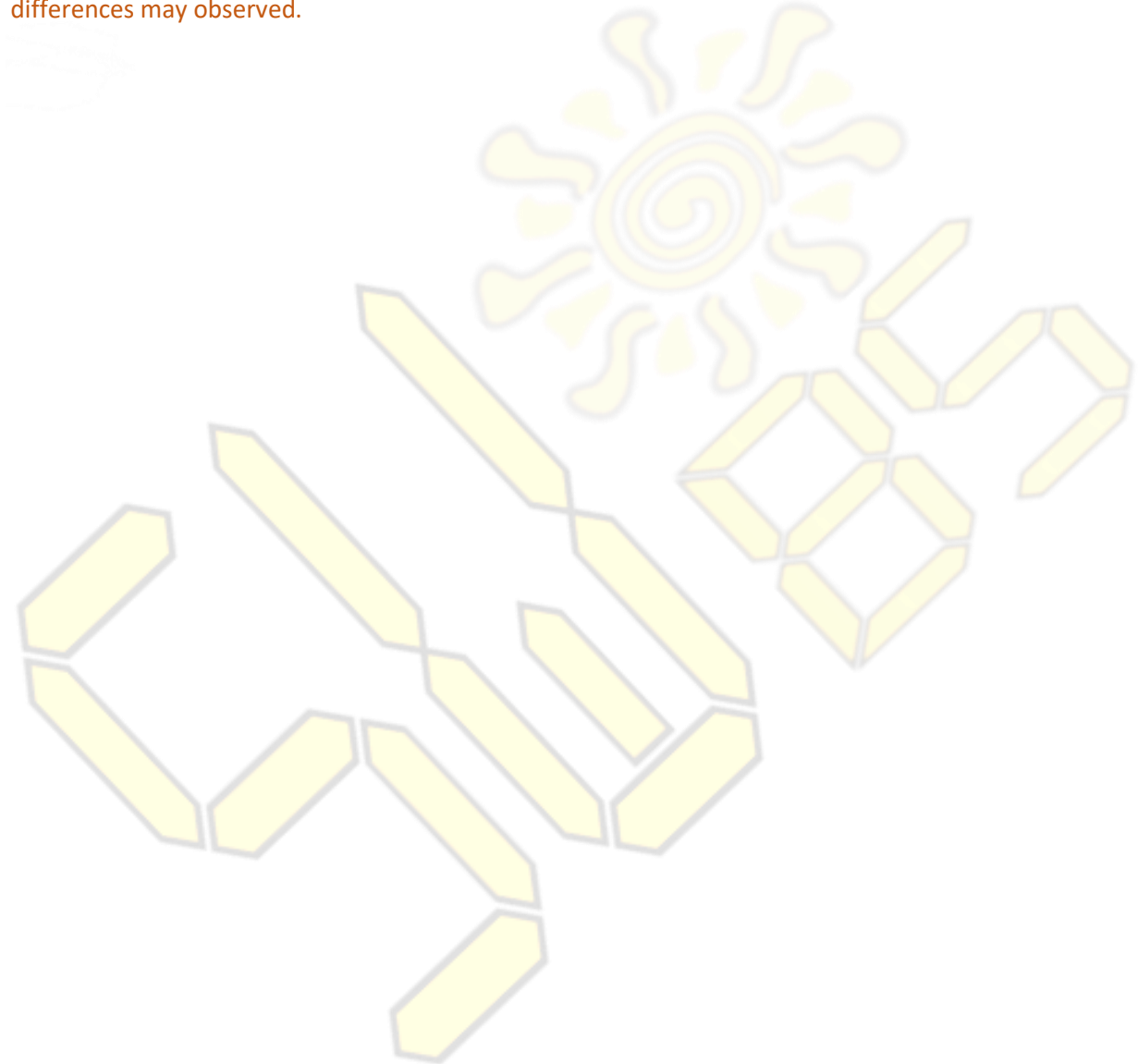


For actions in the system, you can use both WEB-based management (*thin* client) and the Windows client (thick client, referred to as *full* client). Both types of clients work only with cloud data. So you can start work on one machine and continue on another without transferring any file.

It is worth considering the functional differences between a full client and a thin one. *The documentation further describes the full functionality in the reference full client.*

Over 80% of all described here features are available in thin web client.

 This instruction is valid for the Windows client version 1.73. In other versions, some functional and visual differences may observed.



INTRODUCTION

Requirements to run:

- *Microsoft Visual C 2017 Redistributable (x86)*. If your computer is connected to the Internet, downloading and installing Microsoft Visual C 2015 Redistributable will be done automatically by the installer. Otherwise, you must go to www.microsoft.com in advance and download this software component yourself.
- *Two-button mouse*
- *Keyboard*
- *DirectSound 9 compatible sound card*
- *Monitor with a minimum resolution of 1280x*
- *Windows 7 or higher*


Tests confirm that the client works on *Linux* operating systems with *WINE* package installed (32 bits) version 1.7 and higher.

Launching

At first you need to download and run the [sccvnsetup.exe](#) installer using the rights of the administrator or user. After installation and launch, an authorization window will appear on the screen:

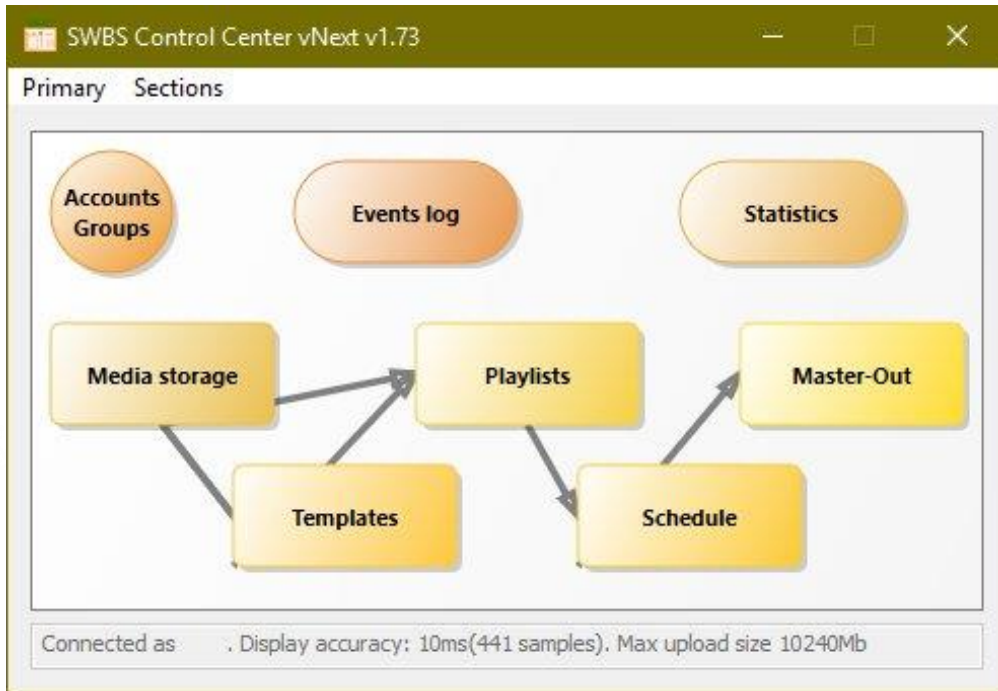


Enter your login and password.

 Get started by changing your account password first (Main window Menu --> change password)

After entering correct credentials, a block diagram will appear on the screen, with elements leading to sections (section items are duplicated in the top menu). Double-clicking on an element will open the section. The diagram clearly illustrates the entire working cycle of a typical network broadcasting station, from adding materials in the archive to creating playlists with audio materials embedded into it and schedule that on the air.

User-Interface of program is automatically switched upon starting between available translation languages reflecting your windows session display language. Currently available is English (default) and Russian.



Section	Purpose
Accounts and groups	Managing accounts, groups, access rights to sections, setting media storage quotas
Playlists and templates	Managing templates and playlists for placement in the broadcasting schedule grid
Radio broadcasts	Manage broadcasts and their properties
Media storage	Manages all audio files materials and related things
Schedule	The entire broadcasting grid is built here by placing broadcasts and playlists
Statistics and analytics	View automatically generated analytical data, including data on leading programs, Deejays, played files, transfer ratings, etc.
Events log	Audit data on all changes in the system, as well as its operation
Master-out	It is used to configure codec parameters and output signal formats, as well as live broadcast reception parameters

SECURITY AND PERMISSIONS

The screenshot shows the Security manager interface with the following data:

Name	Login	Creation date
Just be free	pacman	15.06.2023 1...
testacc	testac...	04.06.2014 1...
John Doe	joeac...	06.06.2016 2...
dont remember	teamz...	06.06.2016 2...
Connor	teancon	06.06.2016 2...
the name of the...	usr3	06.06.2016 2...
Mr. auto dj	robot	07.09.2013 0...
Laura	laura943	08.02.2015 2...
Schedule sync u...	sched...	24.11.2016 2...
statistics client	statsc...	05.09.2015 2...

Modify date	06.06.2016 22:02:29
Last logon	28.01.2022 14:15:27
Login	usr3
Password	***
E-mail	
Name	the name of the user
Nickname	usr3
Blocked	No
Success logons	1
Failed logons	0
Groups membership	
Timetable editors	

Name	Creation date
Human Deejays	08.10.2013 01:59:04
Founders	05.02.2013 00:39:13
test group	06.02.2016 14:31:37
iruta group	15.06.2023 17:25:59
Media store editors	05.02.2013 00:40:48
Read only Auditors	13.10.2014 00:29:23
Radioshows editors	23.10.2013 00:05:17
Public Site syncro	24.11.2016 22:37:39
Playlist editors	06.10.2013 22:38:40
Automatic Players	22.08.2013 19:36:52
Timetable editors	06.10.2013 22:40:30

Media settings	
Number of samples in 1ms	441
Media item single size limit	150.000MB
Total size limit	0.000B
Total size limit used	0.000B
Total number of media items limit	220
Total number of media items limit...	0
Media item single duration limit	1 Day(s) 00:00:00
Total media duration limit	0 Day(s) 00:00:00
Total media duration limit used	0 Day(s) 00:00:00
Access levels	
Audit	No access
Accounts	Change Password

Each user uses an individual account to log in. The account includes the following data:

Creation date	Account creation date and time
Modify date	Automatically record time when changes to account properties was made
Login	Login must contain from 3 to 32 characters, consist of letters of the Latin alphabet and numbers from 0 to 9. Case insensitive
Password	The password must contain at least 6 characters. Be sure to use both lowercase and uppercase letters. In addition, any Unicode characters may be used
E-Mail	Contains user account valid e-mail address used for password restore functionality
Name	Optionally, can contain Fist and Last user name
Nickname	The on-air alias of the user. Please keep in mind that a nickname is publicly visible and available information that is displayed both inside and outside the system (including on the site)

Blocked	Account blocked for logon or not. You can manually block/unblock it or after 3 attempts to enter invalid password system will block it automatically
Success logon count	Shows the total number of successfully authorized sessions in the account since it was created
Bad logon count	Shows the number of failed account authorizations since it was created. NOTE: After every 3 attempts to enter the password incorrectly, the account will be automatically blocked until someone with necessary rights unlock it.

Accounts appear directly in the broadcast schedule, system event log, radio broadcasts, playlists and other parts of the system.

Permissions system

Access rights are delimited by a group principle, which simplifies the entire system administration process. Thus, in order to assign a user certain rights, he must be add to certain group possessing these rights. By default, the new accounts is not included in any group, giving only right to logon (authorize).

The administrator (or those having the necessary access rights) independently add each newly created account in the groups necessary for the user to work.

The system partition all rights to 2 global types:

1. *The class right* (top level). Maximum available right
2. *Instance right*. It is separation of maximum class right to multiple small different rights

Groups can include any number of user accounts. Each account can be member of several groups simultaneously. Many operations in the system require a certain level of rights granted in several sections at the same time.

Access levels	
Audit	Full access
Accounts	Full access
Groups	Full access
Schedule	Full access
Playlists	Full access
Media storage	Full access
On-Air broadcasting	No access
Radio broadcasts	Full access
Ratings and statistics	Full access
System settings	Editing

For example, by assigning the global “preview” right, you can revoke the “change metadata” and “Change FS” instance rights at the directory level, thus prohibiting these actions.

Example 1: A user who has the right to view the contents of playlists and templates does not automatically receive right to view the properties of each audio file contained in playlist in the media store.

Example 2: The right to view the schedule does not automatically receive right to view (traverse) all broadcast-capable accounts in system.

System sections and related rights details

Section	Access right	Meaning
Audit	<i>No access</i>	Section and all its sub items is unavailable
	<i>Viewing</i>	Only view audit log is possible
	<i>Full access</i>	Adds remove access right (clear the log)
Accounts	<i>No access</i>	Section and all its sub items is unavailable
	<i>Change Password</i>	Only change password for your account is possible. List your-own sessions and forced destroy him is possible too
	<i>Cross listing</i>	Adds ability to list specific accounts in various parts of system. Without detailed properties and without all accounts listing
	<i>View properties</i>	Adds ability to view all accounts and its detailed properties
	<i>Change properties</i>	Adds ability to change all accounts properties but you can't change password for another accounts
	<i>Full access</i>	Adds change password right. Allow Add or remove accounts. Allows view all active sessions in system. Adds ability to purge selected sessions
Groups	<i>No access</i>	Section and all its sub items is unavailable
	<i>Cross listing</i>	Adds ability to list specific groups in various parts of system. Without detailed properties and without all groups listing
	<i>View properties</i>	Adds ability to list all groups and view detailed group properties
	<i>Change properties</i>	Adds ability to edit all group properties without rights assignments
	<i>Change access rights</i>	Adds permission to edit access rights to sections
	<i>Full access</i>	Adds ability to create new or remove existing groups. Assign/Remove moderator access
Schedule	<i>No access</i>	Section and all its sub items is unavailable
	<i>Listing (group)</i>	Allow to list of scheduled broadcasts without details
	<i>View (group)</i>	Adds ability to see all broadcast items properties
	<i>Edit (group)</i>	Adds ability to edit (change) selected items properties
	<i>Create and delete</i>	Adds ability to create new or remove existing items. Adds ability to force reload of currently on the air playlist
	<i>Full access</i>	Adds ability to edit security rights, configure schedule auto renew, configure/view stream dump
	<i>Full access</i>	Adds ability to edit security rights, configure schedule auto renew, configure/view stream dump
Templates and Playlists	<i>No access</i>	Section and all its sub items is unavailable
	<i>Cross listing (group)</i>	Adds ability to list specific playlist and templates in various parts of system. Without details and full listing
	<i>View (group)</i>	Adds ability to view template (and playlist) all details and contents
	<i>Editing (group)</i>	Allow listing all templates and edit its properties including renaming

	<i>Editing playlists (group)</i>	Ability to view and edit playlists
	<i>Full access</i>	Adds ability to edit access rights, create new, remove existing
Media store	<i>No access</i>	Section and all its sub items is unavailable
	<i>Viewing (group)</i>	Allow to view items list and all its properties
	<i>Editing (group)</i>	Adds ability to edit file items properties
	<i>Change FS (group)</i>	Adds ability to upload new items, create, rename, delete or move operations
	<i>Prelistening (group)</i>	Adds ability to prelisten item with reduced-quality streaming from store
	<i>Full access</i>	Adds ability to reset counters, edit security access rights, ability to configure folder autotagging feature
On Air	<i>No access</i>	No right to broadcast and be scheduled
	<i>Allowed</i>	Adds the right to go on air and be scheduled
Radio broadcasts	<i>No access</i>	Section and all its sub items is unavailable
	<i>Listing (group)</i>	Allow list all radioshow
	<i>Viewing (group)</i>	Add view any radioshow right
	<i>Editing (group)</i>	Adds editing right
	<i>Full access</i>	Adds ability to create new shows, remove existed and edit security access rights
Statistics and analytics	<i>No access</i>	Section and all its sub items is unavailable
	<i>View (group)</i>	Allow see various types of charts and statistics
	<i>Upload</i>	Allow upload telemetry data to system
	<i>Configuration</i>	Allow adding/removing/editing configuration of statistics sources
	<i>Full access</i>	Adds security access editing right
Legal Lawyer	<i>No access</i>	Unavailable to do moderator functions in store
	<i>Allowed</i>	Adds ability to control (deny/allow) material usage in media store after it is uploaded by someone
Master-Out	<i>No access</i>	Section and all its sub items is unavailable
	<i>View</i>	Allow view all system configuration except passwords
	<i>Edit turntables gain</i>	Allow changing realtime turntable volume gain
	<i>Editing</i>	Allow seeing password and editing all properties

Administrators of accounts have the opportunity to see a list of all established sessions with the system (top menu, Sessions-> Show), and, if necessary, close them. Normal users only see his own sessions.

 Changing anything for the group of global administrators “Founders” is not available to users of the system!

Media settings (quota and signal resolution)

When you give some group right “Change FS” in section «Media store» come into effect next 9 settings:

1. **The number of samples in 1ms of audio.** Defines the accuracy of information stored in the system about audio waveform in the store. It is set between 128 and 4096. By default, the optimal number is set - 441. This is tradeoff between waveform details, data storage occupied and consumed bandwidth during transmission to/from cloud and waveform level of details.

2. **Single file size quote limit.** Sets the maximum size of each media file (in kilobytes) allowed to upload this group. Maximum limit is *10 Gigabytes* per file.
3. **Total files size quote limit.** Sets the maximum allowed size for this group of all media elements it has placed in the archive (in kilobytes). The limit is *2 Terabytes*. When setting 0, the mechanism turns off.
4. **Total files size quote limit used.** Shows the size currently used by this group of all media elements it has placed in the archive (in kilobytes).
5. **Single file audible duration quote limit.** This limits each media file duration uploaded by members of the group. Maximum limit is *24 hours* per file.
6. **Total files duration quote limit.** Enables quotas for the total duration of media files in the store for this group. Maximum limit is *365 days*. When setting 0, the mechanism turns off.
7. **Total files duration quote limit used.** Shows the amount of used by group limit on audio files.
8. **Total number of files quote limit.** Sets and enables the counting mode of the total number of items placed in the media storage. Maximum limit is *100 thousand elements*. When setting 0, the mechanism turns off.
9. **Total number of files quote limit used.** The used (current number) of items in the archive uploaded by this group.

Data size values support human notation strings. Example: 10gb, 5mb, 69,5mb.

