

# Streambox Server

## *Beta Manual and FAQ*

<b>Notice</b>	<b>2</b>
<b>Introduction</b>	<b>2</b>
<b>Set Up Streambox Server</b>	<b>3</b>
Requirements	3
Platform	3
Hardware	3
Encoder/Decoder/Player Versions:	3
Network Requirements:	3
Ports	3
Bandwidth	4
Installation	4
Install on AWS EC2 using AMI	4
Install on your own server	4
<b>Connect to the Server</b>	<b>5</b>
Activation	5
<b>Create Session</b>	<b>6</b>
Session List	6
Request a new Session	7
Configure the Encoder	8
Metadata	8
Network	9
Transport Protocol	9
Video/Audio quality settings	9
<b>Start the Stream</b>	<b>11</b>
Monitor client connection status	11
<b>Frequently Asked Questions</b>	<b>11</b>
GENERAL FAQ	11
Q: Is Streambox Server different from a Cloud server?	11
Q: Where does the Server run?	11
Q: If a session runs out of time will it stop?	12
Q: Can a session be extended or re-started?	12
Q: What is Broker?	12
NETWORK FAQ	12
Q: Why use different ports or a range of ports?	12
Q: How does the Server use the ports?	12
Q: Is it very bad if two sessions share a port?	12
Q: What if multiple encoders are sending streams to Streambox Server?	12

TRoubleshooting FAQ	13
Q: Error message "Broker Service Not available"	13
Q: The server shows an incoming stream, but no session is indicating the incoming.	13
Q: On the stream that is coming in, the metadata and session ID shown don't match any sessions.	13
<b>Contact Information</b>	<b>13</b>
<b>Privacy Notice</b>	<b>13</b>

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# Notice

This is a draft manual being distributed to beta users of Streambox Server, and updates and changes are expected as the software evolves. Contact Streambox Support (see Appendix) if you have questions that are not answered by this manual, or experience things that do not match what is claimed in this manual.

# Introduction

Streambox Server is a lightweight software application which will allow the user to send from one Encoder to multiple Decoders and Media Players without the use of the Streambox Cloud Service. At the user's request, Streambox Server will create simple codes to be entered into the Encoder, and sent to clients/reviewers to put into their Decoders and Media Players, and the Streambox Server will work with an online asset called Broker to negotiate the connections from the Streambox Server to the Client/Reviewer's Media Players and Decoders.

# Set Up Streambox Server

## Requirements

### Platform

Streambox Server runs on Ubuntu Linux, version 20.04 “Focal Fossa” and above.

Version 20.04.6 AMD64 for 64-bit Intel platforms:

<https://cdimage.ubuntu.com/focal/daily-live/current/>

Version 20.04.5 ARM64 for ARM platforms such as Apple Silicon:

<https://cdimage.ubuntu.com/releases/focal/release/>

### Hardware

Hardware requirements can vary depending on the activated version.

Tier	Number of encoder connections	Number of decoders / players per encoder	Add-ons available	CPU Cores	RAM (GB)	Clock Speed (GHz)	Disk (GB)	AWS EC2 Recommended Minimum	Mac Mini Recommended Minimum
Free	1	5	None	2	2	2.0	60	t2.small	Early 2009 w/ 2GB RAM
Small	2	5	+5 encoders	2	4	2.0	60	t2.medium	Early 2009 w/ 4GB RAM
Medium	5	5	+5 encoders	4	8	2.5	80	t2.large	Late 2012 i7 w/8GB RAM
Large	Unlimited	Unlimited	N/A	4 - 16	8 - 32	2.8 - 3	100	t2.large - t2.xlarge	Late 2012 i7 w/8GB RAM

### Encoder/Decoder/Player Versions:

Streambox Encoders with the 2023.x Update will have the ability to use Streambox Server.

Streambox Media Player for MacOS and iOS 3.0.12 and later will support Streambox Server connections.

### Network Requirements:

#### Ports

If it is to be used outside of the local network (either by encoder or decoders), Streambox Server will *require* access to the internet bidirectionally using at least one UDP port. The default is 1770/udp. Adding additional ports to Streambox Server will mean allowing bidirectional access to those ports as well.

Any UDP ports to be used by Streambox Server will *require* that the ports are Port-Forwarded to the server. Configure the firewall protecting the local network on which the Streambox Server resides to both allow the ports and also set port forwarding. Opening ports alone is not adequate.

