

New Horizons 3000 Broadcast Software Documentation

Draft Feb 2026 by Ed lang

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Purpose

Provide non technical workflow documentation for end user. Technical documentation can be found at <https://github.com/nh3000-org/broadcast/tree/main>.

The wiki (<https://github.com/nh3000-org/broadcast/wiki>) with the source code is designed for system builders and programmers.

The workflow is divided into functional sections defined by user roles.

Roles

Administrator – Full access to system

DJ – Disk Jockey access to specialty categories.

NWS – News Weather Sports access.

Music Director – Web access to manage music/shows playlist's.

Accounting – Access to historical advertising data and current advertising campaigns.

Security

Security is achieved by limiting access to the system using commonly accepted measures.

Definitions

VPN – Provided by router. User VPN credentials are managed here.

WEB – HTTPS connections through port 3000, managed by Cloudflare tunneling technology

Use VPN to access entire system GUI, Terminal and DJ systems

Use WEB for remote content management and reporting.

Systems

GUI – Accessed through VPN as a remote desktop, GOD mode.

WEB – WWW access using keys, user, and password combinations.

SSH – Terminal access though VPN to provide real time status of system.

Overview

The system is divided into functional categories which provide secure access to the system from:

WWW – HTTPS access for daily content providers and billing administrators.

VPN – Gives remote desktop and SSH access.

The functions and use cases balance security with ease of use.

Cloudflare is used to expose port 3000 to the world without punching a hole in the firewall. It provides 2-factor authentication and proxy services for HTTPS access.

For increased functionality, a VPN is used to tunnel to the server and other network available resources.

The VPN encrypts the traffic and traffic is encrypted within the VPN tunnel.

Installation and Configuration

The system uses NATS for storage, POSTGRESQL for database and GO as the programming language. Hardware requirements include enough space for 3 times the actual space used for music libraries and a high end sound card. The detailed documentation can be found at :
<https://github.com/nh3000-org/broadcast/wiki>

Access

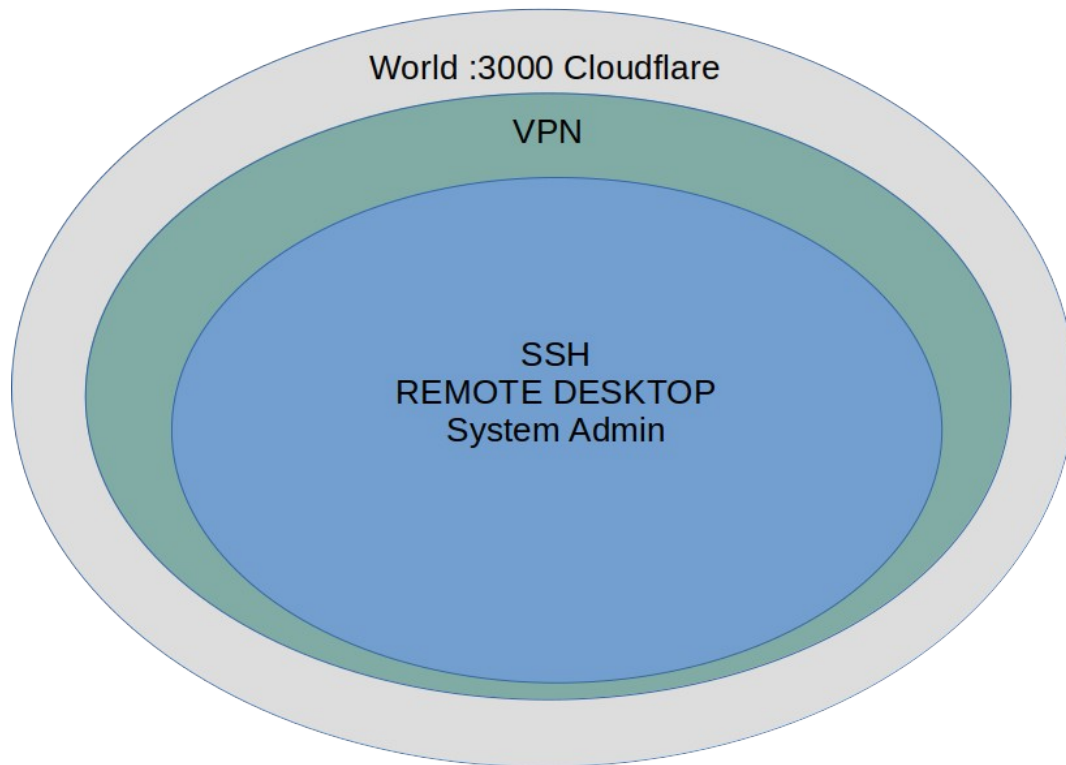


Figure 1 Layered Security

Figure 1: Layered Security

VPN

A Virtual Private Network extends a private network to the public. It provides Host-to-Network functions allowing users with login credentials to access a private network located behind a Cable Modem or Wireless Modem. This function is provided a a router that is used to establish connectivity between the local network and edge devices. Users are managed on the router. Services like remote-desktop and SSH are usually done through the VPN. This provides a secure transport layer into the private network. See Figure 1.