The quota mechanism allows you to flexibly set the space allocated for each presenter (DJ) for his audio materials. He will be able to immediately upload them to the archive for quick availability. Then, after quickly going through the technical verification and confirmation procedures, they will appear on the air according to the playlist posted on the schedule. Which in turn will be generated automatically using a template. A lot of steps in this workflow will be performed automatically by system.

Streaming (in/out) parameters

When you give some group right “On Air” or “Store prelisten” come into effect next few settings

<input checked="" type="checkbox"/> Streaming params	
prelisten quality	5
prelisten bitrate	48
Gain correction	0.000000
Network lags protection (ms)	04.000
Override global	False
<input checked="" type="checkbox"/> live broadcasting	
Codec	MP3
Bitrate	24
Quality	5
Stereo submode	J-Stereo
Encoding mode	CBR

1. **Prelisten quality.** Defines codec processing quality when someone making changes to media store and willing to listen some fragments on selected item. (10 - Highest, but requiring a more CPU resources. 0 - the worst, but not requiring a large CPU resources).
2. **Prelisten bitrate.** Defines codec bitrate (from 24kbps to 320kbps) when someone is editing media properties and willing to listen some fragment.
3. **Gain correction.** When set to 0, no correction is performed. Allows you to pre-adjust the volume of the signal received from the participants in this group. Available values are indicated in decibels from *-10 to +10 dB*.
4. **Network lags protection.** If you specify 0, the buffer will be calculated dynamically by the system based on observable network delays. Setting allows you to force specified buffer for the received live broadcast signal over the network. Increasing it introduces audible delay in the signal path. Range from *0 to 10 seconds*.

5. **Override global.** This switch enables local (per-group) live streaming encoder configuration. If this option is not enabled then global (system) level setting come into effect. This is very convenient feature enabling different group of accounts have different settings. For example correspondent with voice-only live from some event doesn't eat too high bandwidth when using mobile device.
6. **Live broadcasting.** Defines settings of encoder similar to system global configured setting described later.



MEDIA STORAGE

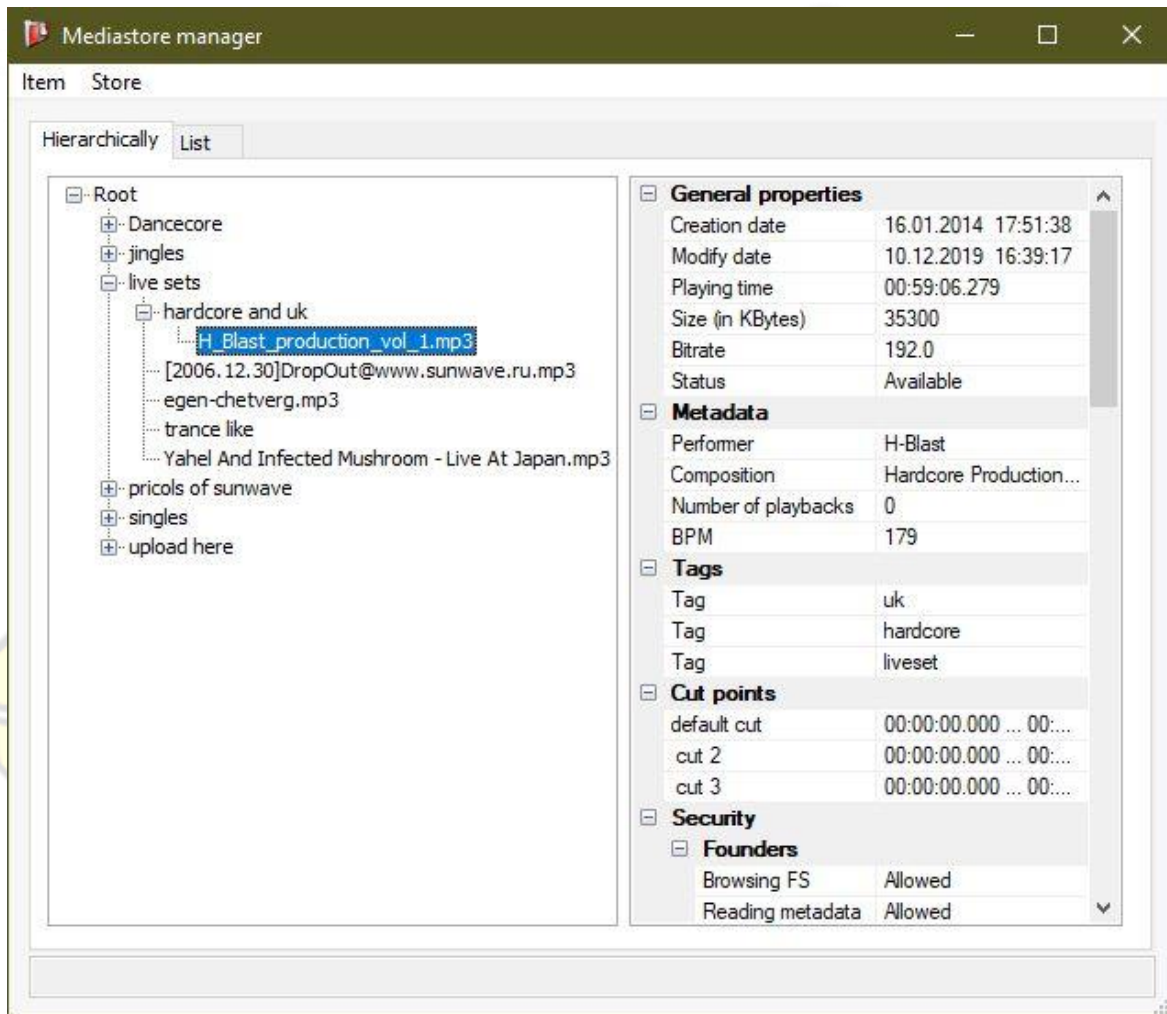
General view and basic properties

Media storage - a complete collection of all audio files that can be viewed in one of two modes:



Files and folders names are case-insensitive!

Hierarchical tree



In hierarchical tree mode, searching by elements is not available, but available:

- *uploading of new audio files*
- *change security access rights on folders*
- *folder auto-tagging configuration*

In addition, in this mode, you can use the mouse to move files from one folder to another, including between levels, and also transfer them to a playlist / template.

If current selected item is folder then in right pane some properties will display summarized data. For example duration, filesize, number of playbacks will count all child items, tags will show all all folders autotags (from upper to lower).

List

Item	Store	Performer	Composition	Playing time	Numb...	Creation date
es\chill and ambient...		nookie feat I...	paradise	00:05:01.557	363	19.08.2014 20:48:31
es\chill and ambient...		Various	4 Wings / Penelope...	00:06:12.532	363	19.08.2014 20:47:25
es\chill and ambient...		Ame Strong	Tout Est Bleu	00:03:44.078	363	19.08.2014 20:46:40
es\chill and ambient...		Ballistic Brot...	Uschi's Groove	00:03:25.818	363	19.08.2014 20:45:58
es\chill and ambient...		A New Funk...	Lubumba	00:04:56.071	363	19.08.2014 20:45:03
es\chill and ambient...		Les Negress...	Face A La Mer	00:05:41.681	363	19.08.2014 20:43:59
es\chill and ambient...		Electrife 101	Talking With M	00:07:04.202	363	19.08.2014 20:42:37
es\chill and ambient...		Cyberfit	Pojo Pojo	00:05:05.162	364	19.08.2014 20:41:37
es\chill and ambient...		Lamb	Transfatty Acid (Kr...	00:06:46.230	363	19.08.2014 20:40:23
es\chill and ambient...		Salt Tank	Angels Landing (Jo	00:05:36.744	363	19.08.2014 20:39:16
es\chill and ambient...		Paco Ferna...	Mani	00:05:13.025	363	19.08.2014 20:30:12
es\chill and ambient...		Wim Mertens	Close Cover	00:03:12.992	363	19.08.2014 20:29:28
es\chill and ambient...		A.R. Rahman	Mumbai Theme Tun	00:05:15.000	363	19.08.2014 20:28:53
es\chill and ambient...		Hightperson...	Easy Does it	00:09:50.973	335	27.01.2015 16:10:40
es\chill and ambient...		Healer	1000 Years	00:09:07.320	337	27.01.2015 16:10:34
es\chill and ambient...		sushi club	shiosai	00:06:47.306	350	27.01.2015 16:10:31
es\chill and ambient...		saafi brothers	fusedub	00:05:16.893	333	27.01.2015 16:10:26
es\chill and ambient...		halycon daze	esionjim	00:06:12.840	363	27.01.2015 16:10:24
es\chill and ambient...		samishi	naoki kenjj	00:04:12.373	363	27.01.2015 16:10:20
es\chill and ambient...		breeze	manmademan	00:06:13.800	364	27.01.2015 16:10:18

Found: 900 media items, Total duration: 3 days 20:04:45.092

In list mode, you can search for files according to the specified criteria, bulk change its properties, but cannot add new audio files or move, rename.

 Minimum file duration is 500 milliseconds.

When placing files in the media storage system *automatically*:

1. Checked for correctness
2. Corrects the volume level (reduced to normal by using ReplyGain formula)
3. Phase adjustment (if there is a constant component in the signal detected)
4. Checks for duplicates by complex criteria
5. For audio where possible, BPM speed is calculated and a rhythmic signal map (beat grid) is built
6. Set the start and end marks of the default fragment

...and other specifications to ensure quality and smooth sound.

It is important to note that the material is stored in the archive always in the form in which it was uploaded. The system works on the principle of minimal signal changes. But downloading files from the archive is physically impossible. This ensures security against illegal replication.


 Storage supports audio in formats: MP3, MP4, FLAC, OGG (Opus and Vorbis), WAV, with a sampling rate from 11khz to 96khz. Bit depth of sound – 8 to 32 bits

Stored files are automatically periodically checked for compliance with the original characteristics when they are added. If a file is found to be damaged, its status will be changed, and a corresponding notification will be recorded in the event log. Using such a file in playlists and templates will not be possible until the problem is resolved.

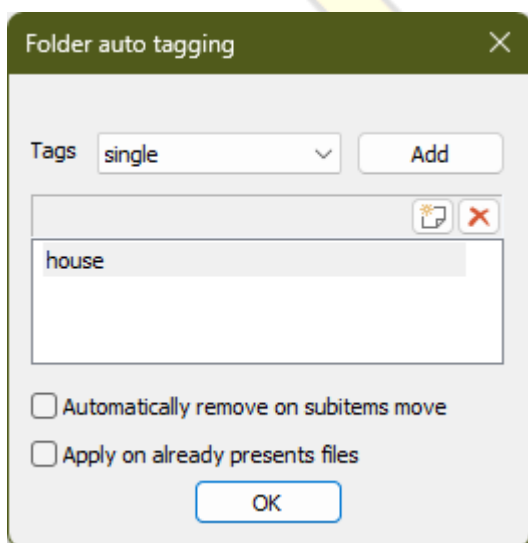
In addition, files are *automatically* tagged after upload with appropriate tags based on their duration:

Duration	Auto-tag
Up to 1 minute	<i>jingle</i>
Up to 12 minutes	<i>single</i>
Up to 1 hour	<i>mixset</i>
More than 1 hour	<i>liveset</i>

In addition to automatic, the user can use any number of their own tags. It is important to note that the user can use existing tags within his "scope". The scope is automatically generated from the sets of files that are in the archive and are available for a specific group (which account is member of). An exception to this rule is "new" tags. Those that are not yet in the entire system. You can assign them as you like.

 Tags consist of lowercase latin letters and numbers, without spaces or any other symbols.

There are tags that are a specific feature for the entire system by which it uses them for different purposes: *jingle*, *advert* – used to exclude the display of the corresponding files from the *now playing* line on the radio website. The system considers such files as *jingles* and / or *advertisements* that do not need to be visualized to the end user (listener). In the analytics and statistics, files with these tags are included (or vice versa excluded) from some types of reports for their construction without information noise and distortion.



the system has feature of automatic assignment of tags to media items that user "pre assigned" to folders. He does this in a cascade throughout the tree, submerging all the tags in the chain from mother to child. To open the this dialog, just right-click on the folder in tree and select the "Auto-tagging..." item in the context menu.

All media files uploaded to the folder now have the specified set of tags after they are analyzed.

In addition to *Tags*, each audio file in the system is has the following properties: *Artist*, *Track*, *File name*, *Duration*, *Speed* (number of beats per minute).

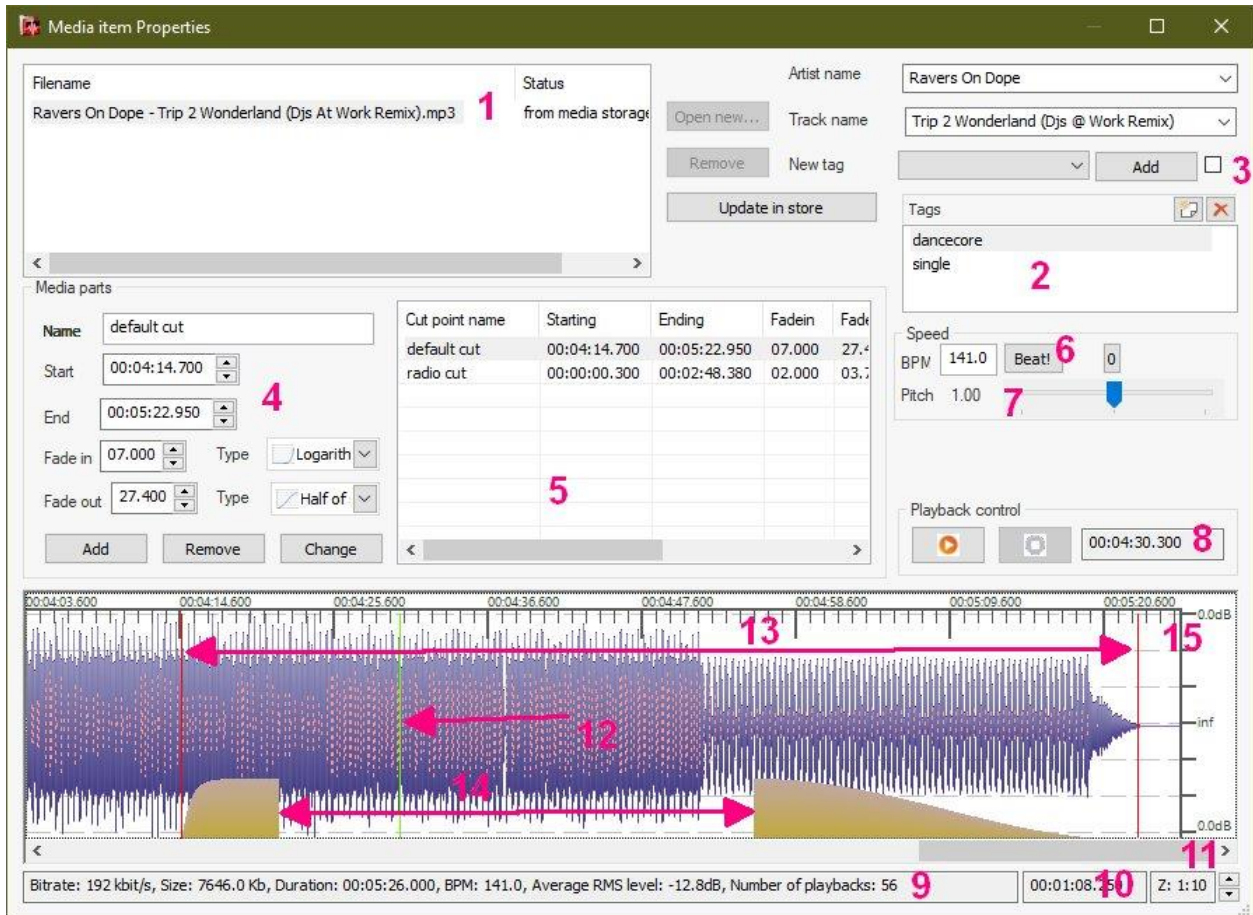
The user can split each file into an unlimited number of fragments, setting their own properties for each of them, including the start and end time of the fragment, the fadeout or fadein of the volume, as well as the characteristic of the volume envelope curve. One of the fragments of each media can be set as the default fragment. Default fragment will be used when automatically regenerating the playlist by system.

Dividing the file into fragments is a convenient mechanism that allows you to eliminate the costs of programming because it does not require the system operator to repeatedly: upload the source file to the local computer, process it in sound editors, encode and then upload finished file to system. All changes occur in the cloud with a couple of clicks at real-time.

Playing a fragment on the air is automatically recorded by the monotonically incrementing counter. The counter can be reset by going to the media storage menu (*Store -> Reset Play Counters*). Files in the archive can also be prelistened by those who have “*Prelistening*” access right in a special simplified (limited) quality, saving system resources, user bandwidth requirements for the Internet and preventing unauthorized grabbing stream copy. The level of quality available is set in the properties of a particular group where the account is included.

Media file detailed properties

Double-clicking on the name of the audio file in the archive opens a window with its detailed properties viewer and editor (who have “*Editing*” access right in store section):

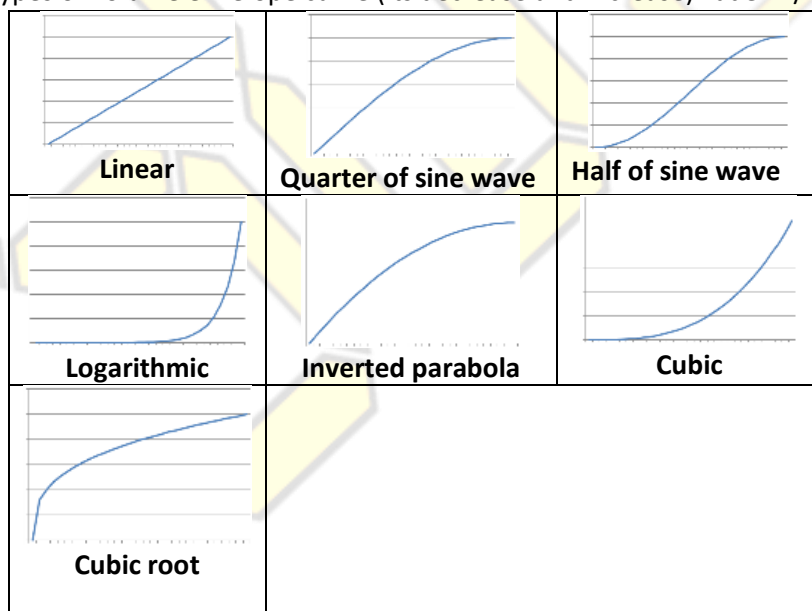


1. In 'add new files' mode this window lists multiple files prepared for uploading is displayed. In 'cloud mode' it allows to edit or view only single file properties.
2. List of tags that are assigned to the current file. The window displays the tags already assigned to this file, in the upper right part of the window - buttons for adding new and deleting old tags.
3. Lock tags button. Allows you to simultaneously mark any number of files with already predefined tags (the function is convenient to use when adding new files to the storage in bulk).
4. Properties available for editing at the current selected fragment in the list.
5. A list of all fragments of the audio file. Using the list, in particular, you can select the fragment that will be played by default.
6. Manual BPM counter. While automatic beat counter is fine, in some situations you may need manual count beats. When the *Beat* button is pressed, the counter starts counting the number of beats per minute. When adding a new file, a BPM track automatically detected by the system appears in this window. To disable the BPM using in various parts of system, set the value to 0 in the window.