Alternatives to Port Forwarding are NAT (Network Address Translation), PAT (Port Address Translation), and assigning the Streambox Server its own IP address using DMZ.

## Bandwidth

Bandwidth between Encoder and Server is the sum of incoming and outgoing streams. For a given encoder, one can determine this by the Target Bitrate setting in the Encoder, multiplied by the number of streams, one incoming and however many outgoing. Repeat that process for each active encoder.. Though in some circumstances, such as severe network congestion on the LAN, the Encoder may exceed that bitrate, usually the rate will be at or below the target rate.

If the Streambox Server is positioned inside the local network, the bandwidth required for streams coming out of the Server will be the Target Bitrate multiplied by the number of connected clients. This bandwidth requirement may potentially influence the decision as to whether the Server should be run locally or in the Cloud.

## Installation

### Install on AWS EC2 using AMI

This AWS machine image loads the Ubuntu OS image appropriate for Streambox Server Installation.

<https://aws.amazon.com/marketplace/pp/prodview-iftkyuwv2sjxi>

### Install on your own server

To install, log in to the server. Access a command-line window (or use SSH to log in from the start). If not logged in as the root user, either **su** to the root user, or use **sudo** before each command. You will be prompted for the root password at least once either way.

To install or update your current install, run the below command.

```
bash -c "$(curl -fsSL https://streambox-lightserver.s3.us-west-2.amazonaws.com/install.sh); install"
```

# Connect to the Server

Using a web browser, connect to your Streambox Server by its IP address or a domain name that you've assigned to it using this URL:

[https://\[server.ip.or.domain\]/light/light\\_status.php](https://[server.ip.or.domain]/light/light_status.php)

Log in to the server; the default credentials are **admin / demo**

Coming soon: There will be two different views for the Streambox Server users to see. A more friendly simplified interface for the typical user such as the Colorist or Producer, and a more detailed view for administrator users and IT support, which discloses more information about current activity within all current sessions.

## Activation

With your purchase or renewal of Streambox Server software, you should receive a 7 digit product key which will serve as your activation code.

The Activation status is found in the Support section at the bottom of the page. The "Config" line will either indicate "Activation required" or will indicate the tier activated, such as "Light" or "Full."

If Activation is required, click the linktext "activation" and this "SLS Activation" will appear. Fill in the fields of the form, with the final field containing the 7-digit product key. The Device field is optional. This information is not shared outside of Streambox, but is used to help distinguish activations by multiple people within the same company or volume license.

If activating online fails click the "Go Offline" button and send the displayed Hardware ID to Streambox Support, along with your 7-digit product key. The support tech will generate an activation code that will work offline.

### Support

Version: 2.2.65 (Aug 23 2023)

Expires: not activated

Config: ([activation](#) required)

Email: [support@streambox.com](mailto:support@streambox.com)

Phone: +1 206.956.0544, Option 2

Guide: <https://www.streambox.com/knowledgebase/getting-started-with-streambox-server>

Restart Service

### SLS Activation

First Name

Last Name

E-mail

Device

Product key

Activate

go Offline

Cancel

# Create Session

## Session List

The top of the page lists existing sessions and their specifications:

### Available Encoder/Decoder Session IDs:

#	NAME	Encoder	Decoder	Live	Ports	Created	Expires	Params	Actions
1	Color test B	\$SAR64P	\$RWNX9U	1771	2023.09.07	23:00:25	23:57:36	ldmp	<a href="#">Edit</a> <a href="#">Delete</a>
2	Acme Campaign Final	\$SWN83T	\$R77EHX	1772	2023.09.07	23:01:01	05:58:12	color	<a href="#">Edit</a> <a href="#">Delete</a>
3	4K Reel	\$SLHBOF	\$RHQN7Q	1773	2023.09.07	23:01:41	3d 23:58:52	net	<a href="#">Edit</a> <a href="#">Delete</a>
* Request public Session from Streambox Broker									

- **#** and **Name** are the number and name of currently available sessions.
- **Enc** and **Dec** are the Session codes to be added to the two different ends of the stream: “enc” goes into the Encoder Metadata and “dec” is entered into the Decoder/Media Player as a Session ID.
- **Live** will indicate a number as soon as Server begins to receive a stream pointed at that Session. The number that appears will be the number of connected clients. Also when the stream starts, this number and the session codes will turn red:

**5**   **BetaTest1**   **\$SCSPN8**   **\$R6E1NP**   **1**

- **Ports** will show either “any” or a single port or range of ports. These are the UDP ports at which the Streambox Server will allow clients/viewers to connect using their Decoders/Media Players.
- **Created** will show the creation time of the Session if the Session has a time limit. If the Session has unlimited lifetime, this field shows “auto”
- **Time left** shows the time remaining in the session
- **Params** will indicate with abbreviations if any network or color parameters have been changed using the Edit button (see below).
- **Edit**: Open additional settings by checking the box next to the items. Leave the box checked and click Save to enable the parameter. Disabling the parameter will clear any changes made to its settings.
  - **Network Protocol**: Select UDP (monodirectional) mode or LDMP (bidirectional) communication between Streambox Server and each client/viewer. LDMP has improved error correction but may

### Overwrite session options:

- ☒ Network protocol
- ☒ Chat password
- ☒ Color
- ☒ Network options

### Network protocol

**proto**      ☐ UDP   ☒ LDMP

**ack\_to**     

**snd\_to**     

**cwnd**     

**Chat password**

require tuning some parameters. Selecting LDMP will reveal the parameters.

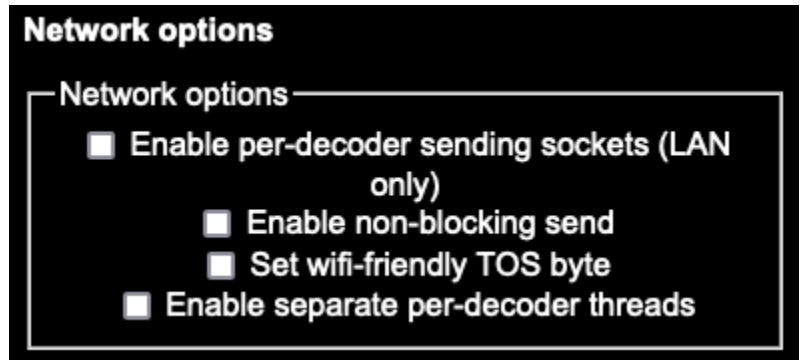
- **Chat Password:** Set a password (use only letters and numbers) for the Session's chat.
- **Color:** Set the color space of the stream to be set in the Streambox Media Players used by clients. The media players must have their own color space setting set to Auto for this Server setting to work. This setting on the server **can be overridden** by the Encoder's color space setting.

A dark-themed UI element titled "Color" in white. Below the title is a light gray dropdown menu with the text "Auto-Detect" and a small downward arrow on the right.

- The color space will automatically be implemented if sending to Streambox hardware decoders.)

- **Network Options:** Enable these options if Clients fail to connect to the stream, particularly when the client is using Wi-fi.

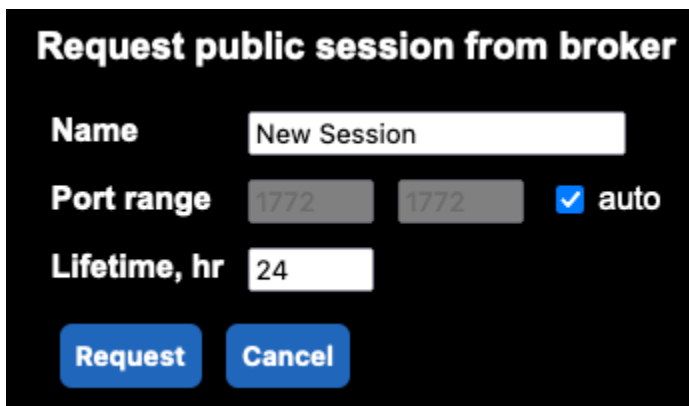
- **Enable per-decoder sending sockets (LAN only)**
- **Enable non-blocking send**
- **Set wifi-friendly TOS byte**
- **Enable separate per-decoder threads**

A dark-themed UI panel titled "Network options" in white. It contains a sub-header "Network options" followed by four checkbox options: "Enable per-decoder sending sockets (LAN only)", "Enable non-blocking send", "Set wifi-friendly TOS byte", and "Enable separate per-decoder threads".

- **Delete:** Delete the session permanently, without confirmation.

## Request a new Session

The first step is to request a new Session. Click the **Request public session from broker** link to create a new session. Broker is a Streambox-maintained online asset which negotiates the stream connection between server and client once a stream is established. Here's the blank form and an example.