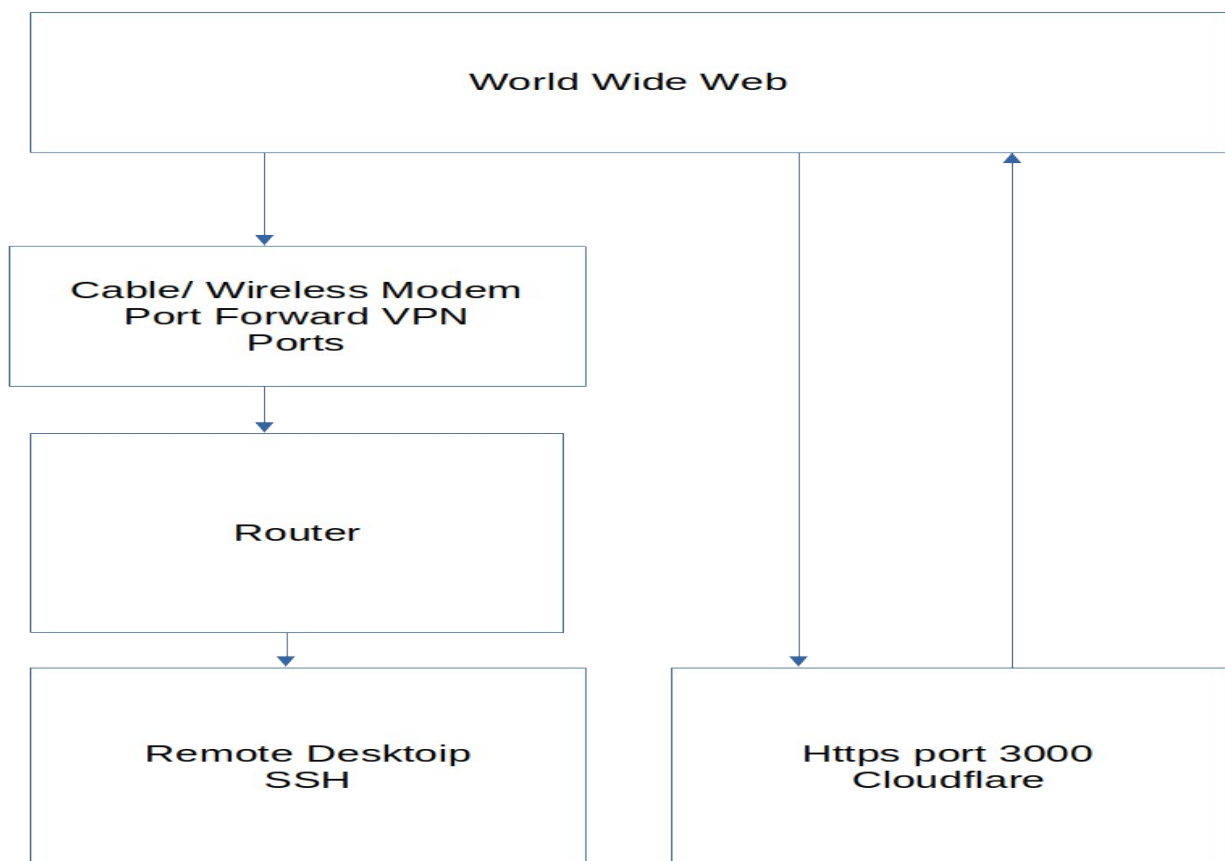
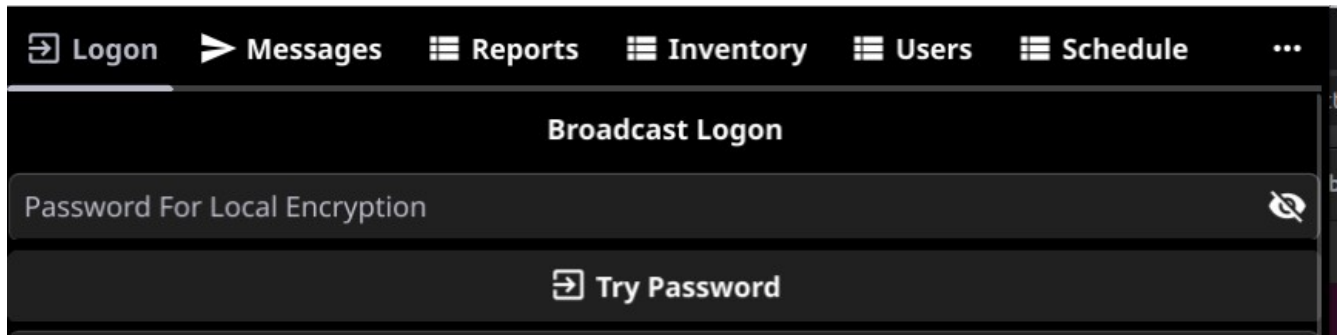


Figure 2: Network Overview

GUI

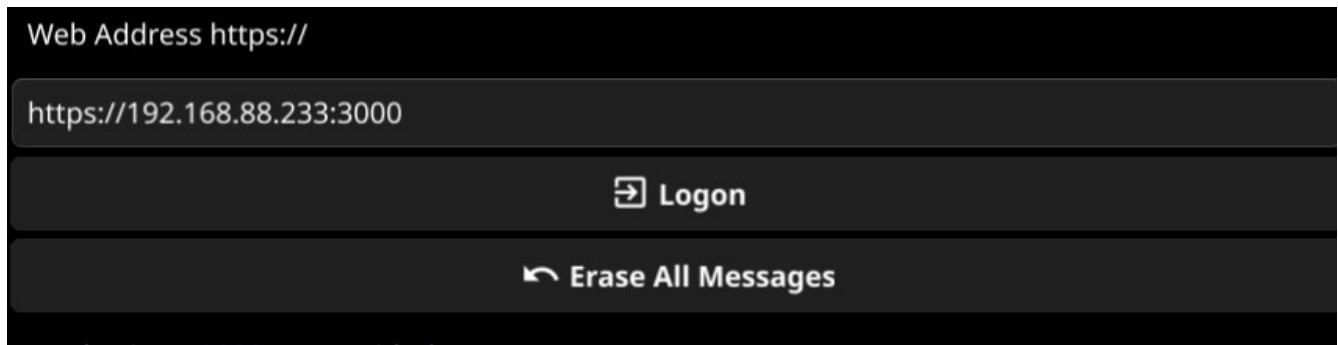
Accessed through the remote-desktop software (no-machine). Provides the Graphical User Interface, DJ Console, and real-time statistics for the system.