7. Controls the speed (Deejays named this pitch) of playback. Allows you to evaluate the change in playback speed during the operation of the BPM automatic adjustment system.
8. Prelisten controls and current playback time display.
9. Main technical characteristics of the audio file.
10. Duration of selected fragment with markers start and end.
11. Zoom factor (scale). The degree of increase when displaying a graph of volume levels.
12. The current position of the playback marker.
13. Markers of the beginning and end of the fragment.
14. Indicators of fade durations (in + out) of the volume of the selected fragment.
15. Signal waveform.
16. Markers of the detected rhythmic pattern (beat) and its strength (height or bar).

Hot keys	
Keyboard shortcuts	Action
Shift + left / right arrows	Changes the duration of FadeOut or FadeIn segments. Which one is determined by the mouse cursor closer to the beginning or end of the fragment
Ctrl + left / right arrows	Changes the start or end points of a fragment. Which one is determined by the mouse cursor closer to the beginning or end.
left / right arrows	Changes the position of the playback marker
Space	Stops or starts playback from the start point of a fragment

The system provides 7 types of volume envelope curve (its decrease and increase) Fade in / out.

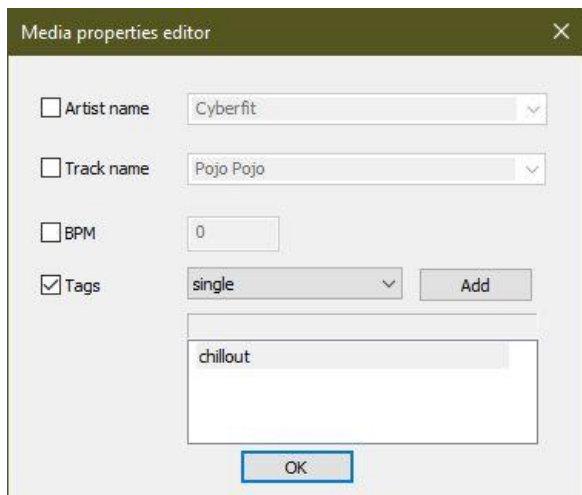


Direction of the curve will be reversed for Fade OUT effect.

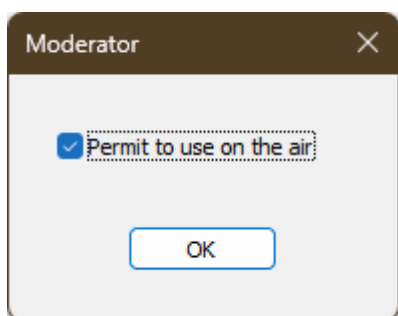
Working with item metadata

The system gives the user the ability to work with multiple selection of files at once. To do this, set the display mode of the media archive to *'list'*.

Select more than one item in the list, select "Properties" from the context menu and right-click. The following window will open:

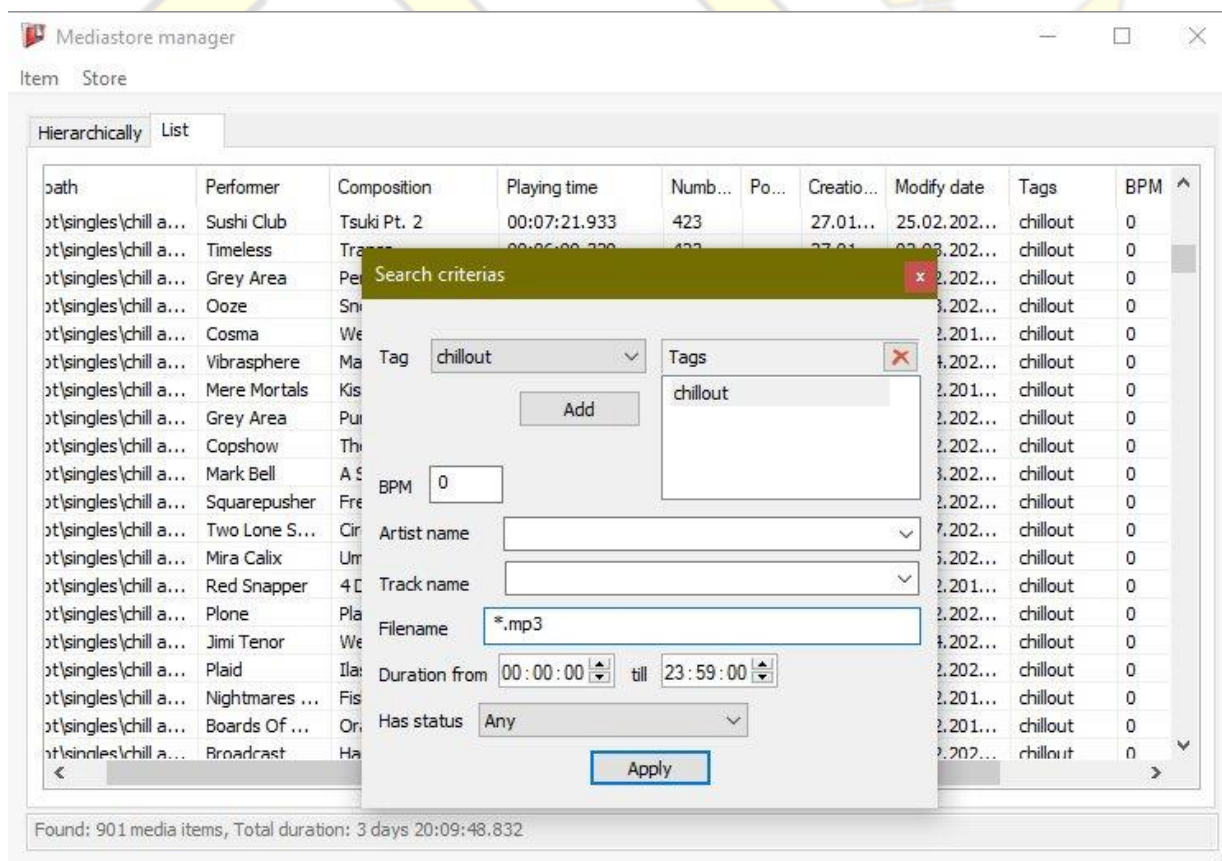


In this window, you can change certain properties - for example, change the tags for all selected elements, no matter how many.



Those who have the role of "Legal lawyer" in the system can call an additional dialog through the context menu that allows set permission whether the file has access to the air or not.

This allows you to have control over broadcast materials at one single point.



Search media storage for files

By selecting *Archive* -> *Search* Filter in the upper bar, the search window will appear on the screen. With it, you can select files according to various criteria. After closing the window, the filter will be “reset” (ie, the entire contents of the archive will be displayed). At the bottom of the search results window, in the status bar, the total number of files matching the query and the total duration will be indicated.

When searching by tags, the request is formulated as in the WWW search engines: by the query “+tag”, all files with the corresponding tag are displayed, by the query “-tag” all files where this tag is not present are displayed.

Adding files to media storage

There are two ways to upload files to the archive. Each defines speed of validation process:

1. Uploading files directly through the console (full client). In this case, the file is uploaded to system, its basic characteristics evaluated and placed in the queue for approval by administrators as quickly as possible. All file metadata necessary for its placement is prepared by the console and transferred to the server along with the file itself. This is fast way.
2. Uploading files via the web-interface. This method is longer and slower because the extraction of metadata and serious validation will be done on the server side and takes time.

The advantage of this console is that file processing is performed in parallel on several threads. To upload several files to the archive in parallel (up to 4 at a time) select them with the mouse and click on the "upload to archive" button.

General properties	
Creation date	13.03.2015 15:20:54
Modify date	13.03.2015 15:20:54
Playing time	00:08:37.381
Size (in KBytes)	8084
Bitrate	128
Status	Awaiting technical validation (

All uploaded content before receiving permission to go on the air must be approved first by the special role. To do this, the media storage has a separate interface where files are queued, listened by authorized administrators, who, having familiarized themselves with the material, give permission for it or prohibit. A file that has received administrator approval is assigned the “Available” status, which is displayed in the properties of this file. Only files with this status are available for use in

playlists and templates.

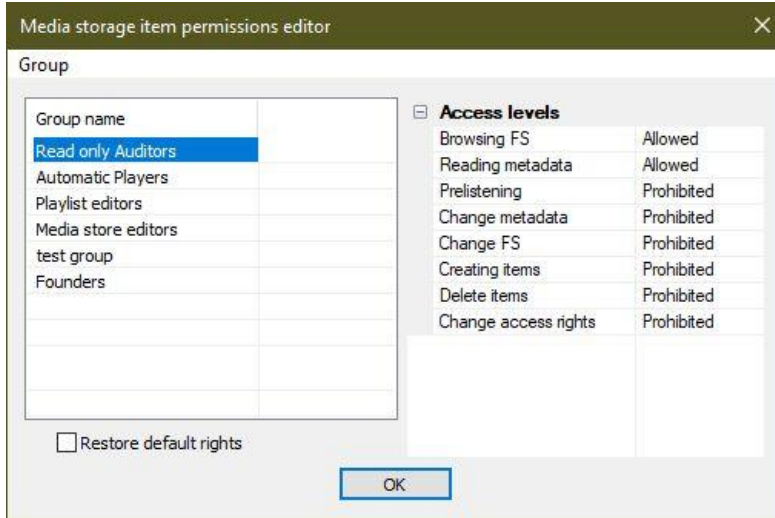
If the administrator prohibits the use of the file, it is not automatically destroyed, but remains in the archive so that in the future it would be possible to consider the reasons for the ban and, in case of an error fix it fast, thus minimizing time track’s access to the air.

General properties	
Creation date	13.03.2015 15:20:54
Modify date	10.12.2019 16:12:42
Playing time	00:08:36.597
Size (in KBytes)	12108
Bitrate	192
Status	Available


Editing media store access permissions

When working with media storage in hierarchy mode, it is possible to use a rights editor that regulates access rights to a separate directory (and its subdirectories). Remember - rights are assigned to folders not files in it. This is for simplicity.

To do this, select folder and open context menu selecting "*Property*". This will open security editor.

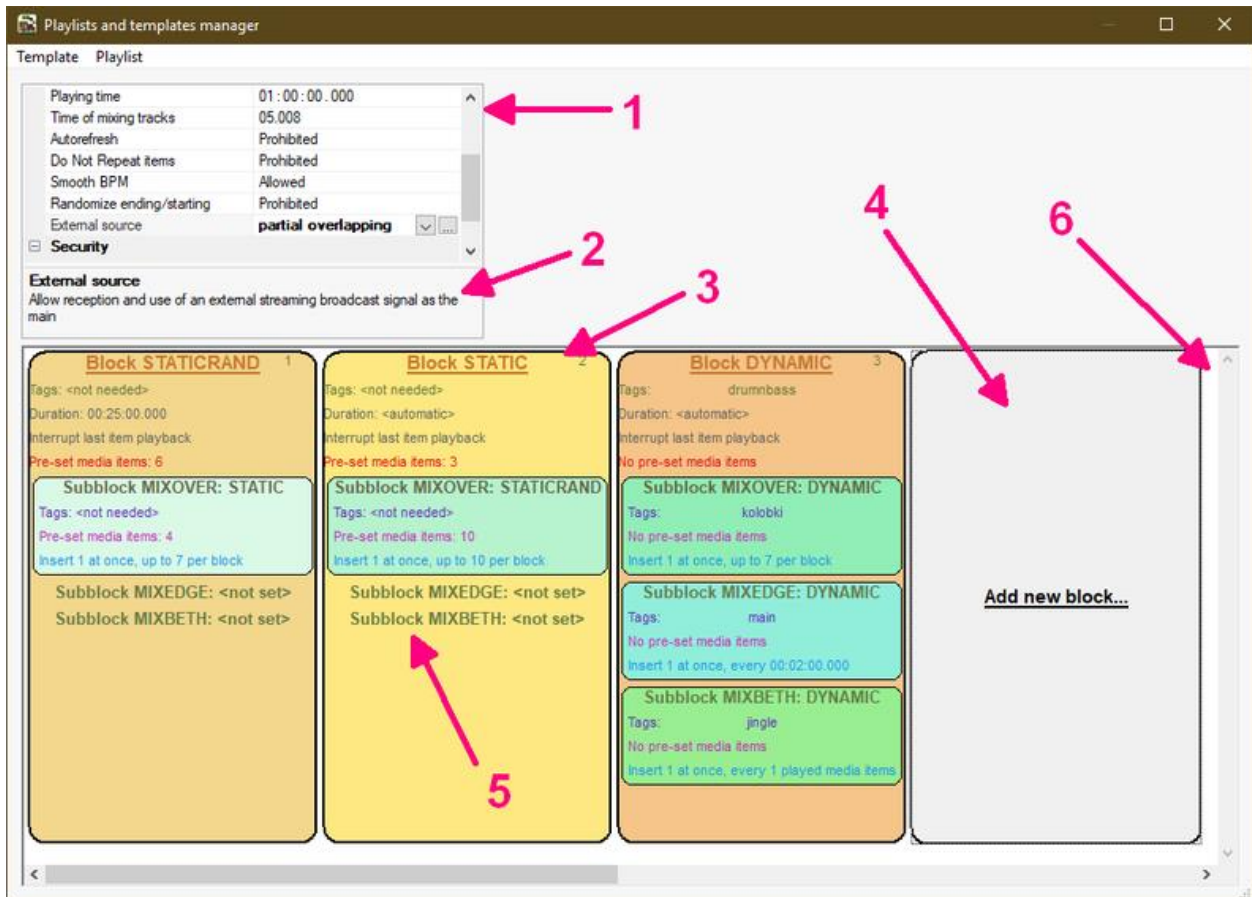


The "*Restore Rights*" checkbox, designed for ease of administration, allows you to assign the same rights in the current directory as in the parent one. It should be remembered that when this function is enabled, the explicitly assigned rights in this directory will be deleted.

 Users do not have the ability to change any access rights for the Founders group!

TEMPLATES

General view and characteristics



Description:

1. Properties of opened playlist template
2. Small description of selected property
3. Block. The top right corner show number of the block
4. Button to add new block to template timeline
5. Quick overview of major block characteristics
6. Chronologically ordered timeline of blocks

The system invented template technology to facilitate the compilation of complicated playlists very quickly. With minimal user-efforts.

A template - is a set of characteristics and rules that a user quickly defines. In accordance with them, the system compiles the playlist. That playlist latterly placed in broadcast schedule. Each template consists of an unlimited number of blocks. When compiling a playlist, blocks are processed by the system from left to right, sequentially. Blocks can be reordered manually (if needed).

In a typical broadcast station scenario you won't need to directly edit playlists at all.

Work with templates

- Blocks can be reordered with the mouse

- Using the CTRL key, you can select multiple blocks. In addition, standard actions (copying, deleting, etc.) can be performed with blocks using a standard set of keys
- Using the left / right arrow keys on the keyboard allows you to select blocks by moving the frame to the block you need at the moment
- To rename a template, enter a new name in the "Name" column, then select *Templates* -> *Save* from the top menu.

Characteristics of the template and their settings

Each template has a number of global properties that the user can adjust as he need. Later, some of these features can be overridden at the template level and at the unit level, which allows you to have finer control over template in accordance with the needed.

Feature name	Description
<i>Total duration</i>	Sets the desired duration of the playlist. The playing time specified in the template will take precedence over the time specified in the schedule of the radio station. If the playing time is not specified in the template (zero), the system will calculate required duration from the schedule for the current date each time a playlist is compiled
<i>Mixover duration</i>	Sets the mixing time of two consecutively playing tracks for the entire playlist. This value is overridable per-block. (T3 value in the illustration of the mixing process above)
<i>Autorefresh</i>	Enables automatic regeneration of this playlist according to the specified template when needed
<i>Avoid repetition</i>	When enabled, repeating tracks will be automatically excluded from the block. At the same time, if there are not enough audio files in the archive, the duration of the generated playlist will decrease compared to the required. This feature does not work within subblocks (mixover,mixedge,mixbeth)
<i>flatten BPM</i>	Enables an intelligent system for adjusting the speed of any tracks within the playlist. Rhythm may be different for each block. This feature is overridable per-block. Range is limited so that the rhythm of the sound does not become uncomfortable for the listeners
<i>Randomize beginning / ending</i>	Allows you to randomize or set fixed effect on the beginning and ending of each track. Choose from 5 effects: <ol style="list-style-type: none"> 1. FadeIN/FadeOUT (стандартный), 2. Pitch bend, 3. Delay (echo), 4. Pitch bend with FadeIN/OUT, 5. Delay(echo) with FadeIN/OUT. Please note the duration of the effect will not be exceed 5 seconds if it is not fadein / fadeout.
<i>External live source</i>	Enables of receiving an external streaming audio signal in real time from the broadcaster person specified in the schedule and additionally in playlist. There are 3 dedicated modes: <ol style="list-style-type: none"> 1 – Overlay (AS IS). For example playing long set without voice and DeeJay will overlay it with his real-time voice from mobile device.

	<p>2 – Partial overlapping. Replace all playlist content with live signal except events with special Jingle/Advertisement types. This will allow non skippable by DeeJay audio material.</p> <p>3 – Full overlapping. Completely replace playlist content with live signal when it is available. This is a dedicated live streaming with failover (playlist) when network issues encounter.</p> <p>Please note: live-signal will be smooth faded IN/OUT on each: source connection/disconnection, source timeout (network issues), playlist events. Duration of fade and its type is user-configurable</p>
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Since the system works in real time and adjusts to the conditions of the external signal, the problems of source instability will never lead to silence on the air.

If the connection with the external signal source is bad, the broadcast will automatically seamless return to the playlist via *Fade In/Out FX*, and the external source will be disconnected. Additionally this will auto extend amount of buffering to exclude problem in future. You can always see the graph of signal source stability in the corresponding statistics section. And of course take countersteps (change coder or its settings, lower bandwidth, etc).