A dark-themed form titled "Request public session from broker" in white. It contains three input fields: "Name" with the text "New Session", "Port range" with two input boxes containing "1772" and a checked checkbox followed by the text "auto", and "Lifetime, hr" with the text "24". At the bottom are two blue buttons labeled "Request" and "Cancel".

Give the Session a name related to the project or clients/viewers. As a general rule, one should create a different Session each time one has a different set of clients/viewers.



### Request public session from broker

**Name**

**Port range**   ☐ auto

**Lifetime, hr**

**Name:** Enter a name, for your reference only, for the Session.

**Port Range:** If Auto is checked, the session will be assigned a single port that's available.

To enter a single port, enter that port number both boxes.

To enter a range of ports, enter the lowest port number in the first box and the highest port number in the range in the second box.

**Lifetime:** The lifespan of the Session in hours. If left blank, Lifetime will be set to "unlimited."

The Name and Port Range fields are required to successfully generate a Session.

After clicking the Request button to request the Session, a pair of codes appear:

**Session pair has been generated**

**(dec) \$R6E1NP : \$SCSPN8 (enc)**

Click the OK button to return to the main screen. Now the Session is displayed in the list:

5	BetaTest1	\$SCSPN8	\$R6E1NP	1775-1776	2023.08.29 20:50:58	00:58:43	<a href="#">edit</a> <a href="#">delete</a>
---	-----------	----------	----------	-----------	---------------------	----------	---

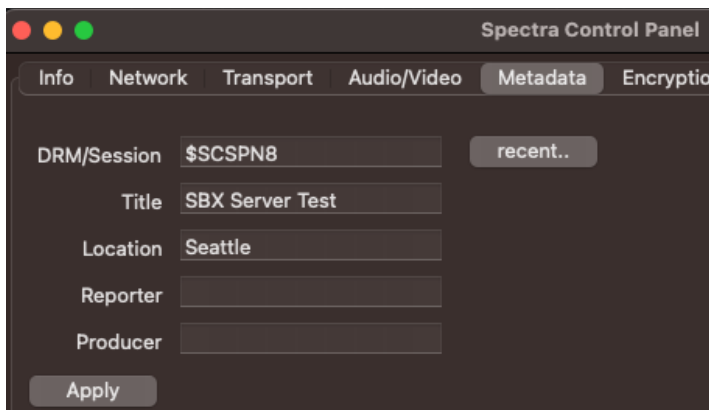
After editing a few parameters using the Edit button and also stating a stream, it looks like this:

5	BetaTest1	<b>\$SCSPN8</b>	<b>\$R6E1NP</b>	<b>1</b>	1775-1776	2023.08.29 20:50:58	00:11:50	color, net	<a href="#">edit</a> <a href="#">delete</a>
---	-----------	-----------------	-----------------	----------	-----------	---------------------	----------	------------	---

## Configure the Encoder

### Metadata

Take the Encoder code (enc) and enter it into the DRM/Session field of the Metadata tab in Streambox Spectra. If using Streambox Chroma or Spectra SDI, use the DRM/Group field found in the System Tab.



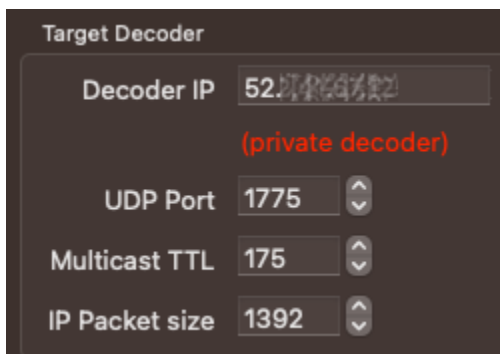
Screenshot is from Streambox Spectra for MacOS

Share the Decoder (dec) Code with the people whom you want to view the stream, and instruct them to enter it into their Media Player or Chroma as they would a Session ID. ***The \$ is required.***

## Network

In your Encoder, the following Network settings are required:

- Set the Decoder IP (sometimes called Target IP or Destination IP) as the IP Address of your Streambox Server.
- Set the UDP port (to the port set in your Session). In this document's example, 1775 is the port.



Screenshot is from Streambox Spectra for MacOS

## Transport Protocol

If the Streambox Server is a machine on the local network (genuinely local, not remote but accessible over VLAN), we recommend using the UDP protocol in the Transport settings on the Encoder. **Otherwise, use LDMP.** This setting is either found in the Transport tab (Spectra) or the Network tab (Chroma).