On the remote desktop select GUI.



Enter the system password and tap “Try Password”

This will bring up encryption details. User interfaces and other high level data. There is no need to change this, it is presented as information only. If you do change this, the system may fail.

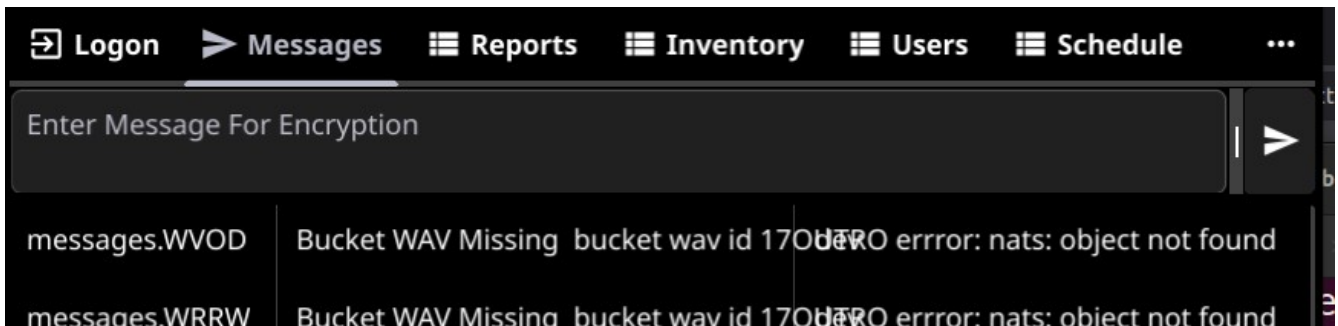


Tap Logon to continue.

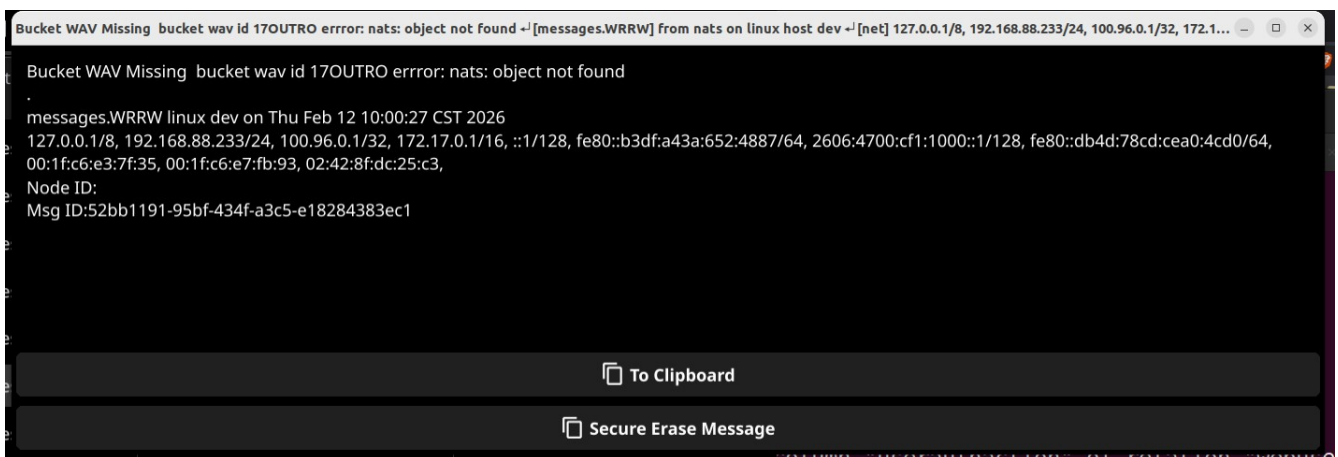


These are the functions available after successful login.