All switching between external sources and the playlist are seamless and absolutely transparent for the listeners.

Possibilities of choosing elements in a template

Block Type property defines rules how the tracks will be located inside him.

STATIC	The user sets the list of audio files and the sequence in which they will be played
STATICRAND	The user sets a list of audio files that will be played by the system in random order
DYNAMIC	The user, use pre-tagged files, and sets only the tags that the system will choose for playback. By setting the " <i>-tag</i> " property, the user excludes from the selection the tracks marked with the corresponding tag. The " <i>+tag</i> " property, on the contrary, means that the system will include elements with a given tag in the playlist. As part of this selection, the user can also optionally specify a list of tracks that will be mandatory included in the playlist with an arbitrary distribution. Keep in mind: if one or more audio files are added to the playlist, the duration of which exceeds the playing time of the entire block, then no dynamic content specified by tags will be included in it

Upon compilation of playlist, the system evaluates the frequency of use of audio files, their freshness and popularity among listeners. You can change the 3-priorities of getting files from the archive into the playlist using the "Selection priorities" item in the **DYNAMIC**-type blocks. Thus, there will be no identical phonograms repeating too often on the air.

Specialized sub block types

Inside each block, there are special types of sub blocks where special purpose tracks can be placed. Among them: call signs radio station, jingles, commercials, advert, etc. The choice of each of them depends on yours. If desired, within one block, you can use all three sub-blocks types at once.

MIXOVER	<p>The specified media will be overlaid over the main tracks. The arrangement of elements is performed by any of 3 options:</p> <ol style="list-style-type: none"> 1. according to the total number of elements for the entire block 2. after a strictly regular time 3. no earlier than the next time
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MIXEDGE	The specified media will be inserted into the breaks of the main tracks. To create a gap in the audio, the effects specified in the properties of the currently playing tracks will be used. The placement rules are similar to the previous on.
MIXBETH	The specified media will be placed between the beginning and end of each N-th track. The number N can be set in the range from 1 to infinity

In the second and third types of sub blocks, you can use special audible flashes that mark the beginning and end of the corresponding sub block. It's called *Pre-roll* and *Post-roll*.

Different types of sub blocks are effective for various music materials in a playlist. For example, if a playlist contains recordings of live performances of a long duration, then it is effective to use the mixedge sub block to broadcast ads, and the mixbeth sub block, on the contrary, cannot be used, since it will not work if only one audio file is played in entire playlist.

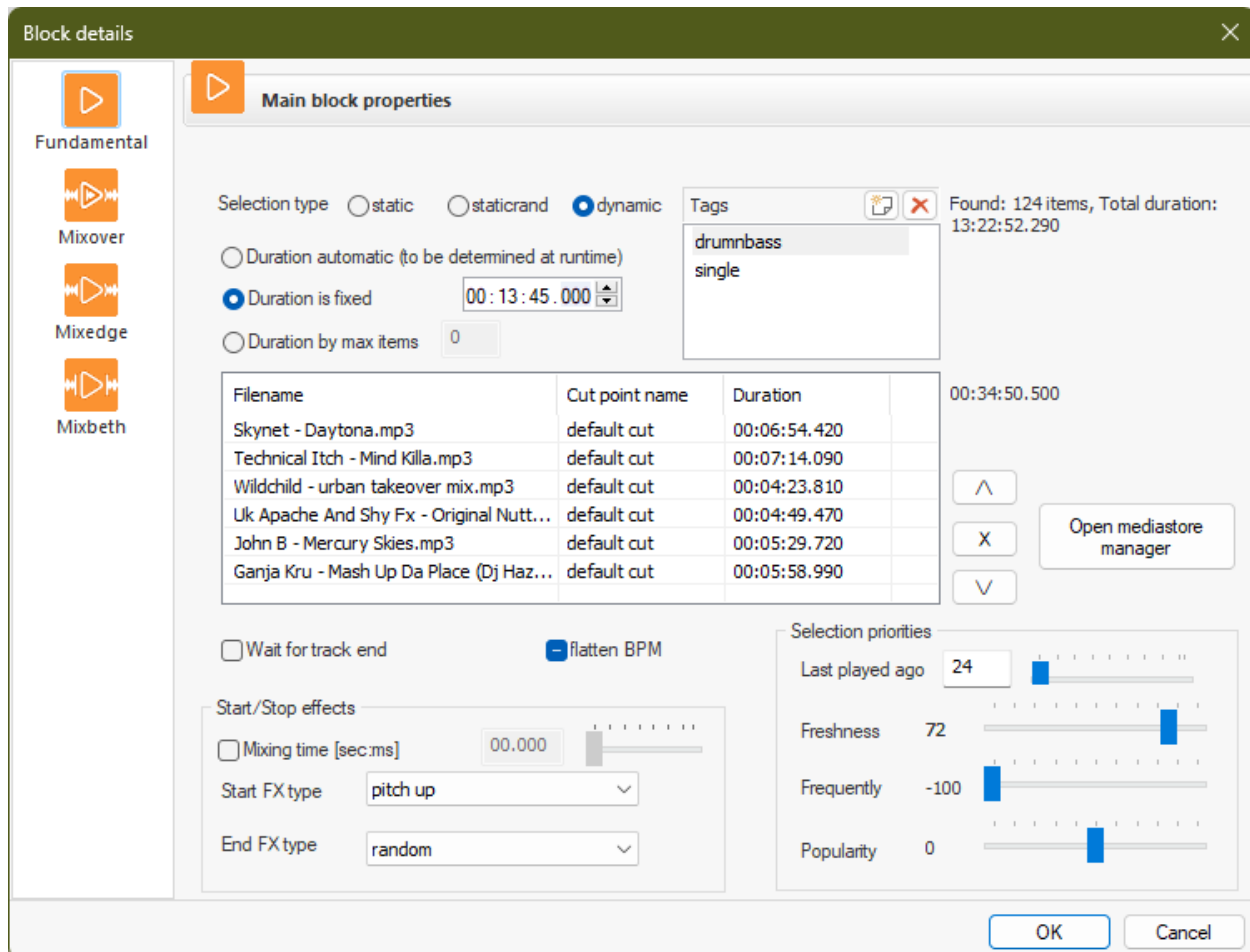
During automatic placement of audio files, if the duration of media is less than 1 minute, then it will be placed on a special FX turntable for jingles and advertisements. In addition, it will be excluded from the 'no repeat' mechanism in the playlist.

 When calculating the duration of the elements themselves, the time of the elements in the sub-blocks is not taken into account!

 Media specified in MIXOVER, MIXBETH, MIXEDGE *dynamic*-type blocks will be automatically ordered by least play count.

Editing Block Properties

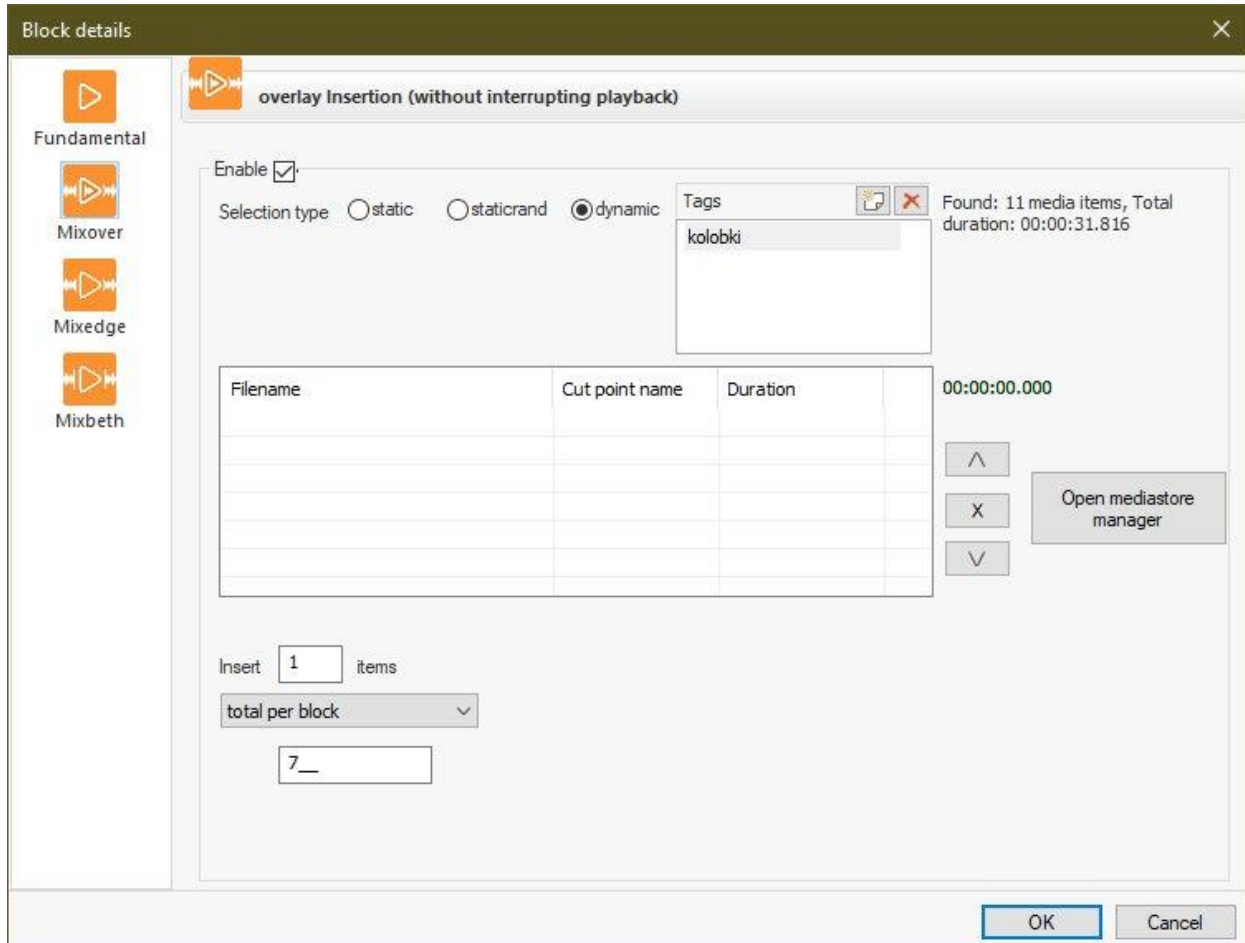
Double-clicking on a block opens a window with a detailed description of its properties divided into 4 main groups (*Basic properties, Mixover, Mixedge, Mixbeth*):



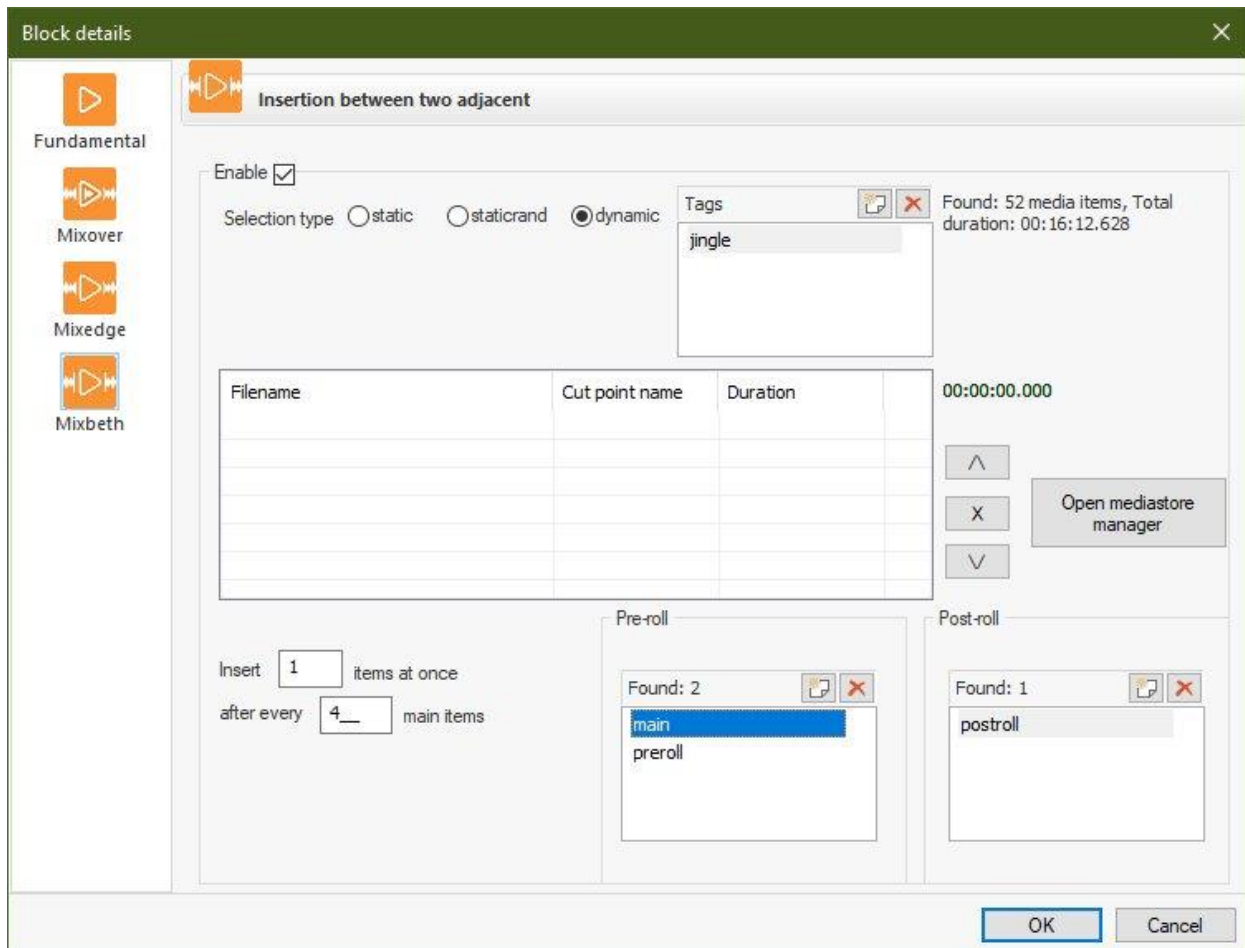
Description:

- «Wait for the end of the track». If enabled, the last track of the block will always be played to its end. To comply with the specified timing, the time will be subtracted from the subsequent blocks. If this item is not checked, the last track in the template will be trimmed (with FadeOut FX) if necessary to maintain duration. **Note: you cannot set this flag in the last block of the template!**
- «Duration». You can limit the duration of the block according to 3 conditions: automatic - the duration will be calculated automatically taking into account the remaining blocks in the template, overall duration of this block embedded media contents, by the maximum number of tracks. For example: you can get single random file from dynamic block, each time playlist is compiled. It's ideal place to inject radiostation signs on start of each hourly playlist!
- «flatten BPM». When the flag is set at this point, the system will always align the BPM; if it is absent, the alignment will not be performed. If the field is darkened, global BPM alignment setting will be used by default.
- «Beginning of the track»/«Ending the track». This parameter sets the effect used at the start and end each track in block. The parameter does not apply to sub blocks.
 - Volume Up\Down – standard fade effect will be used
 - Randomize – each time a randomly selected effect is used from the possible:
 - Pitch Up\Down – the effect of spinning or stopping the vinyl player by hand
 - Echo Up\Down – sound delay effect (echo creation)
 - Volume and pitch Up\Down – the effect of promotion or stop playback with a simultaneous increase / decrease in volume level from 0% to 100%
 - Volume and echo Up\Down – echo effect combined with increase / decrease in volume level from 0% to 100%

- «Mixing time». Allow you to override global mixing time between 2 tracks on a per-block basis
- «Open Media storage». This button provides quick access to the archive for transferring audio files, allowing you to quickly add audio files to the unit with the mouse (Drag N Drop)
- «Selection priorities». *Only used with DYNAMIC block type*. Allow you to fine-tune various priorities: between the oldest and the latest (by the date of adding to the mediastore), rarely played on the air and very often played, unpopular with listeners and very popular. And enforced excluding media that is played back fewer that specified number of *hours* last time (0 = disables filter, 744= up to one month).



- «Insert ... items». Defines the type of inclusion of elements from this sub block. Two distinct modes:
 - **Total per block** – sets number of maximum media items inserted per this main block
 - **As time passes** – after a fixed amount of time passed specified number of media items will be added
 - **Variable between** – after range (randomized between min and max) amount of time passed specified number of media items will be added
- «At once». Defines how many media items are added to the playlist at a time



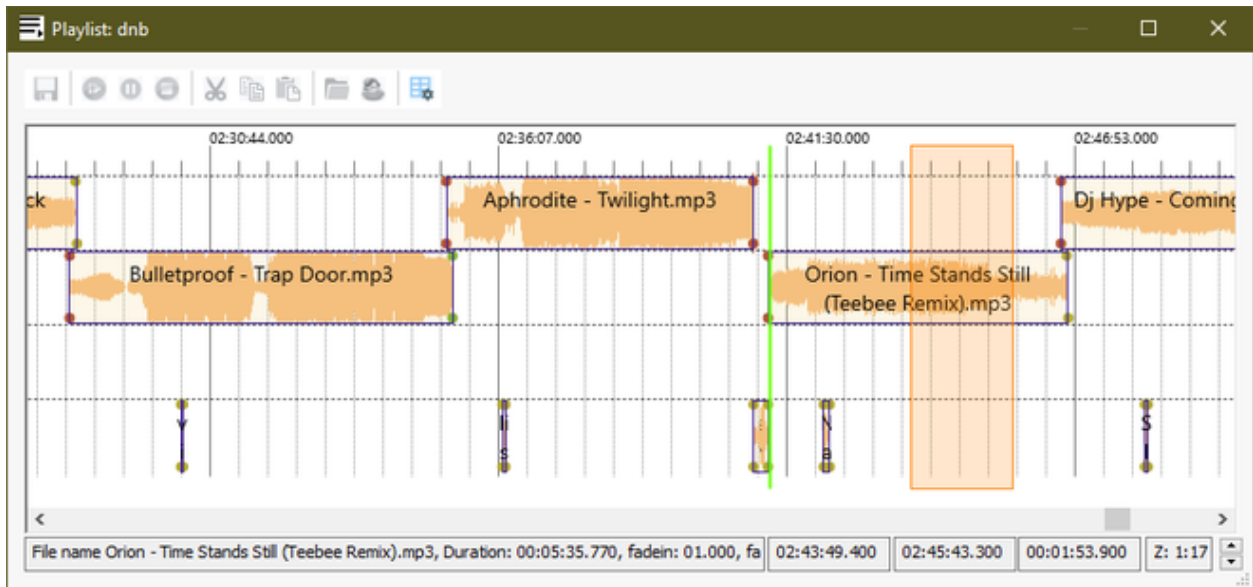
- «Preroll»/«Postroll». These windows include pre-roll and post-roll tracks framing the beginning and end of the respective sub blocks. Set only via tags, it always plays one single file at the beginning and one at the end.

A variety of parameters, options and settings for the playlist generator will allow you to compose a variety of playlists even with a minimum of materials in media store.

If the regeneration is checked in the template properties, the system automatically updates the playlist when the template is saved or each time before playlist is played on the air, as well as when the broadcast schedule changes. In this regeneration process, the system gently divides the required playing time between the blocks included in the template, with the exception of blocks whose fixed duration is set by the user.

PLAYLISTS

General view and characteristics

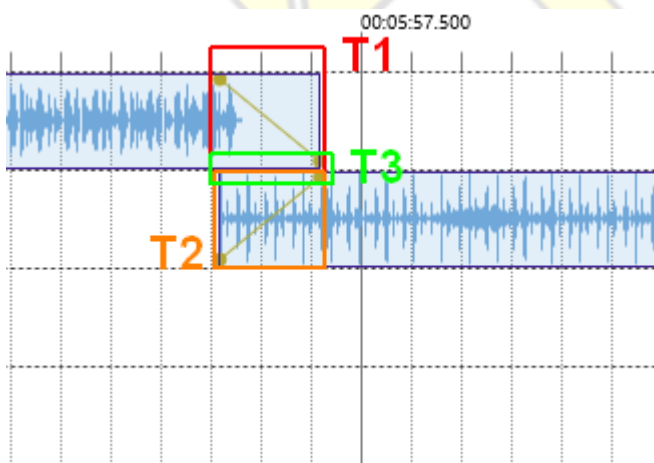


Working with playlists

Playlist - is a strict sequence of media items placed in the timeline in chronological order with the specified playback effects and events. Playlists, when ready to use, added lately to broadcast schedule.

 The maximum playing time of each playlist / template is limited to 24 hours.

Each playlist uses four completely distinct "vinyl turntables" (in reality, an unlimited number). Three of them are universal, that is, they can be used to place any media items. The fourth channel is special one. Dedicated specifically to accommodate short accompanying elements - such as jingles, beats, spots, advertising. On each turntable, you can place any tracks fragments from the archive that has status of "Available" in the system. Placed media fragments cannot overlap with each other within the same channel. For a smooth transition between one to another, two or more turntables are used (that's how it in real life). The system graphically displays such a transition as follows:



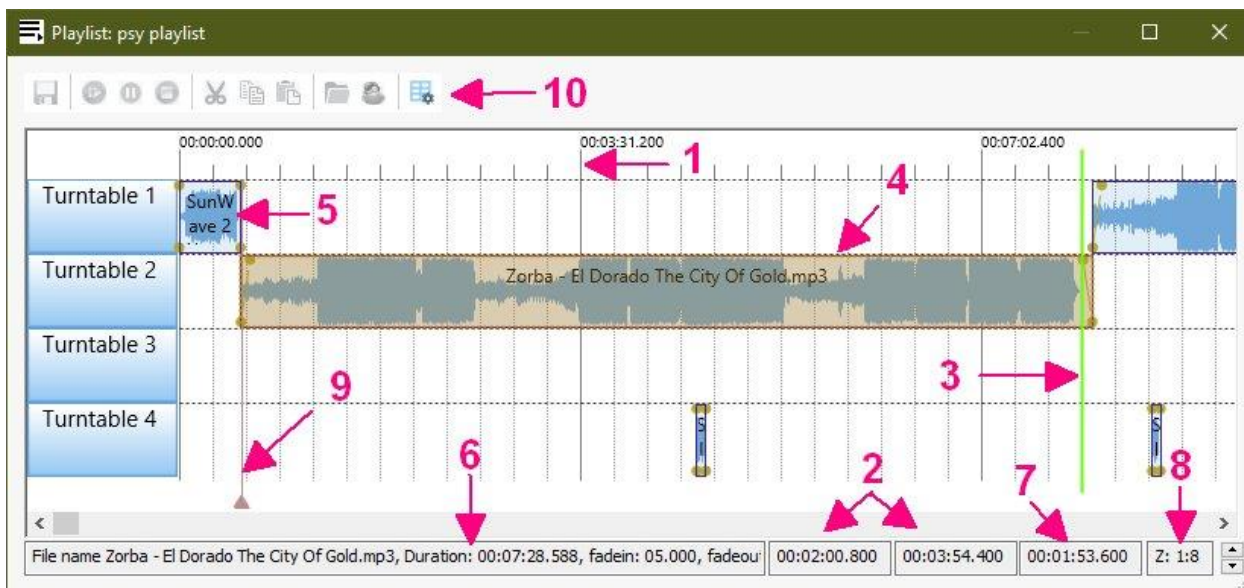
T1 – Time FX out is used.

T2 – Time FX in is used.

T3 – Time then two tracks are played (known to deejays as mixing time).


On Air control

The system allows you to monitor what is happening on the air in real time. To view account must have the right to read metadata on all media items in the playlist and the right to list this schedule item. If you have these rights, to view what is happening on the air, go to the *main menu* -> *Playlists* -> *Now playing*. After that, the window of the current playlist on air with a playback marker will open to your eyes:



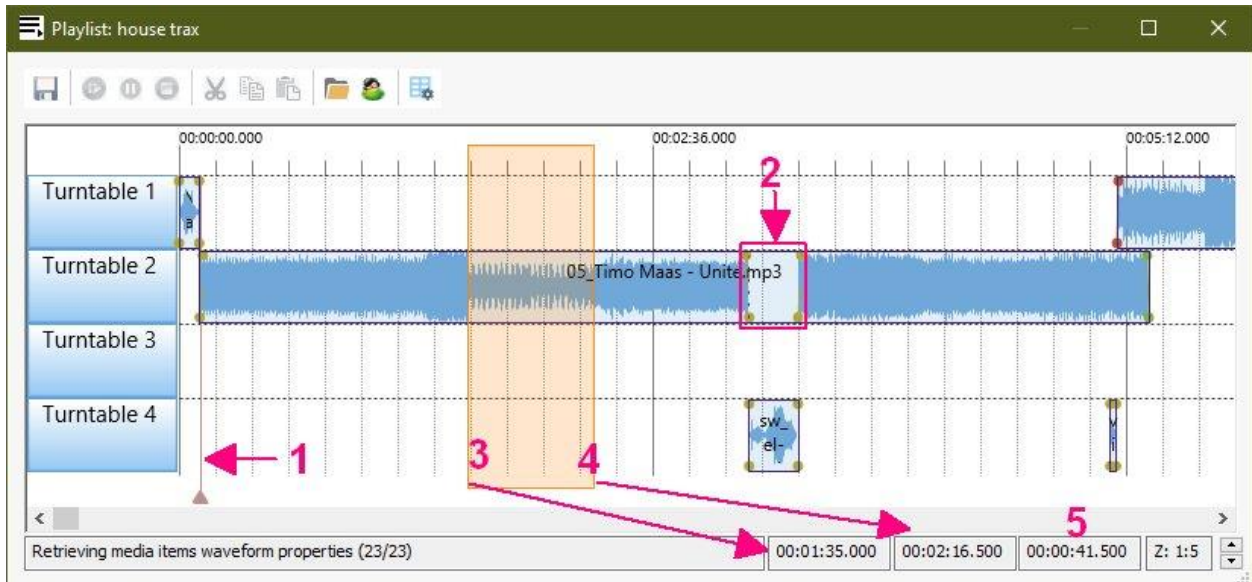
Description:

1. Time labels on a playlist timeline
2. The start and end time of the selected segment (if the time measurement tool is used)
3. The position of the current playback on the air. Shown only for the currently on-air playlist
4. Selected fragment of the media item
5. A fragment of an media item placed on track (unselected)
6. Brief characteristics of the selected fragment
7. Total playing time of the current playlist. When using the time measurement tool, shows the total length of the segment
8. The zoom factor. Shows the zoom level displayed by the playlist
9. Playlist end or block end markers
10. Tools menu quick shortcuts

 Accuracy of the playback marker is +- a few seconds. It is worth taking into account the peculiarities of buffering and the delays imposed by it (and network connection) when playing the stream of broadcasting. This results in the audible fragment may differ from the displayed cursor position due to this unpredictable situation.

Also please note that displaying waveform of realtime live stream signal from broadcasting person is not possible in playlist due to very complex circumstances.

To use the time measurement tool, click on the white field of the timeline. In this case, the system will show you the exact timestamp at that point. By clicking the mouse and holding the button during movement, you can find out the duration of the selected timeline interval. If necessary, you can use the time measurement tool using the keyboard. To do this, use the left / right arrows and the SHIFT key.



Description:

1. The start / end mark of each template block inside the playlist
2. The label of the media fragment that are switched to pause. After the pause, the track continues to play from the place where it stopped using smoothly FX-in. The color of the circles around rectangle indicates the type of FX effect will be used
3. The start time of the selected segment
4. The end time of the selected segment
5. The total time of the segment (if selected) or the total duration of the playlist

Media fragments in a playlist can be moved around the timeline using the mouse. If the selected item cannot be placed in a user-selected location, it will be automatically returned to its original location.

You can place new media fragments on the playlist timeline, using the mouse, transferring them from the open media store window. Use top menu quick buttons to open it.

The system allows you to have a playlist with many "live sources" at the same time (Dj jam sessions). To do this, simply add the accounts with the required broadcast permission to the playlist timeline. In this case, the "main" source will be the one indicated in the broadcast schedule.

BROADCAST SCHEDULE

General view and characteristics

A schedule is a central place where each playlists, performers and radio shows will appears. It is strictly tied to timestamps. The system makes it possible to program the broadcasting grid in advance for any period. Virtually your radio station can loop forever automatically generating playlists, allowing deejays doing live performance, and automagically renewal all this in schedule.

Displaying is possible in two different modes:

Calendar style:

Item	View	Addition					
All	Month	Week	Day				
17 июля 2023 г.							
	Пн 17 июл	Вт 18 июл	Ср 19 июл	Чт 20 июл	Пт 21 июл	Сб 22 июл	Вс 23 июл
0:00	auto dj - Chillout zone	Dj Siniquichi	auto dj - Chillout zone	Dj Siniquichi	auto dj - Ночи с Эмбиэнтот и чиллаутом	Dj Siniquichi	auto dj - Chillout zone
1:00		auto dj - Chillout zone		auto dj - Chillout zone			
2:00							
3:00							
4:00							
5:00							
6:00							
7:00	auto dj - morning traxxx	auto dj - morning traxxx	auto dj - morning psy	auto dj - morning traxxx	auto dj - morning traxxx	auto dj - morning traxxx	auto dj - morning traxxx
8:00							
9:00							
10:00	auto dj - dram und baze	auto dj - dram und baze	auto dj - dram und baze	auto dj - dram und baze	auto dj - dram und baze	auto dj - dram und baze	auto dj - dram und baze
11:00							
12:00							
13:00	auto dj - тра	auto dj - транцевалк	auto dj - Это	Nick Shankar &	auto dj - тра	auto dj - транцевалк	auto dj - транцевалк
14:00	Dj dUkk - Ге				Dj Earmack -		
15:00	Dj Proff & Dj Blend -	Dj Paul Sitter	auto dj - hardstyle	auto dj - hardstyle rhythms of the universe	auto dj - hardstyle	auto dj - har	auto dj - hardstyle
16:00		auto dj - Хаус музыка				Dj Volkov - H	
17:00	17:00 PM S		Dj H-Blast &		auto dj - Pyyyyyyyyyy	17:00 PM S	auto dj - Psy
18:00	18:30		auto dj - Хаус музыка	auto dj - веселая		18:30 auto	auto dj - Это
19:00	Dj Earmack -	auto dj - Psy					Dj H-Blast &
20:00	auto dj - Хау	Dj H-Blast &	Nick Shankar &	Dj SG - Drop	Dj Proff - Кач	auto dj - Хау	RisenCAT - Диссоциати
21:00	Dj Paul Sitter	auto dj - вес		Dj Volkov - H	Dj dUkk - Ге	Update Proje	
22:00	DJ Niflungar	Update Proje	auto dj - Хау	Alex Pusher	auto dj - вес	Dj SG - Drop	22:00-23:59
23:00	Dj Siniquichi	auto dj - Чил	Dj Siniquichi	П.С. Лесной	Dj Siniquichi	auto dj - Чил	Dj Proff & Dj

Very convenient and natural mode for human eyes. Scheduled items arranged by weeks horizontally and by time of the day vertically. Allows you to quickly understand what's going on and what will be next.

Calendar and list views are colored according to simple approach: day of week sets base color, daily hour's sets tone of base color and visibility flag adds gray.

This scheme allows you to immediately determine the type of schedule item by eye.

As colorful list:

The screenshot shows the 'Timetable manager' application window. At the top, there are tabs for 'All', 'Month', 'Week', and 'Day', and a date selector set to '29 декабря 2021 г.'. Below this is a grid with columns for 'Start Date/Time', 'Block name', 'Broadcaster', and 'Creation date'. The grid contains various broadcast entries with different background colors. An 'Auto renew configuration' dialog box is open in the center, showing 'Timerange' set to 7, 'Days (0 - to shut off)', and 'Timestamp of renew' set to 3 мая 2021 г. with an 'OK' button.

Start Date/Time	Block name	Broadcaster	Creation date
21.11.2021 13:00:00	дневной хаусек	usr1	15.11.2021 13:30:00
21.11.2021 10:00:00	понедельник утренний чил	test account	15.11.2021 13:30:00
21.11.2021 04:40:00	ночной chillинг	dUkk	15.11.2021 13:30:00
21.11.2021 01:00:00	psy trance night	auto dj	15.11.2021 13:30:00
20.11.2021 20:00:00	жесткий хардкор	auto dj	15.11.2021 13:30:00
20.11.2021 16:00:00	полуденный перерыв	liveuser	15.11.2021 13:30:00
20.11.2021 13:00:00		usr1	15.11.2021 13:30:00
20.11.2021 10:00:00		test account	15.11.2021 13:30:00
20.11.2021 04:40:00		dUkk	15.11.2021 13:30:00
20.11.2021 01:00:00		auto dj	15.11.2021 13:30:00
19.11.2021 20:00:00		auto dj	15.11.2021 13:30:00
19.11.2021 16:00:00		liveuser	15.11.2021 13:30:00
19.11.2021 13:00:00		usr1	15.11.2021 13:30:00
19.11.2021 12:00:00		auto dj	19.11.2021 12:11:2
19.11.2021 10:00:00		test account	15.11.2021 13:30:00
19.11.2021 04:40:00	ночной chillинг	dUkk	15.11.2021 13:30:00
19.11.2021 01:00:00	psy trance night	auto dj	15.11.2021 13:30:00
18.11.2021 20:00:00	жесткий хардкор	auto dj	15.11.2021 13:30:00
18.11.2021 16:00:00	полуденный перерыв	liveuser	15.11.2021 13:30:00
18.11.2021 13:00:00	дневной хаусек	usr1	15.11.2021 13:30:00
18.11.2021 10:00:00	понедельник утренний чил	test account	15.11.2021 13:30:00
18.11.2021 04:40:00	ночной chillинг	dUkk	15.11.2021 13:30:00
18.11.2021 01:00:00	psy trance night	auto dj	15.11.2021 13:30:00
17.11.2021 20:00:00	жесткий хардкор	auto dj	15.11.2021 13:30:00
17.11.2021 16:00:00	полуденный перерыв	liveuser	15.11.2021 13:30:00
17.11.2021 15:30:00	seq	auto dj	17.11.2021 11:41:2


Each position in the grid is highlighted with specific color depending on the time of day and day of the week. The days of the week differ from each other in the main color, and the evening hours differ from the morning, in a lighter tone.

The radio grid is grouped according to four time criteria:

1. All filled schedule
2. Month
3. Week
4. Day

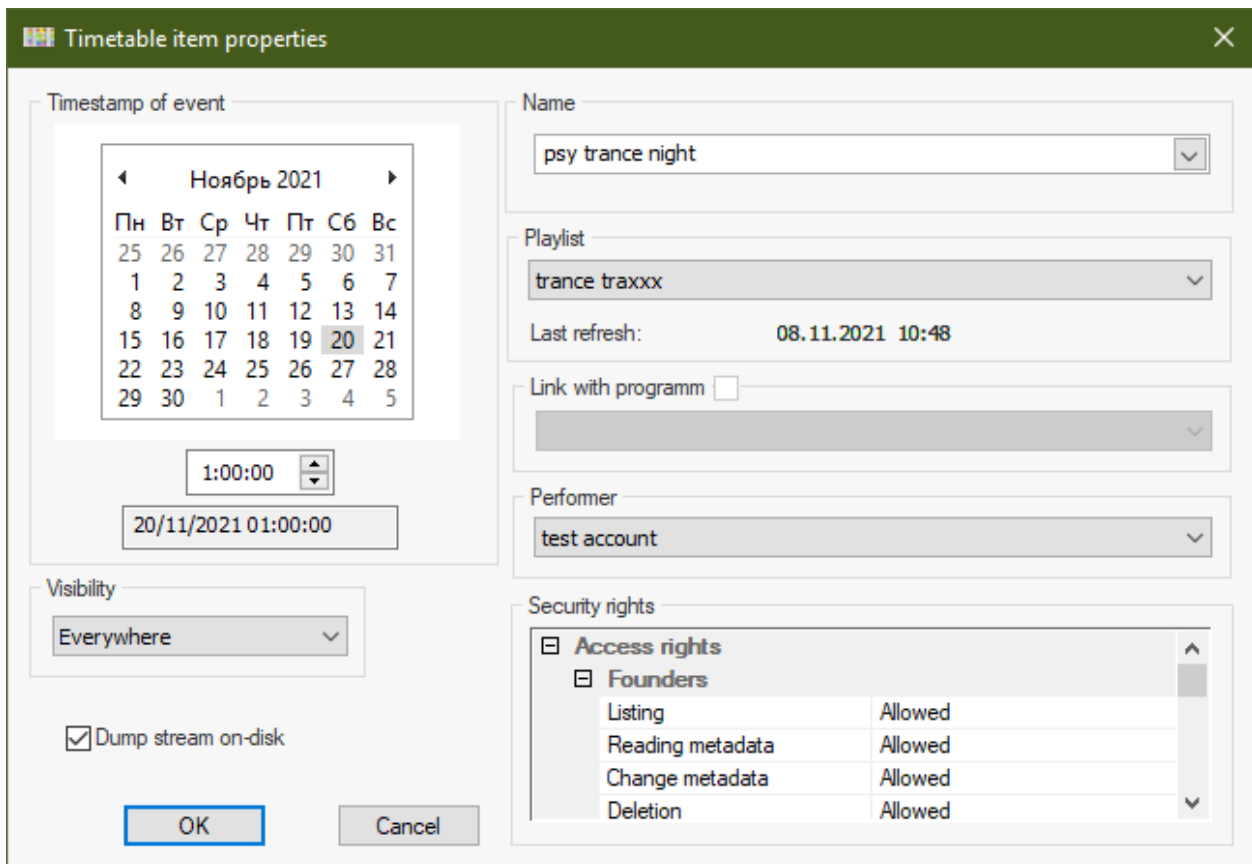
Use calendar located to the right of the corresponding buttons of the section menu to set grouping mode.