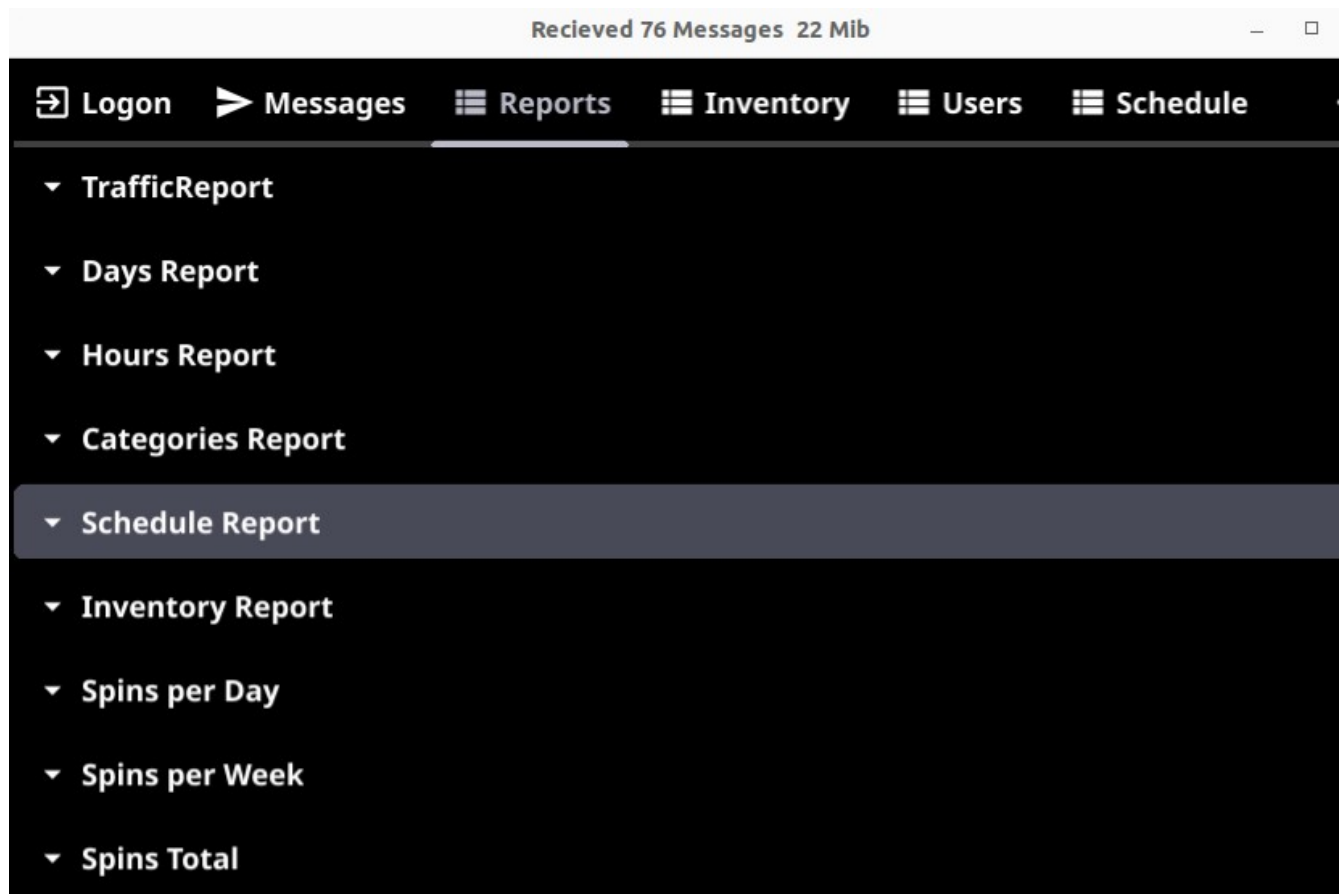
Messages



Messages generated from system errors are generated here. Tap on message to see full details.



Reports



Select6 report, fill in additional filters as required.

Inventory

The content is displayed here sorted by category.

Recieved 76 Messages 22 Mib

	Logon	Messages	Reports	Inventory	Users	Schedule
	Add	Import Stub	Export Stub	Sync Db to FS		
1	ADS	ad1artist	ad1song	ad1campaign		
2	ADS	ad2artist	ad2song	ad2campaign		
3	ADS	ad3artist	ad3song	ad3campaign		
4	ADS	ad430	ad430song	ad430campaign		
5	ADS	ad530	ad530song	ad530campaign		
6	ADS	ad630	ad630song	ad630campaign		
7	ADS	ad730	ad730song	ad730campaign		
8	ADS	ad8artist	ad8song	ad8campaign		

Tap on an item to edit its contents.

Manage Inventory Items

1

Category:

ADS

Artist:

ad1artist

Song:

ad1song

Album:

ad1campaign

Load Song

Load Song

Song Size: 10584044

Intro Size: 0

Length:

60

Manage Inventory Items

Song Size: 10584044

Intro Size: 0

Length:

60

Play Order:

035857

Starts On:

2026-01-23 08:41:19

Expires On:

2026-02-22 07:41:19

ADS Time Slot:

☐ 00

☐ 01

☐ 02

☐ 03

☐ 04

☐ 05

☒ 06

☒ 07

☒ 08

☒ 09

☒ 10

☒ 11

ADS Day Slot:

Manage Inventory Items

☐ 00

☐ 01

☐ 02

☐ 03

☐ 04

☐ 05

☒ 06

☒ 07

☒ 08

☒ 09

☒ 10

☒ 11

ADS Day Slot:

☒ MON

☒ TUE

☒ WED

☒ THU

☒ FRI

☐ SAT

☐ SUN

ADS Max Spins Per Day:

12

ADS Max Spins Per Hour:

1

Last Played:

2026-02-16 11:39:26

Date Added:

2026-01-23 08:41:19

Source Links:

Manage Inventory Items

Date Added:

2026-01-23 08:41:19

Source Links:

Stub

Spins Today:

9

Spins Weekly:

9

Spins Total:

446

Save Inventory

Delete Inventory

Field Definitions

Table 1: Inventory Fields

Name	Usage
Category	Selectt the category that this item fits. Categories may be added on the Categories tab and put on the schedule on the Schedule tab.
Artist	Name of the artist, segment customer..etc
Song	Identity of audio clip
Album	Name of the album or source this clip is from. ADVERTISING uses this field to match into Quick Books inventory. Reporting is available to detail spin date and time for verifying rotation
Button: Load Song	Save Item First then add content to the store
Button: Load Song Intro	Save Item First then add content to the store

Button: Load Song Outro
Length
Play Order

Starts On

Expires on

Ads Time Slot

Ads Day Slot

Ads Max Spins Per Day

Ads Max Spins Per Hour

Last Played

Date Added

Source Links

Spins Today

Spins Weekly

Spins Total

Button: Save Inventory Item

Button Delete Inventory Item

Save Item First then add content to the store
Calculated on first play
Generated every start of day to randomize
inventory play order

Day the inventory starts on, usually take default but
for Advertising a start date might be required.

Day the inventory ends on, usually take default but
for Advertising a end date might be required.