The system provides the ability to automatically extend the existing broadcast schedule for an arbitrary time in advance. In order to enable this function, go to the *top menu* -> *Configure Auto-Renew* and specify a non-zero time interval during which already past programs will be broadcast in the same sequence. The maximum interval that can be specified is 180 days from the setup date. The system will automatically repeat the specified sequence of programs until the next setting change.

 To configure auto-renew, a user must be a member of a group that has full access to the schedule section.

Set up events on the schedule

By double-clicking on any item on the schedule, a window with detailed event properties opens:



Ноябрь 2021						
Пн	Вт	Ср	Чт	Пт	Сб	Вс
25	26	27	28	29	30	31
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	1	2	3	4	5

Access rights	
Founders	
Listing	Allowed
Reading metadata	Allowed
Change metadata	Allowed
Deletion	Allowed

Description:

- **Name** – The name of the program used
- **Playlist** – Selected by the user from the pre-populated list of playlists. When the "Autorefresh" function is enabled in the properties of the playlist template, the playlist is regenerated automatically each time before use
- **Link with radioshow** – If a certain program is broadcasted on the specified date and time, you should associate an event with it
- **Performer** – This person must have right to broadcast. Additionally it will enable ability to go on air at this time for this person. A special module named SWBS Livcaster will bring the presenter on the air and put him out in time
- **Dump stream on-disk** – Determines is this event will be completely recorded by server or not. Option is very convenient to do automatically recording of live-streaming performances and not consume too much of server storage. The copy is made after the final mastering of the signal and before it is sent to the output. Those dump will be produced with OGG OPUS codec and can be optionally attached to media store (see *system settings*). The files are located in the directory configured by the administrator of the server with the broadcasting system installed. In another terms, it can be called "police recording of the ether".
- **Visibility** – Determines the degree of availability of event information. There are three possible settings

EVERYWHERE	The event will be visible both on the website of the radio station and in the system. (and be processed)
-------------------	--

ONLY HERE	The event will not appear on the website of the radio station, but will be used by broadcast system
ONLY PUBLIC	The event will only be visible on the site of the radio station, but will be completely ignored by system

Changes to the air schedule


You can create new events in schedule of the air. After you binds them to a specific playlist, Broadcaster and radio show (optional), they will be broadcasted at the appropriate time. A program that has been scheduled before the start of the broadcast will be aired on the same day. If its start time has already passed, it will be played starting from the next day.

In addition, the system makes it possible to urgently broadcast the program after start time passed, but before the time of its schedule ended. For example, if a program is scheduled to be broadcast at 10.00, and its planned duration is 1 hour, it can be broadcasted at any time from 10.01 to 10.59. At the same time, it will end at the scheduled time, and accordingly, its duration will be reduced to fit into schedule.

You have the opportunity to force playback of the current playlist on the air. For example, if you understand that you made a mistake in the current playlist, use the top menu item "*General -> Reread Schedule*". A dialog will be displayed asking where to start playing the current playlist: from the "zero" mark or from the current time offset in the old playlist.

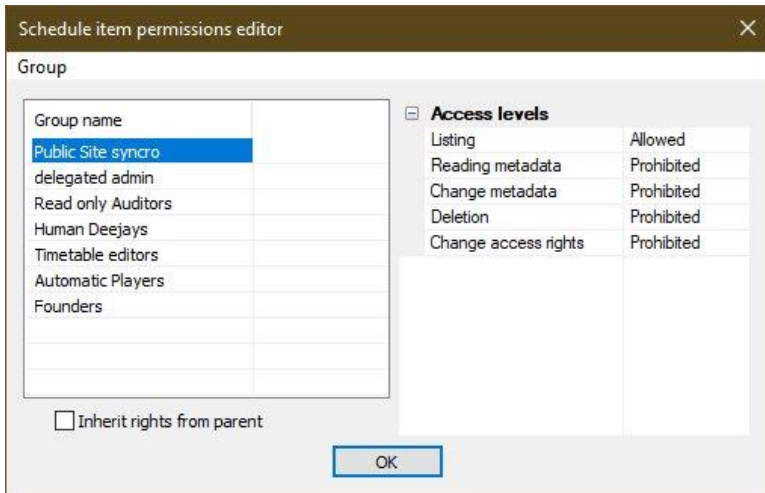
Programs without real life broadcaster person set, will be broadcasted by internal account named AutoDJ (by default, but you can change it!).

Before playing, if the corresponding property is specified in template settings system performs automatic playlist regeneration. If no events after the current one are present in the schedule, the playlist will be played on air in a loop until a new event added in the schedule. And playlist duration (if not set by template) will be limited to 24 hours.

 The automatic duration of the playlist determined by: 1. period in the broadcast schedule 2. its own properties (preferred). If you want the duration to match the schedule, you should set the duration in the template to 0. If the duration of the playlist is longer than the interval allotted in the schedule, it will be cut out in time. If duration of playlist is lower than schedule interval, it will be looped over (restarted).

Before on the air playlist ends and a new one starts according to the schedule, a smooth *FadeOut* of the last sounding tracks in it will be produced. The interval during which this will be performed is read from currently on air mediafile fadeout time. System will gently do fading ahead so when starting new playlist no sounds from previous playlist is produced on air.

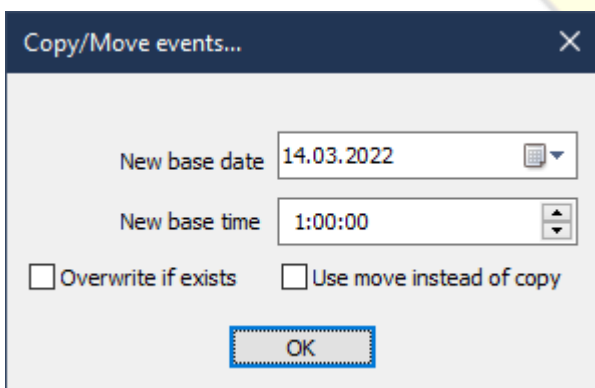
Permissions that is available while working with schedule



Different user groups have different rights to change, add and delete certain items on the air schedule. Only the owners of the *Security Change* access level can change group rights.

You can use multiple selection of several events to assign rights or delete events. To edit event properties - the selected element must be strictly one.

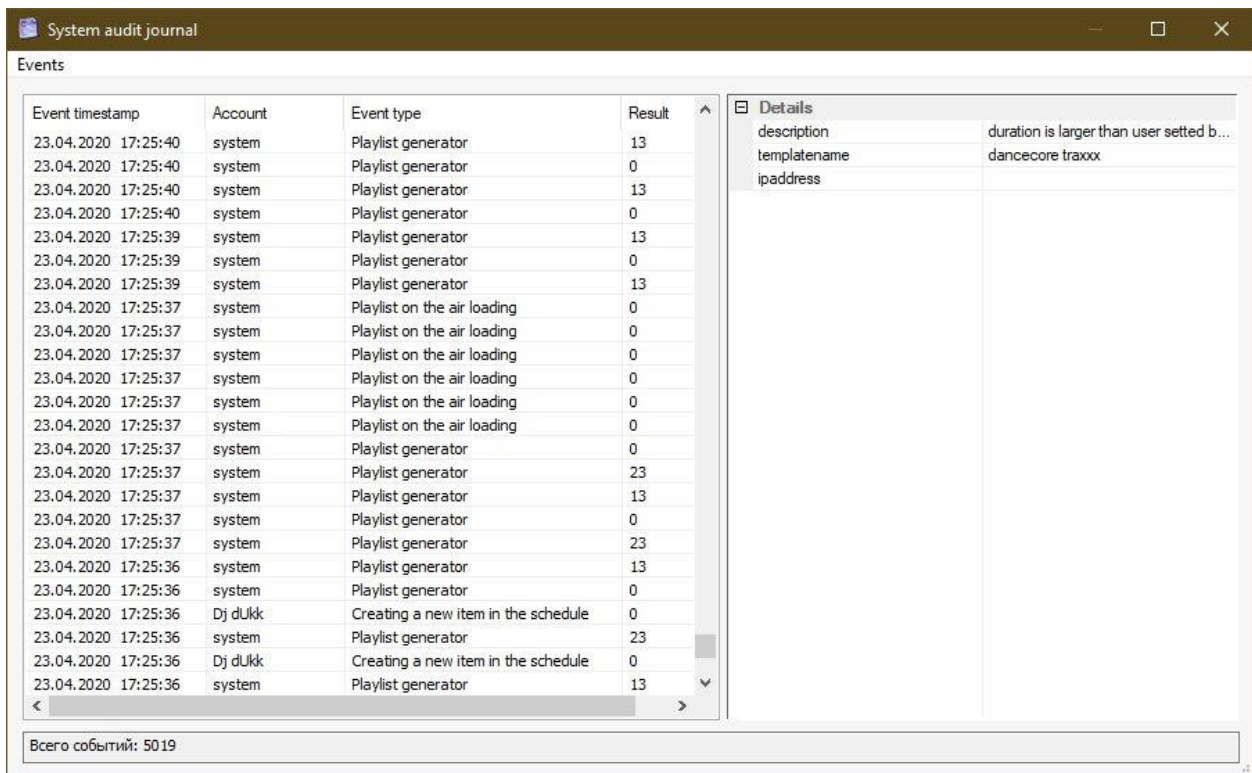
If the current display type of schedule is a list, then you can use the cloning (copying/moving) tool for the schedule. This is convenient if you do not want to resort to a schedule auto-renewal mechanism and need to quickly copy or move scheduled events.



Wizard can overwrite event properties in case on destination (calculated) timestamp some event already exists. Or it can do moving instead of copying.

AUDIT JOURNAL

General view and basic properties

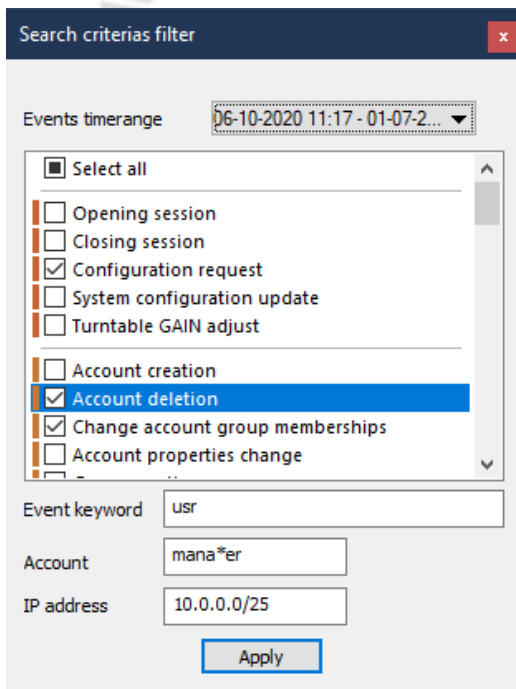


The screenshot shows the 'System audit journal' window. It features a table of events and a details pane on the right. The events table has columns for Event timestamp, Account, Event type, and Result. The details pane shows fields for description, templatename, and ipaddress.

Event timestamp	Account	Event type	Result
23.04.2020 17:25:40	system	Playlist generator	13
23.04.2020 17:25:40	system	Playlist generator	0
23.04.2020 17:25:40	system	Playlist generator	13
23.04.2020 17:25:40	system	Playlist generator	0
23.04.2020 17:25:39	system	Playlist generator	13
23.04.2020 17:25:39	system	Playlist generator	0
23.04.2020 17:25:39	system	Playlist generator	13
23.04.2020 17:25:37	system	Playlist on the air loading	0
23.04.2020 17:25:37	system	Playlist on the air loading	0
23.04.2020 17:25:37	system	Playlist on the air loading	0
23.04.2020 17:25:37	system	Playlist on the air loading	0
23.04.2020 17:25:37	system	Playlist on the air loading	0
23.04.2020 17:25:37	system	Playlist on the air loading	0
23.04.2020 17:25:37	system	Playlist generator	0
23.04.2020 17:25:37	system	Playlist generator	23
23.04.2020 17:25:37	system	Playlist generator	13
23.04.2020 17:25:37	system	Playlist generator	0
23.04.2020 17:25:37	system	Playlist generator	23
23.04.2020 17:25:36	system	Playlist generator	13
23.04.2020 17:25:36	system	Playlist generator	0
23.04.2020 17:25:36	Dj dLukk	Creating a new item in the schedule	0
23.04.2020 17:25:36	system	Playlist generator	23
23.04.2020 17:25:36	Dj dLukk	Creating a new item in the schedule	0
23.04.2020 17:25:36	system	Playlist generator	13

Всего событий: 5019

The system completely and in detail keeps a log of all actions of both itself and all accounts. Each operation in the system has its type, operation result, parameters and timestamp of event generation.



The screenshot shows the 'Search criteria filter' dialog box. It includes a search criteria filter, an events timerange, a list of event types with checkboxes, and input fields for event keyword, account, and IP address. An 'Apply' button is at the bottom.

Search criteria filter

Events timerange: 06-10-2020 11:17 - 01-07-2...

Select all

- Opening session
- Closing session
- Configuration request
- System configuration update
- Turntable GAIN adjust
- Account creation
- Account deletion
- Change account group memberships
- Account properties change

Event keyword: usr

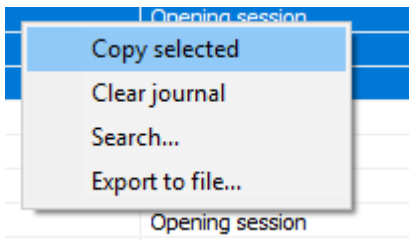
Account: mana*er

IP address: 10.0.0.0/25

Apply

You can use the search by various criteria's (including keywords used in event details, ip address from command is issued, account who doing changes):

In addition, you can clear the entire operation log or export events (all or selected) to a local file.



GLOBAL SYSTEM SETTINGS

General view and characteristics

The screenshot shows the 'Global configuration' window with the following sections:

- Central unit:** A list of codecs with their activation status:
 - MPEG-1 L3 (MP3):** Activate: True
 - MPEG-4 AAC:** Activate: False
 - Vorbis:** Activate: False
 - Opus:** Activate: False
- Limiter and Maximizer:** Four circular sliders and two input fields:
 - Top-left: Slider from -24 to 0, value at -18.
 - Top-right: Slider from -9 to 9, value at 3.
 - Bottom-left: Slider from 101 to 451, value at 201.
 - Bottom-right: Slider from -30 to 0, value at -18.
 - Input fields: Threshold (-30.0), Input Gain (-2.0), Release time (500.0), Output Ceiling (-1.0).
- Live performance:** A table showing current settings:

Codec	
Type	FLAC
Bitrate	64
Quality	10
Stereo submode	Stereo
Encoding mode	CBR
Transmitter	
Address	api8.swbs.local
Port	80
- Turntables GAIN:** Four vertical sliders with 'Set' buttons below them:
 - Slider 1: Value -16.4C
 - Slider 2: Value -30.4C
 - Slider 3: Value 3.20 (highlighted with a dashed box)
 - Slider 4: Value -16.0C

An 'Apply' button is located at the bottom center of the window.

This section sets the parameters of the output (master-out) codecs, output transmitters, peak limiters, maximizers, address of the public signal reception point for live and automatic broadcasts.

 All parameters applied in real-time with few seconds without restarting the broadcast system!

The system supports parallel output of the master signal in the 4 most popular streaming formats:

- ✓ **MPEG-4 Audio (AAC ATDS),**
- ✓ **MPEG1-Layer III (MP3),**
- ✓ **Vorbis** in containers **WebM** or **OGG**,
- ✓ **Opus** in containers **WebM** or **OGG**.
- ✓ **PCM out** on supported Linux soundcards.

And simultaneously dump recorded stream to disk file in **OGG OPUS** format.

The user can independently configure various encoding parameters in each codec.

CODEC	Description of the "quality" parameter
MPEG-4 AAC	The parameter sets the encoding quality and mode (0 and 6 - CBR, you can specify the bitrate, the rest is - VBR). Starting from 6, the mode of enhanced encoding quality (high CPU load) is activated. 1,7 ~ 20kbps, 2,8 ~ 32kbps, 3.9 ~ 48kbps, 4,10 ~ 64kbps, 5,11 ~ 96kpbs. Technically speaking this is ADTS stream over HTTP.
MPEG-1 Layer III	In CBR and ABR modes, sets the encoding quality. 9 - Highest, but requiring a more CPU resources. 0 - the worst, but not requiring a large CPU resources. In VBR mode, it sets both quality and encoding bitrate at the same time. (0 is the smallest bitrate and minimum CPU load, 9 is the largest bitrate and quality, but at the cost of a large CPU load).
Vorbis	The parameter sets t. (0 is the smallest bitrate and minimum CPU load, 9 is the largest bitrate and quality, but at the cost of a large CPU load).
Opus	The parameter sets the encoding quality. 10 - Highest, but requiring a more CPU resources. 0 - the worst, but not requiring a large CPU resources.
PCM Soundcard	The parameter is not used here at all. The version of the codec itself is used to output sound through the central hardware sound card installed in the system where the service is running. Choice one from 3 available backends: ASLA, OSS, PulseAudio

Please note and when you change output parameters -> connection to specified Icecast server will be re-established because codecs except OPUS won't allow changing anything without stream restart. Only OPUS will allow on-the-fly seamless changing bitrate or quality.

 be noted about some "features" of codecs and container formats:

- **OGG-container** increases the latency at low bitrates quite a lot due to the fact that there is a minimum size of data sent (4Kb).
- **Vorbis** codec also increases latency. This codec requires at least 4k samples for normal encoder operation.
- **AAC-MPEG4** codec also increases latency. This codec requires at least 5k samples for normal encoder operation.

If you need broadcast recordings, you can configure its parameters here. Codec in which broadcasts are written – **OGG OPUS**.

<input type="checkbox"/> Dump to file	
Activate	True
<input type="checkbox"/> Codec	
Bitrate	24
Quality	5
Encoding mode	CBR
Place in mediastore	0.53535

The directory where the files themselves are saved on the server is specified through the configuration file by server administrator. Here you can configure the codec params, the placement path in the virtual media storage and enable its attachment.

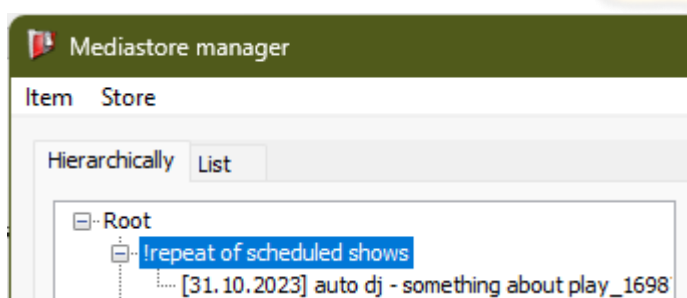
This is an optional step. If you do not specify anything in the “place in storage” column (empty), then the files will only be stored on the server’s file system itself but will not be automatically placed in the media storage. The parameter value is the address of the virtual directory in the media storage. You can view it in the mediastore explorer.

After setting up and turning on, all you need is enable record for the required programs in the broadcast schedule

Dump stream on-disk

The name of the files on the file system is automatically formed from the timestamp of the schedule of the recorded program and the time stamp of the current time when the recording began.

The names of the files in the media storage contain all the basic information about the transfer of the recorded



Automatic recording is a convenient and useful function necessary for automating replays of live radio shows as well as “control recording” of the broadcast..

Although the **Vorbis** codec is not included in the Live Stream preferences, it is supported for **libshout**-compatible live sources.

Additionally you can set near-realtime final output mastering settings (Maximizer, Limiter).

If you think that input gain levels needs to be adjusted on some turntable - do it from this interface. Set fader to desired level and click Set button under it.

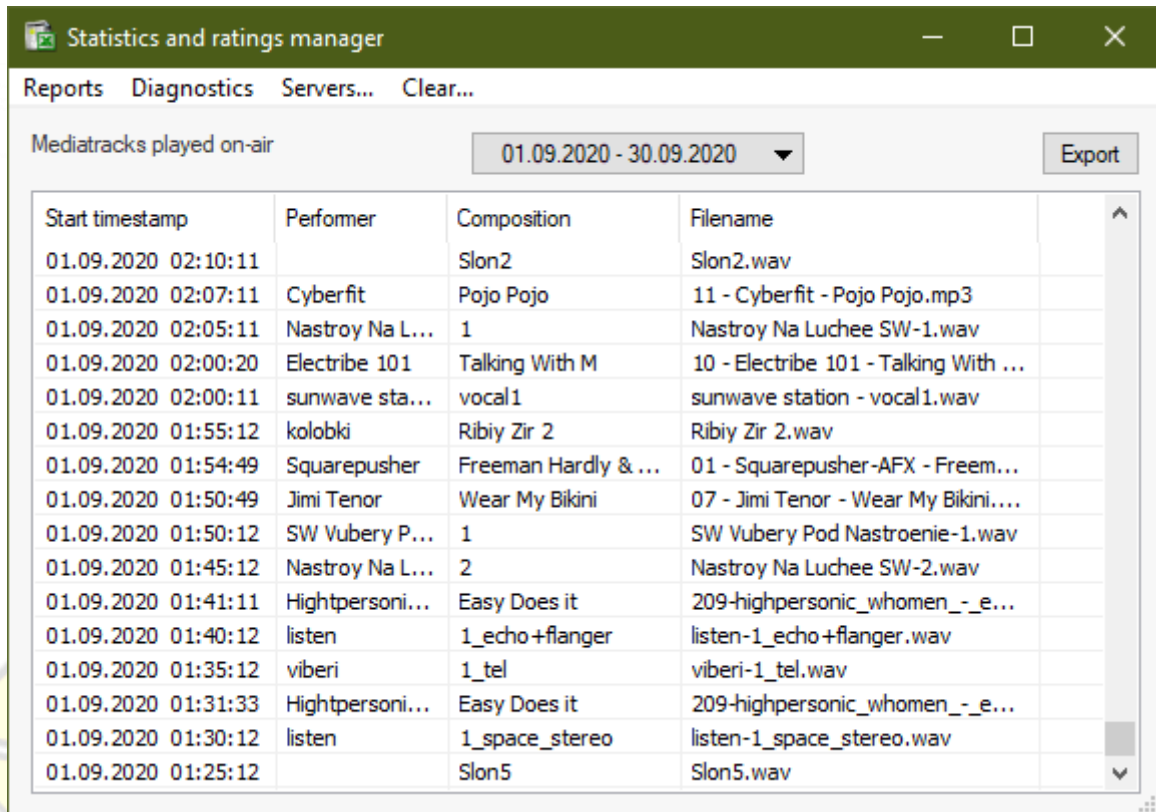
Additionally here you can set format of input (live-events) signal and its quality. (It's called preferred codec). 4 most important codecs is possible:

- **MPEG-1 Layer III** (as compatibility with most broadcasting software)
- **OPUS** (preferred if streaming over 3G/4G networks or bandwidth is issue)
- **FLAC** (preferred, if you network connections is smooth and stable)
- **RAW PCM** (only if you are broadcasting from a studio with minimum RTT to server)

STATISTICS AND ANALYTICS

General view and characteristics

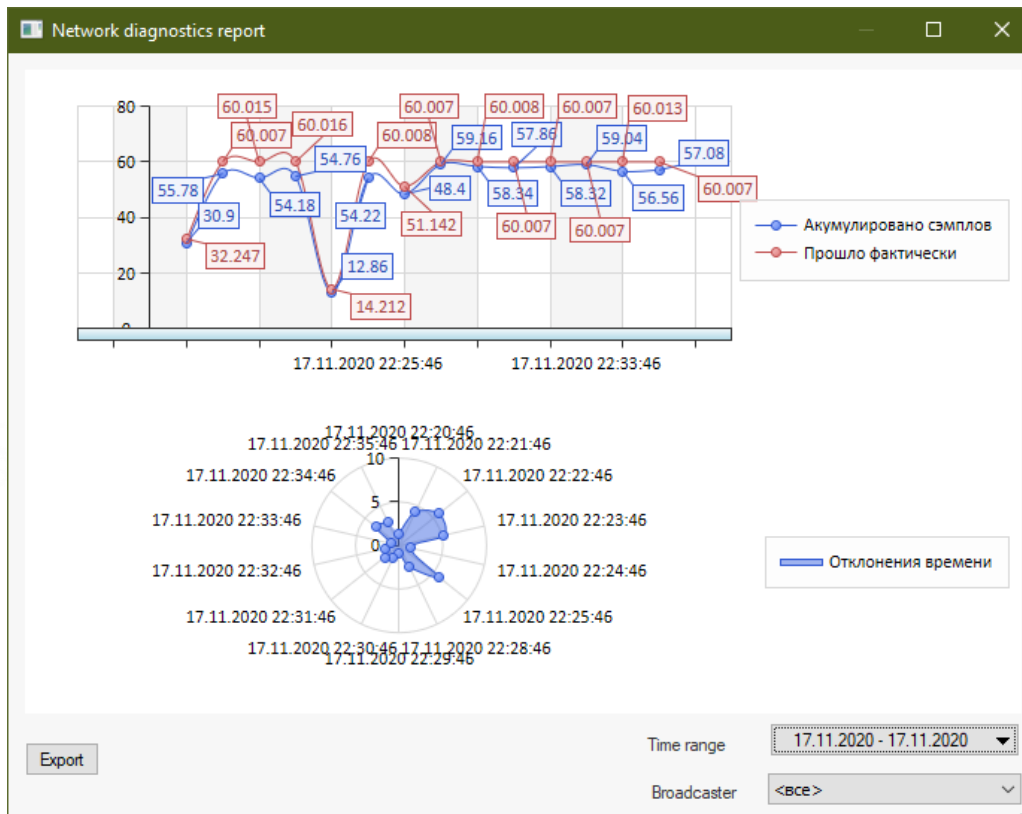
It allows, almost in real time, to evaluate and analyze the popularity, use of the resources of the radio station by listeners, as well as create reports based on historical data in the system. For example, using this tool you can see the list of songs that were broadcast on air, as well as generate monthly statistics on the used copyright works for submission to Collective Rights Management Societies.



The screenshot shows a software window titled "Statistics and ratings manager" with a menu bar containing "Reports", "Diagnostics", "Servers...", and "Clear...". Below the menu bar, there is a section labeled "Mediatracks played on-air" with a date range selector set to "01.09.2020 - 30.09.2020" and an "Export" button. The main area contains a table with the following columns: "Start timestamp", "Performer", "Composition", and "Filename".

Start timestamp	Performer	Composition	Filename
01.09.2020 02:10:11		Slon2	Slon2.wav
01.09.2020 02:07:11	Cyberfit	Pojo Pojo	11 - Cyberfit - Pojo Pojo.mp3
01.09.2020 02:05:11	Nastroy Na L...	1	Nastroy Na Luchee SW-1.wav
01.09.2020 02:00:20	Electribe 101	Talking With M	10 - Electribe 101 - Talking With ...
01.09.2020 02:00:11	sunwave sta...	vocal1	sunwave station - vocal1.wav
01.09.2020 01:55:12	kolobki	Ribiy Zir 2	Ribiy Zir 2.wav
01.09.2020 01:54:49	Squarepusher	Freeman Hardly & ...	01 - Squarepusher-AFX - Freem...
01.09.2020 01:50:49	Jimi Tenor	Wear My Bikini	07 - Jimi Tenor - Wear My Bikini....
01.09.2020 01:50:12	SW Vubery P...	1	SW Vubery Pod Nastroenie-1.wav
01.09.2020 01:45:12	Nastroy Na L...	2	Nastroy Na Luchee SW-2.wav
01.09.2020 01:41:11	Hightpersoni...	Easy Does it	209-highpersonic_whomen_-_e...
01.09.2020 01:40:12	listen	1_echo+flanger	listen-1_echo+flanger.wav
01.09.2020 01:35:12	viberi	1_tel	viberi-1_tel.wav
01.09.2020 01:31:33	Hightpersoni...	Easy Does it	209-highpersonic_whomen_-_e...
01.09.2020 01:30:12	listen	1_space_stereo	listen-1_space_stereo.wav
01.09.2020 01:25:12		Slon5	Slon5.wav

Besides from gathering musical audio statistics this system provides network telemetry when receiving livestreams. It's very effective instrument for troubleshooting problems with latency and networking gotchas.



The system contains a built-in tool for creating charts and graphs, as well as the ability to "export" raw data to process it in external programs (in CSV-format).

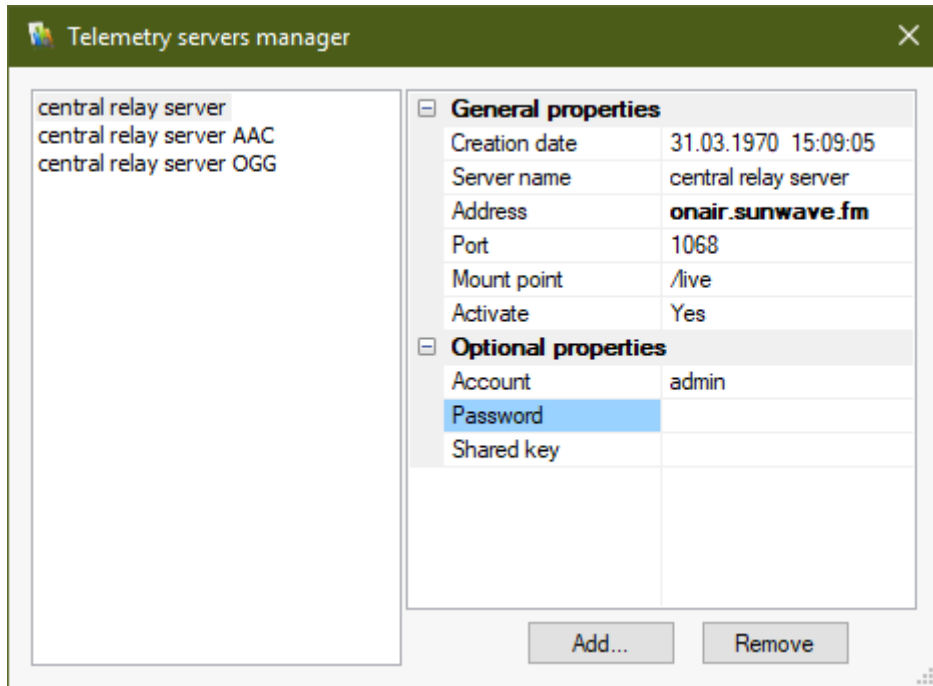
You can control the collection of statistics from the relay servers of broadcast streams. This allows a more detailed understanding of what is happening.

Statistics data, if necessary, can be deleted older than the selected date (select *Clear* from top menu).

Before statistics will be gathered you need to create statistics endpoint from the manager dialog.

Specify server address, port, mountpoint. Optionally you can (but not mandatory) configure this endpoint to be periodically pulled automatically by internal system for stats (add account name and password). If you leave empty fields here, system will not try to pull and instead of will wait for external agent to upload stats.

You can temporary shutoff statistics gathering from specific server or mountpoint by unticking 'Active' state.

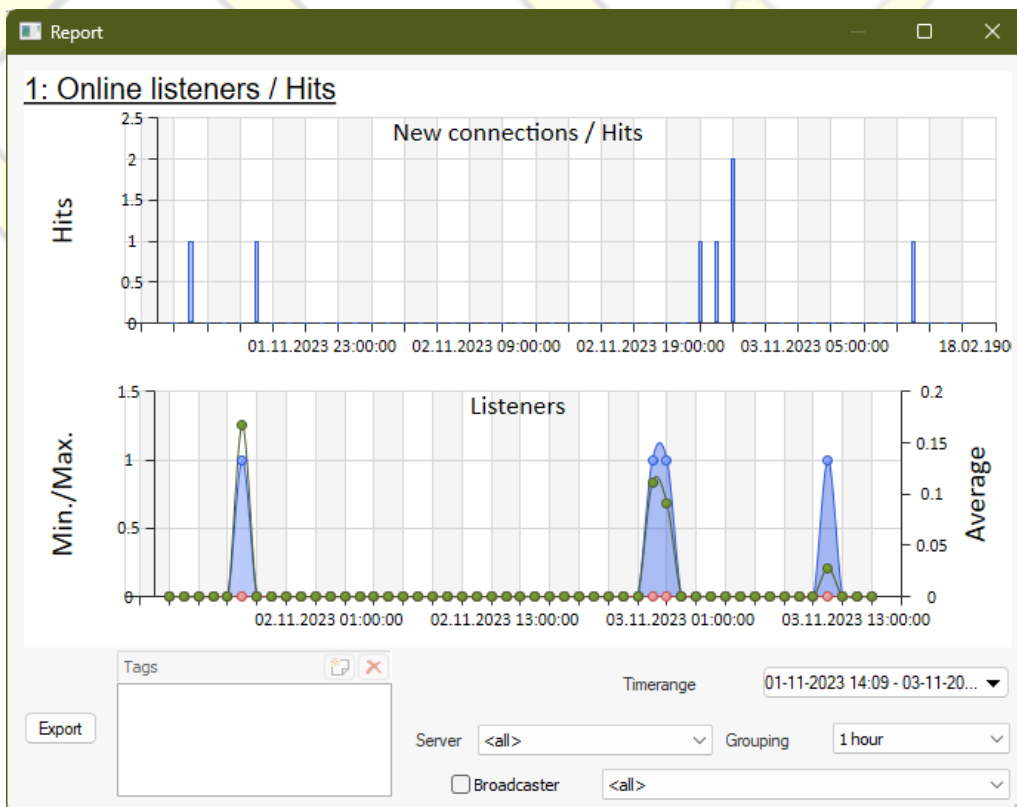


For this mechanism to work, there is a special agent installed on the server where you need to receive statistics remotely (via the HTTP protocol).

Currently this feature requires an *Icecast* server from Xiph.org or Kh-builds.

The system provides ~10 types of builtin reports showing information regarding various aspects of broadcasting. Let's consider each of the reports in more detail.

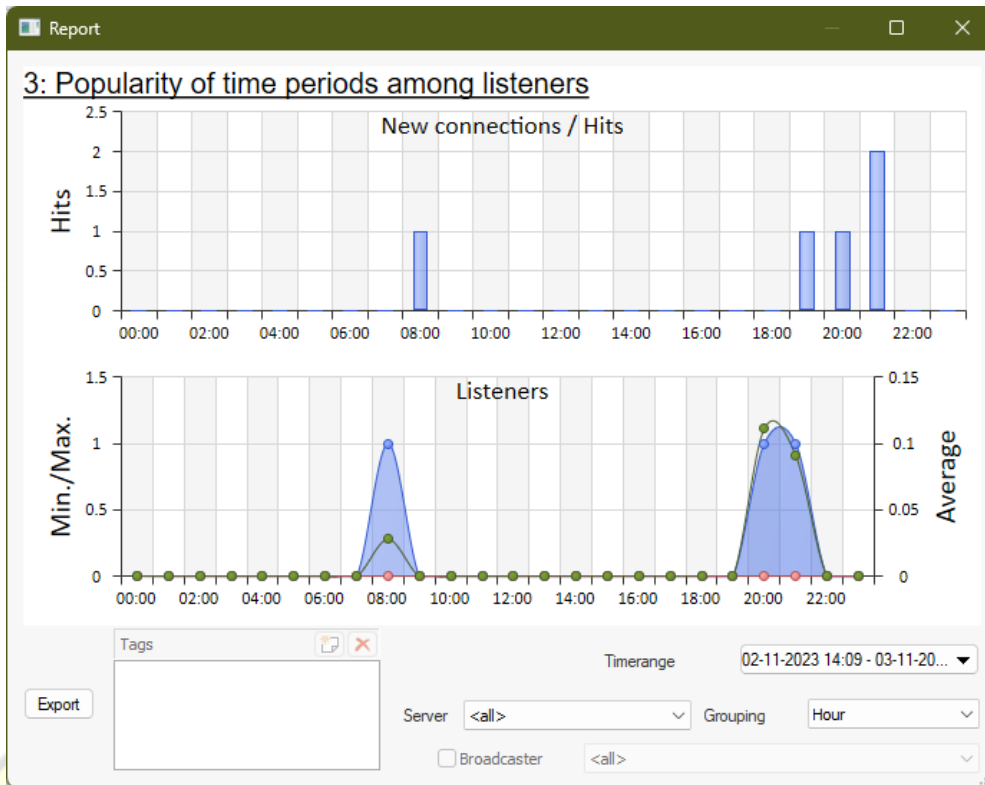
1.