Promos may also require to end the content on a
particular day

Select all the hour parts this add is allowed to play,
This provides a means to run daytime, nighttime,
late night ads

Select all the days the ad is allowed to play,
combined with Ad Time Slot makes for an
extensive ad format allowing for different types of
ads

Select a integer number specifying the number of
times an ad is allowed to repeat on a given day

Select a integer number specifying the number of
times an ad is allowed to repeat in a given hour

Date of last play

Add date

Where this item came from

Save the inventory item before uploading the
content

Deletes inventory from data base and content store

Users

Recieved 77 Messages 24 Mib

Logon Messages Reports Inventory Users Schedule

Add User

1	admin	admin777	019bf721-c429-73c6-b942-7df8a004d8b7
---	-------	----------	--------------------------------------

This tab provides security and authentication for HTTPS users. These users have a limited function and the necessary tools are exposed through an HTTPS connection to port 3000 proxied through Cloudflare.

Button: Add User – create a user profile.

Click on a profile to edit.

Manage User

Delete User

Row:

2

Role

admin

User Password

admin777

User Password Hash

019bf721-c429-73c6-b942-7df8a004d8b7

User Authorized Categories

☒ ALL

☐ DJAM

☒ DJPM

☐ NWS

☐ CURRENTS

☐

User Authorized Actions

Manage User

2

Role

admin

User Password

admin777

User Password Hash

019bf721-c429-73c6-b942-7df8a004d8b7

User Authorized Categories

☒ ALL

☐ DJAM

☒ DJPM

☐ NWS

☐ CURRENTS

☐

User Authorized Actions

☒ ALL

☒ Upload/Download

☐

☐ Chart

☐

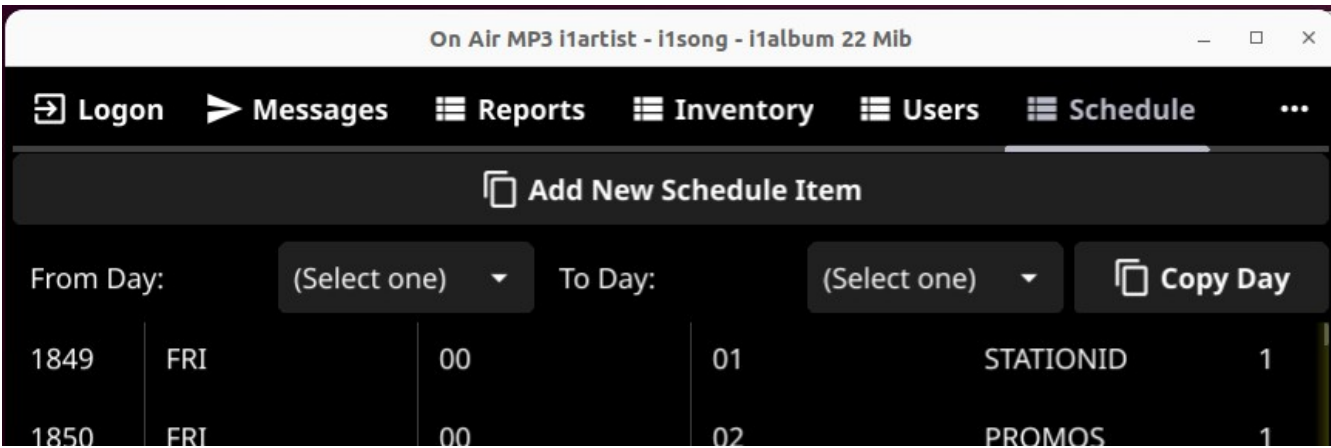
Save User

Field Definitions

Table 2: User Fields

Name	Usage
Button: Delete User	Eliminate this user from the HTTPS Web Interface
Role	Name of functional category of this user, News-Weather-Sports might be NWSDon or Disk-Jockey may be DJAM, DJPM, required at each logon
Password	This users password which will be required at every logon
Password Hash	System generated part of the security system.
Authorized Categories	Select all the categories this user should be allowed to access on the Upload content button of the Web Interface
Authorized Actions	Select the actions this user is authorized to perform
Button: Save User	

Schedule



This is the heart and soul of the system. It is where the content is defined for play.

It is extremely important to get this correct while changes can be made, it is much much easier to get the schedule close from inception.

Button: Add new Schedule Item

Tap an item to edit.

Manage Schedule

Delete Schedule Item

Row:

1850

Day:

☐ MON

☐ TUE

☐ WED

☐ THU

☒ FRI

☐ SAT

☐ SUN

☐ VID

Hour:

00

Position on Schedule:

02

Category to Pick From:

PROMOS

Spins to Play From Category:

Manage Schedule

Save Schedule

1850

Day:

☐ MON

☐ TUE

☐ WED

☐ THU

☒ FRI

☐ SAT

☐ SUN

☐ VID

Hour:

00

Position on Schedule:

02

Category to Pick From:

PROMOS

Spins to Play From Category:

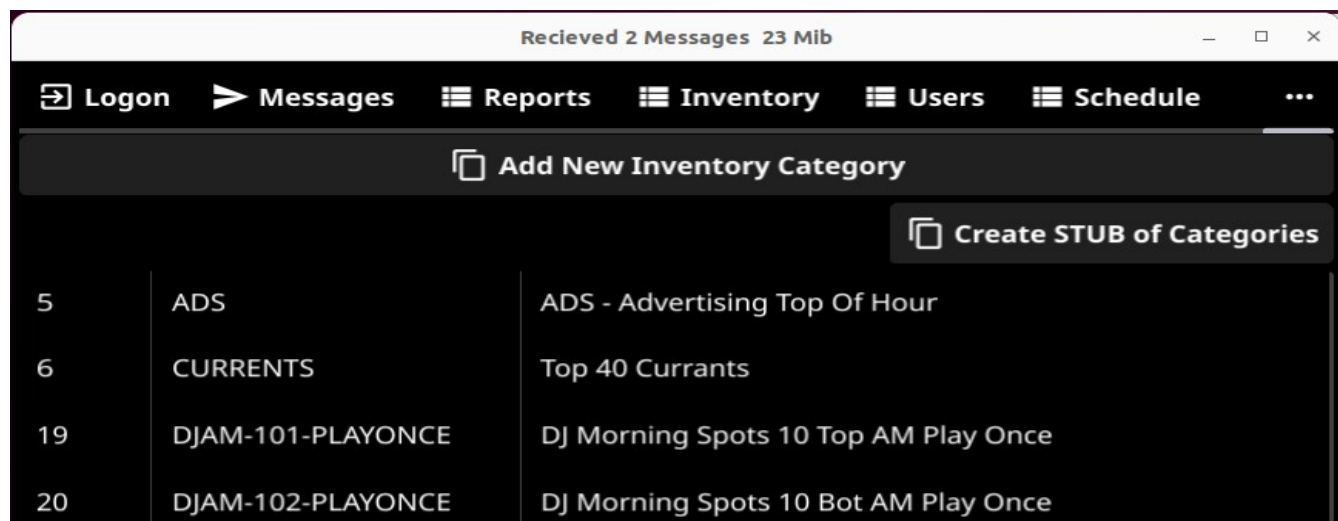
1

Field Definitions

Table 3: Schedule Fields

Name	Usage
Button: Delete Schedule Item	
Day	Day of Week for this schedule item
Hour	Hour part using military time 00 – 23 hour format where 00 is Midnight and 23 is 11:00 PM
Position On Schedule	Is fine tuning for sequencing schedule item within the hour
Category To Pick From	Inventory category for automated selection, STATIONID (Legal Station ID) should always be first and FILTOTOH (Fill To Top of Hour) should always be last.
Spins to Play From Category	Number of inventory items to play from this category.
Button: Save Schedule	

Category



Button: Add New Inventory Category

Button: Create STUB of Categories

The STUB is a generated file system which provides all of the defined categories in an easy to use template for uploading content to the server. The content is placed in the STUB and the directory is ZIP'ed and uploaded to the server through HTTPS Web Interface.

Field Definitions

Table 4: Category Fields

Name	Usage
Category	Name of the category, use PLAYONCE as part of the category to indicate to the schedule player that the content is to be deleted after playing
Description	Alias of the category
Button: Save Inventory Category	

Hours

All hours are entered, 00-23 using military time codes

Days

All hours are entered, MON,TUE,WED,THU,FRI,SAT and SUN.

Enc/Dec

Refer to technical documentation. Enc/Dec 24 Character Password sets the encryption key for the system. Change this with caution as you system may become bricked. You can encrypt/decrypt items on this tab

Settings

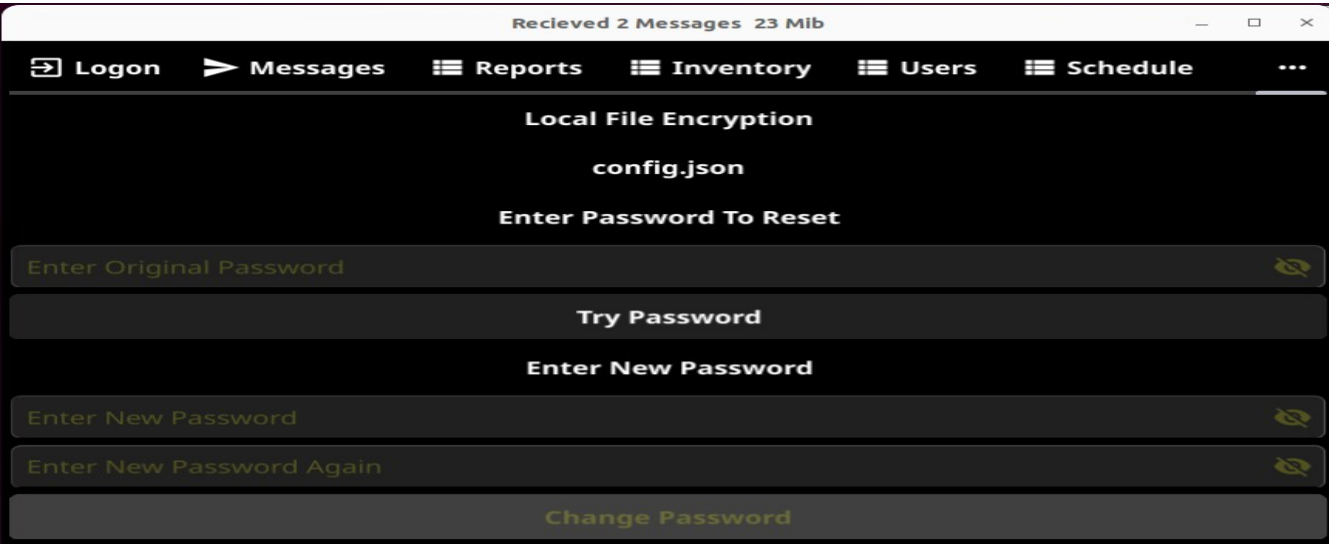
On the settings tab, various system wide parameters are defined

Table 5: Category Definitions

Name	Usage
Preferred Language	Eng. Spa or Hin
Content Format	Mp3. Mp4, wav once set cannot be changed
Message Max Age in Hours	Number of hour a message will appear on message tab
Advertising Max Minutes	Per segment limit
Omit Connected/Disconnected	Turn of user logging
Button: Change Settings	
Button: Dark	
Button: Light	

Password Reset

Changes the encrypted config.json file to match the compiled password. This is also the System ID on the Web Interface. Change the password here then recompile the interfaces using the new password.