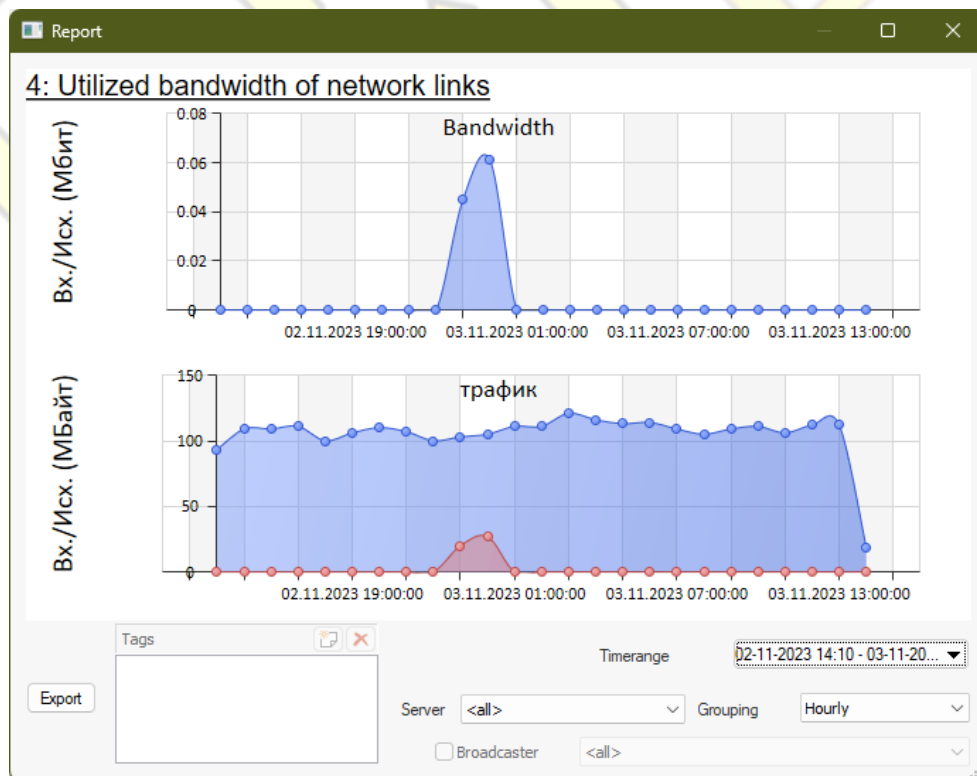
2.

---to be implemented---

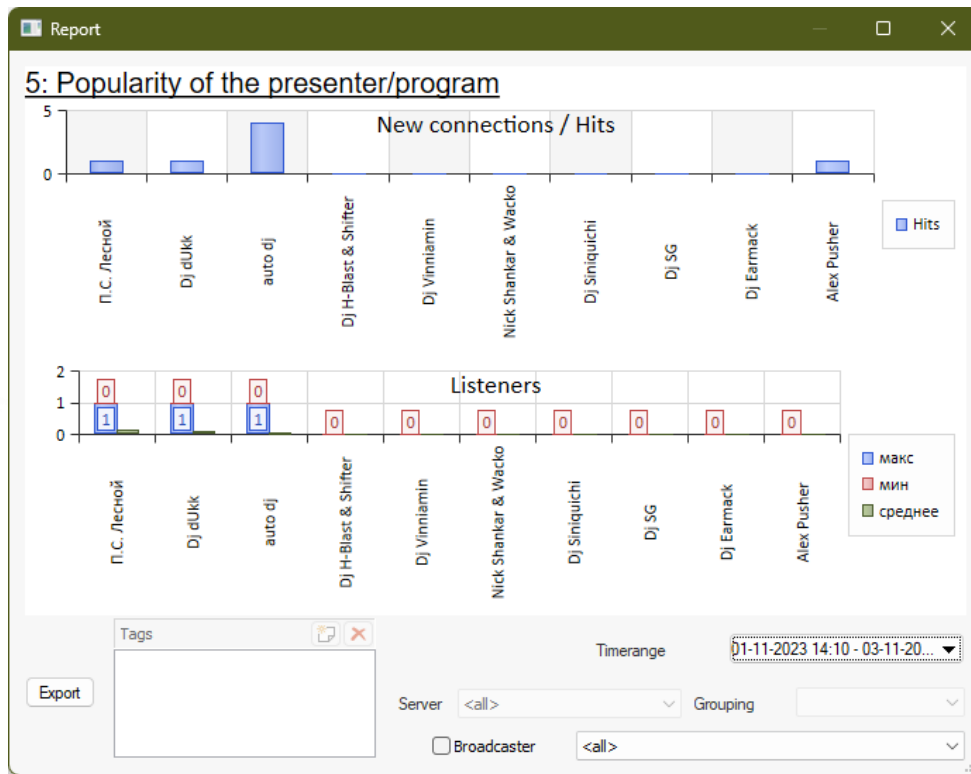
3.



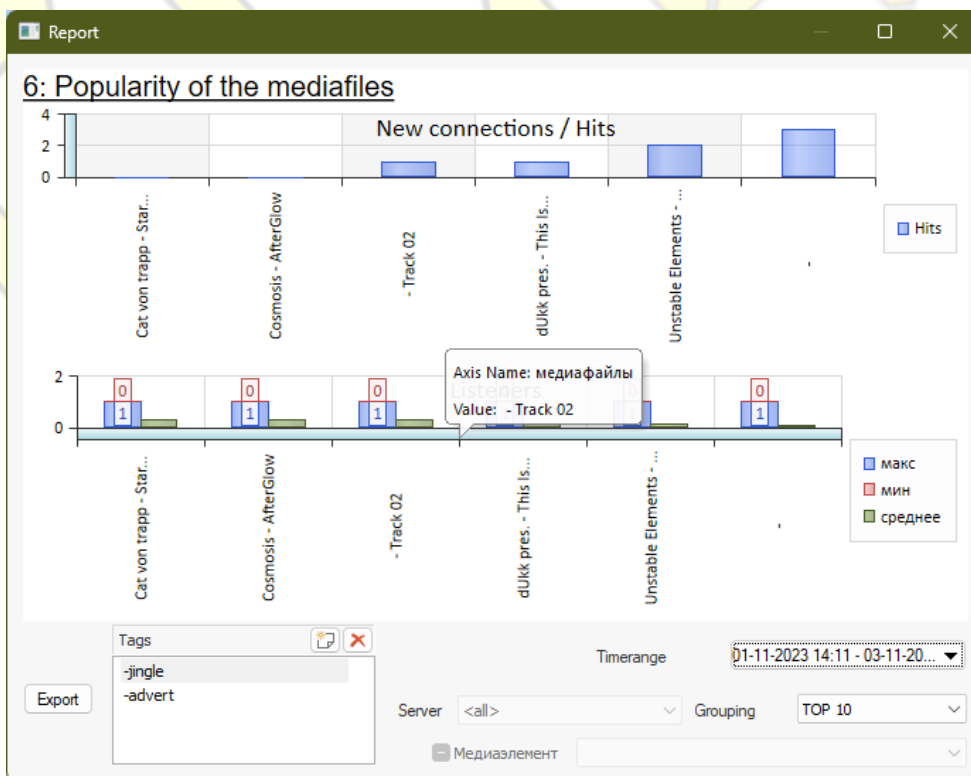
4.



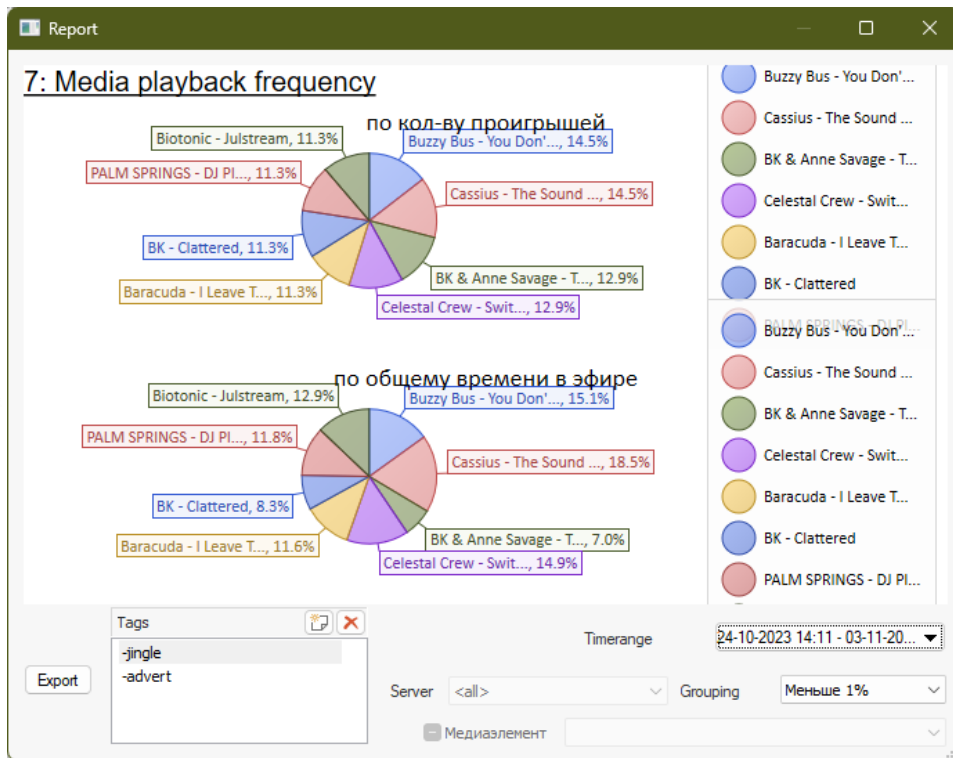
5.



6.



7.



8.

---to be implemented---

9.

---to be implemented---

10.

---to be implemented---

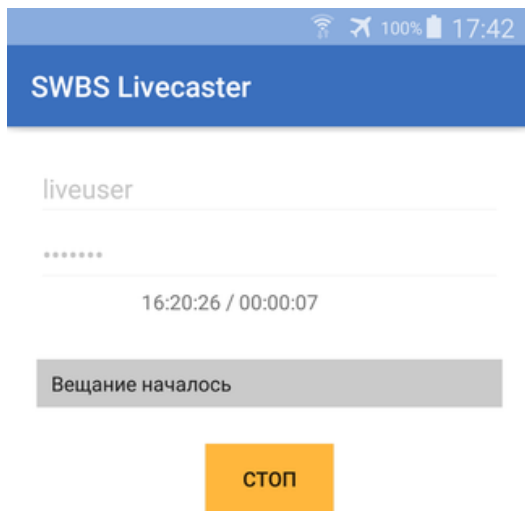
Livecast and real time streaming

A Livecaster is a special application that transmits an audio signal in real time to a central broadcast server for its further processing and broadcasting. The format of the transmitted signal can be either compressed by codecs, or a PCM raw signal without compression at all. The format is set from the console on the central server and cannot be changed by the user of the reference broadcaster.

Additionally reference client has unique ability to display helpful tips about current event timeline gathered from its playlist. For example tell deejay to not try to say something if current time is not best for this. This tips comes in simple 'allow' / 'denied' messages appears in progress bar under VU-meter.

Technical requirements

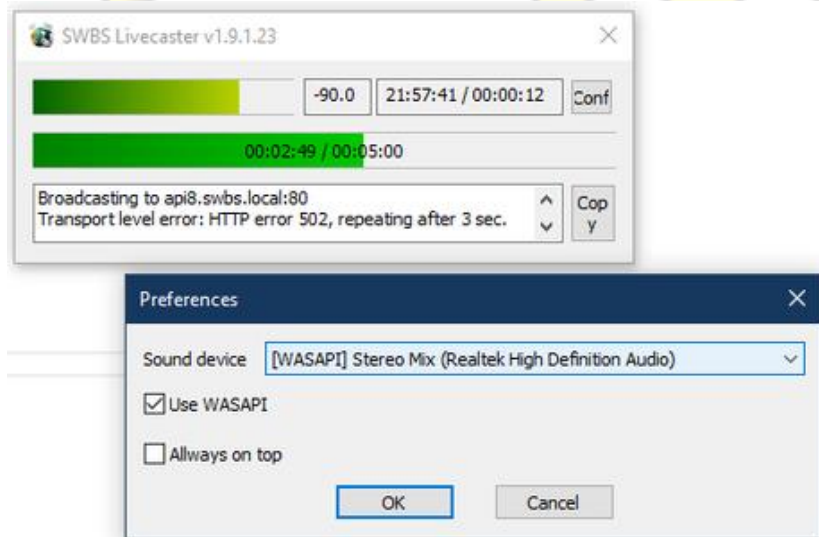
Android OS - version



- OS \geq 5.0 Lollipop (API level 21)
- Sound device (microphone), sampling rate 48khz, 16bit.

The only thing that is configured by user is the login with the account password. Due to the specifics of this OS, you must manually press the START button to start broadcasting. Upon reaching the maximum possible duration of broadcasting - broadcasting will stopped automatically.

Windows OS - version



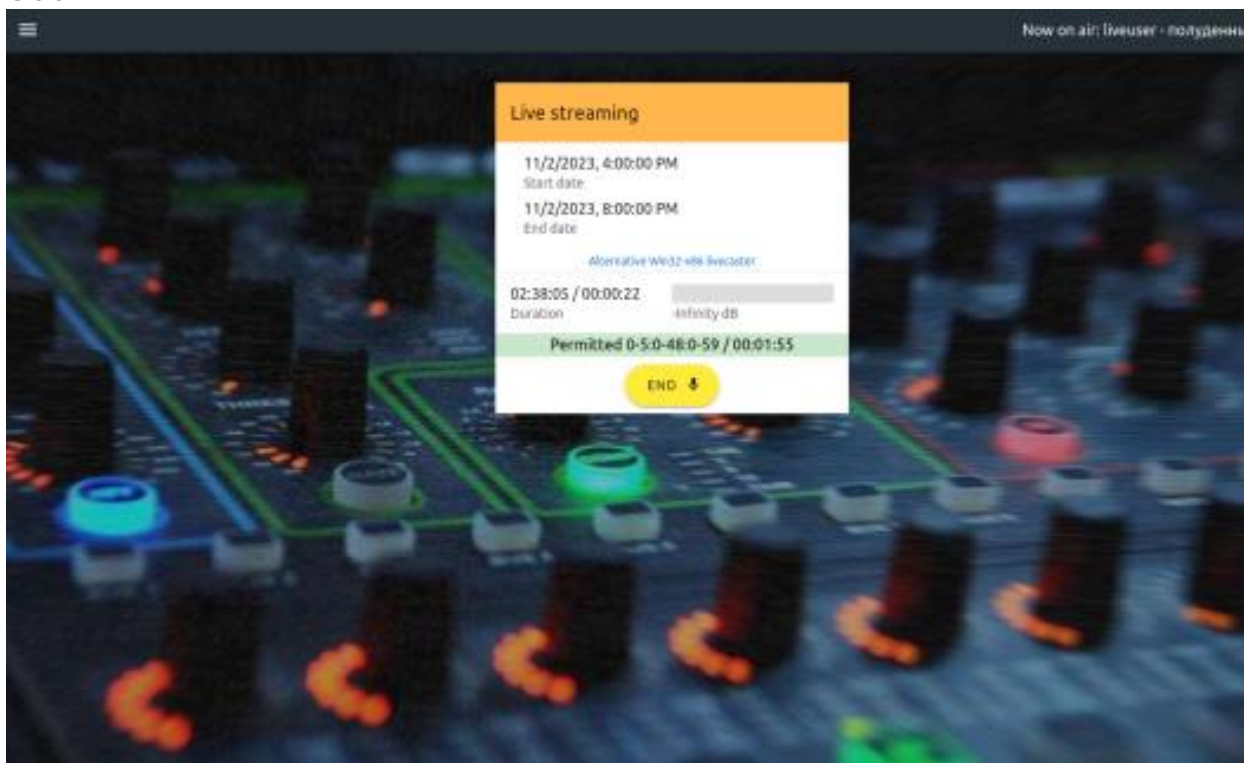
- Microsoft Visual C 2017 Redistributable (x86). If your computer is connected to the Internet, downloading and installing will be done automatically. Otherwise, you must go to www.microsoft.com in advance and download this software component yourself.

- Two button mouse
- Keyboard

- Sound card compatible with WASAPI or DirectSound 9
- OS Windows 7 or higher

The only thing you need to do is select a sound device used as a source. This device uses the assigned properties in the OS default record input. After entering the login, password, the program works completely automatically - receives a time window for the next possible broadcast and waits it. When a window approaches, it automatically starts broadcasting a signal; at the end of a window, it automatically ends.

Web-version



Requires a modern *HTML5* browser (Chrome-based, Firefox, Safari) for its work with support for *WebSocket*, *WebWorkers*, *WebAudio* technologies. At startup, access to the input device (microphone) for the site where the broadcaster is located will be automatically requested. Due to recent strict security of web, you only need to press **START** button. All other things will go automatically.

Works on all devices where these web technologies are supported and enabled.

When an unstable network transmission conditions exists, the server automatically adds buffering (signal delay) from such a source to provide a stable signal delivery for high-quality broadcasting.

In addition to specially designed broadcaster programs, the system supports emulation of the free **Icecast 2** broadcast server (Xiph.org) for signal reception. This means that the signal source can be taken from any program that supports **libShout + Icecast2**. For example **Mixxx**, **Traktor Dj**, **Virtual Dj**, **OBS Studio** or any other compatible ones.

There is interesting feature: live-performance scenario. When live-client connects it will be presented with simplified current scheduled playlist in form of simple (can speak / don't speak) markers. This allows deejay to keep its voice silent when there are server-programmed jingles or advertisements broadcasted periodically. So listeners won't see deejay voice begin unexpectedly cut off. This feature is on the ribbon on screenshots above.