Field Definitions

Table 6: Reset Definitions

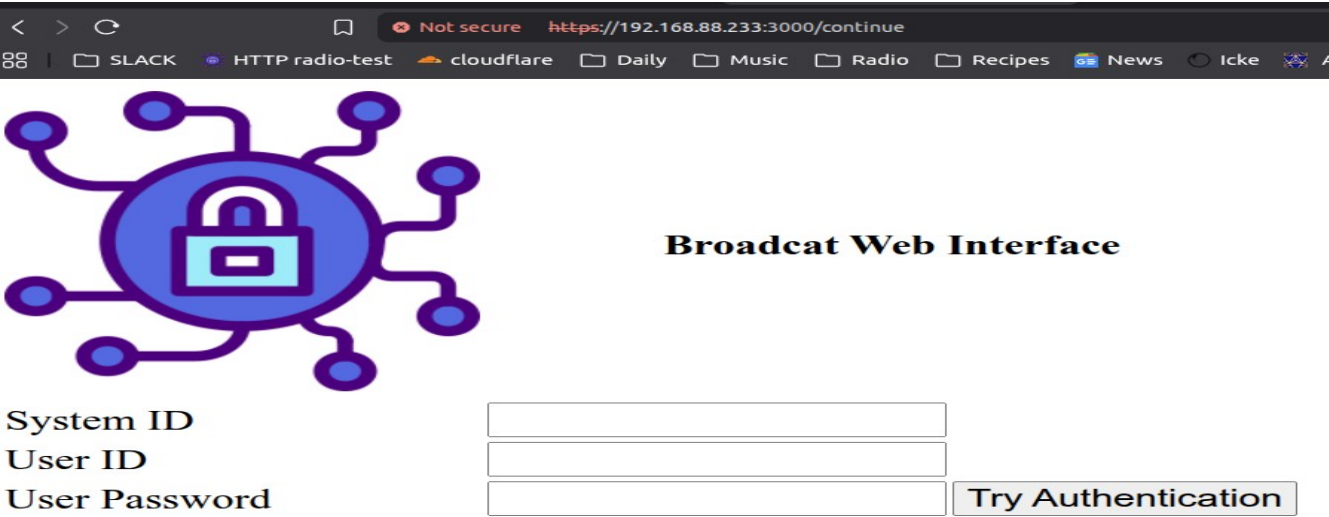
Name	Usage
Enter Password to Reset	Original password
Button Try Password	Try original password
Enter New Password	New password
Enter New Password Again	New password again
Button: Change Password	

HTTPS Web Interface



Button: Continue

Tap Continue to view the logon screen.



Login Field Definitions

Table 7: Login Fields

Name	Usage
System ID	Id to unlock encrypted configuration file
User ID	User role from GUI user definitions
User Password	Password from GUI user definitions
Button: Try Authentication	

After Authentication

The screenshot shows a web browser window with the address bar displaying "https://192.168.88.233:3000/login". The page title is "Broadcast Web Interface". The interface includes a header with a logo and the title. Below the header, there are several sections of controls:

- File Upload Section:** Includes a "Choose File" button (labeled "No file chosen"), an "Upload stub.zip" button, and a "Download stub.zip" button. A text box explains: "Upload and process a stub file. The file must be in zip format. Manually upload content with restrictions. Download a stub file. The file is in zip format. Use this to build content".
- Category Selection Section:** Features three dropdown menus for "7 Days", "Advertising", and "ad1campaign", along with buttons for "Category History", "Ad Report", and "Ad History". A text box explains: "Produce a line chart using parameters".
- Inventory Section:** Includes buttons for "Inventory counts" and "Schedule counts". A text box explains: "Produce a line chart using parameters".
- Clear Traffic Section:** Includes a "Clear Traffic Over 1 Year Old" button. A text box explains: "Produce a pie chart using parameters".

Displayed options are dependent on User setup from GUI. This interface is exposed to the world on port 3000. Production systems may use a DNS name rather than an IP address.

Field Definitions

Table 8: Web Interface

Name	Usage
Button: Choose File	Opens a file browser to you STUB.zip file in zip format from the root directory of the STUB, Ex: C:\mystuff\stub.zip is where you put your content and zipped it for upload
Button: Upload stub.zip	Upload and process the STUB on the server
Button: Download stub.zip	Downloads the STUB based on current categories, if categories are added download a new STUB
Section: Category History	Produces a line chart from existing data
Selection: Number of Days	Select the number of days the chart should use
Selection: Category	Select the category to chart
Button: Category History	
Section: Ad Report	Produce a billing report based on Album name that corresponds to Quick Books
Selection: Number of days	Select how many days of history to report
Selection: Campaign	Select the Ad campaign to report on
Button: Ad Report	
Section: Ad History	Produces a line chart of activity
Selection: Number of days	Select how many days to chart
Selection: Campaign	Select campaign to chart
Button: Ad History	
Section: Inventory Counts	Produce a pie chart showing distribution
Button: Inventory Counts	

Section: Schedule Counts

Button: Schedule Counts

Section: Clear Traffic Over 1 Year Old

Button: Clear Traffic Over 1 Year Old

Produce a pie chart of the schedule

Clears traffic counts

SSH

SSH access is provided through the VPN. It is used to display real-time status of the system in a terminal session. Use your operating systems terminal to login to the server.

ssh <your user name>@<your server ip address>

Where: <your user name> is the server user

<your server ip address> is the actual IPv4 address for your server

Upon successful authentication enter nhterminal to start the session

Type	Value	U...	On Air	Artist	Song	Album	Length	Left	28
MEM Total	7941	mb	Playing	r76400artist	r7song	r7album	240	0	
MEM Free	644	mb							
MEM Used	72.45	%	Category	Day	Hour	Position	Spins	Left	
CPU Used	52.51	%	FILTOTOH	TUE	10	99	0	4	
PGM Used	2206	k	Category	Day	Hour	Position	Spins		
/	935393	gb					0		
Used	332622	gb					0		
Free	555183	gb					0		
/home	112102	gb							
Used	88366	gb							
Free	17996	gb							
/opt	935393	gb							
Used	332622	gb							
Free	555183	gb							
								Bucket WAV Missing	
								bucket wav id	
								170UTRO error:	
								nats: object not	
								found	
								Bucket WAV Missing	
								bucket wav id	
								170UTRO error:	
								nats: object not	
								found	
								Bucket WAV Missing	
								bucket wav id	
								170UTRO error:	
								nats: object not	
								found	
								Bucket WAV Missing	

Use CTRL-C to cancel the session

Type exit to close the terminal

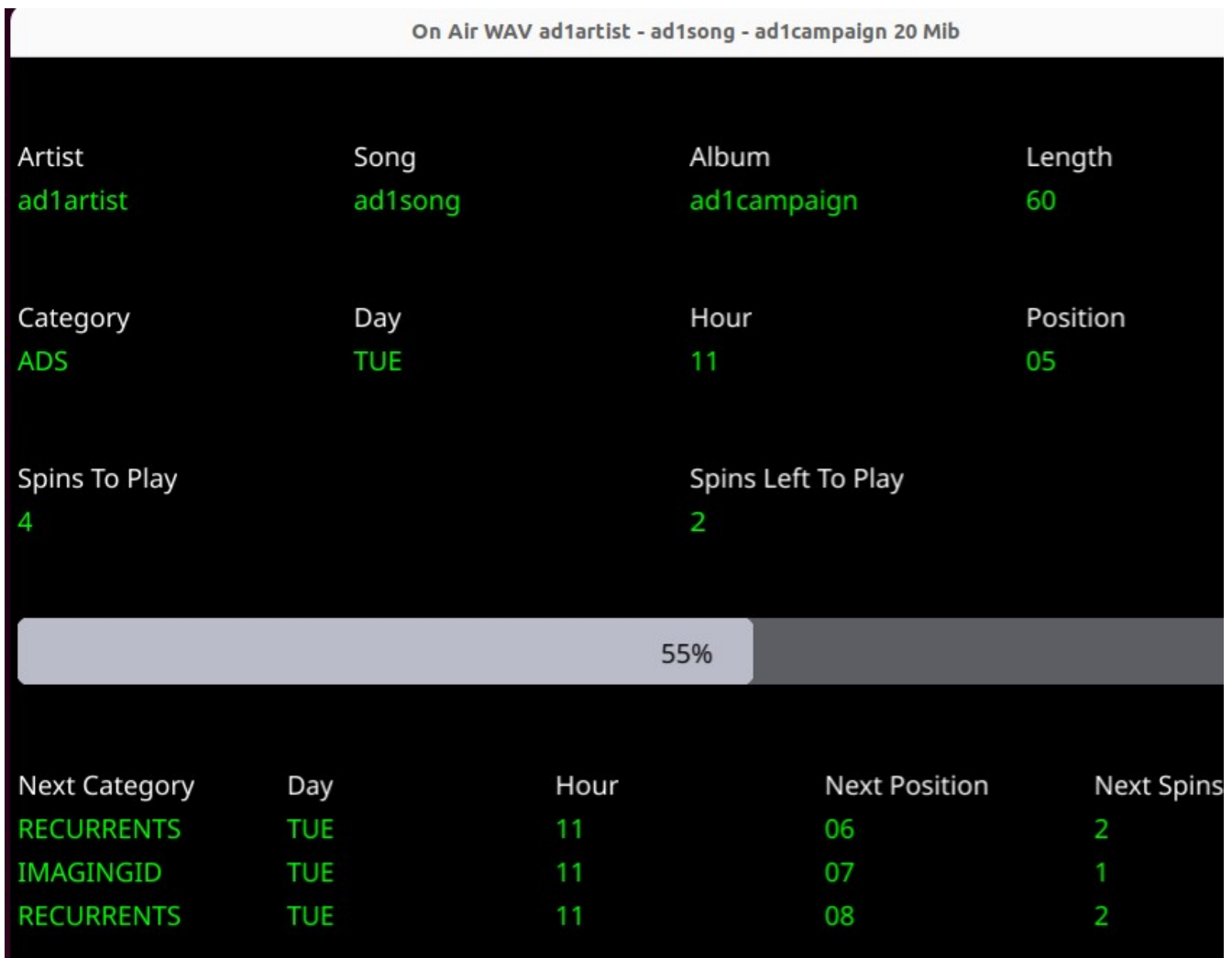
DJ Console

The DJ Console is a convenient way to track currently playing on the system.



Login Field Definitions

Name	Usage
Password For Local Encryption	Enter the System ID
Button: Try Password	



The system displays the current on air and the upcoming schedule items on the schedule.

System Operation

Adding daily content such as DJ and NWS spots. These spots are prerecorded and uploaded using the stub. The spots are deleted one played to keep system current. Upload the spots prior to their schedule placement.

A special category called NEXT can be used to insert items for next play in the player.

If a DJ or NWS spot is empty then it is skipped.

For in-studio, a blank segment can be uploaded and the DJ can switch sources while viewing the DJ console and listening to the broadcast for queuing purposes.

The player selects the music on the list in real time. It does not know what is going to play until it is requested on the schedule.

The schedule behavior is different from live systems. There is not need to announce music from a DJ point of view (you wont know what is next). The system handle music announcements by providing INTRO/OUTRO processing for CURRENTS and will randomly pick the INTRO/OUTRO in real time. So the DJ can say something like “and now back to more new music” since CURRENTS or RECURRENTS are always after a DJ or NWS spot.

Once the music format is selected MP3 or WAV in the GUI settings it cannot be changed. No mixed content is allowed.

There are 4 services which are set to auto start on the server/client, they are:

- * NATS (server)
- * POSTGRESQL (server)
- * HTTPS (server)
- * ONAIR (server or client)