## Video/Audio quality settings

Set the Video/Audio settings of the stream to your preferences. For Color Space, the color space of the stream can be configured here, or in the Session (within the Streambox Server) or in the media players/software decoders used by each client. We recommend setting the Color space in the Encoder or in the Streambox Server to set uniform output.

The color space setting does not affect hardware Decoders because they do not have a display; they output a full-fidelity datastream through their SDI outputs.

## Video

Resolution FULL

Color Profile 4:2:2

Color Space P3 D65 PQ Full

Key frame 100

Advanced Profile

Color Bit Depth 10

Framerate Full

## Audio

AudioCodec AAC

AudioChannels 2-ch(Stereo)

SampleRate 48k

Apply Audio/Video Settings

# Start the Stream

On the Info tab of your Encoder, start the stream.

## Monitor client connection status

On Streambox Server, the Session list now indicates that a stream is being received

5   BetaTest1   **\$SCSPN8**   **\$R6E1NP**   1   1775-1776   2023.08.29 20:50:58   00:11:50   color, net   [edit](#) [delete](#)

Additionally the Streams info section indicates an incoming stream, and describes its parameters: Session DRM, Title (from the encoder metadata), bitrate and video quality settings, encoder version with origin IP address, and duration.

### Streams info:

1. \$SCSPN8  
BetaTest1  
4061kbps 1920 x 1080 x 30.00, AAC 48KHz 2 ch  
MAC, v5.104, [REDACTED]:7771  
1300s

When a client's Decoder or Media Player connects, it will be listed on the Server interface near the bottom:

### Streaming to 1 decoders:

#	ip:port	sid	server port	bitrate	last active, s	max timeout, s	Packets/Resent/%	RTT/Avg/Peak	Ack timeout
1	[REDACTED]:1770	\$R6E1NP	1775	1425	5	9	315996/93/0	25/24/68	300

# Frequently Asked Questions

## GENERAL FAQ

### Q: Is Streambox Server different from a Cloud server?

A: Yes; Streambox Server is a software product, to be run on hardware that is owned, operated, and maintained by the customer company and is not a shared service with other Streambox customers. In other words, it's a dedicated server software instead of a service.

### Q: Where does the Server run?

A: The Server application can be run locally on some PC or Mac hardware, or the Cloud using e.g. an AWS EC2 virtual machine.

**Q: If a session runs out of time will it stop?**

A: No; the stream will continue as normal for clients connected to the stream, but it won't allow clients to start a new connection to the stream.

**Q: Can a session be extended or re-started?**

A: No, but re-creating the session soon after can often result in the same session codes being used.

**Q: What is Broker?**

A: Broker is an online asset managed by Streambox which connects to both the Streambox Server and Decoders/Media Payers to negotiate the connections between clients and Server. Both Server and all clients must be able to connect to Broker.streambox.com (107.23.6.109) in order for the Server's Sessions to work.

## **NETWORK FAQ**

**Q: Why use different ports or a range of ports?**

A: Encoders sending streams through Streambox Server must send on different ports. With respect to clients/viewers connecting, spreading the streams over multiple ports will improve server and stream performance, and so it's best to assign different port ranges to different sessions when possible. We recommend that the users set up their sessions so ports don't overlap. However, if overlap occurs, the server will still function.

**Q: How does the Server use the ports?**

A: The server sends its own IP and port information to Broker, and Broker assigns the ports used by incoming client connection requests. If you specify for example the range 1770-1775 for a session, Broker will auto assign a port ID for each client connection request, using a port in the 1770-1775 range.

**Q: Is it very bad if two sessions share a port?**

A: No, but the server has to work harder and it may result in poorer performance, depending on the current load on the server machine.

**Q: What if multiple encoders are sending streams to Streambox Server?**

A: Each encoder should be set to stream to a different port number.

# TROUBLESHOOTING FAQ

## **Q: Error message "Broker Service Not available"**

A: One possible reason is that the Ubuntu Certificate was not updated. There is a Chroma update package available to remedy this: **ca-certificates\_20210119~16.04.1.sb1\_all.deb**. This will be part of 2023.x update. Another possible reason is that the Streambox Server cannot connect to the Broker server (broker.streambox.com). Check network connectivity.

## **Q: The server shows an incoming stream, but no session is indicating the incoming.**

A: Most likely the encoder user accidentally failed to click the Apply button when setting the metadata.

## **Q: On the stream that is coming in, the metadata and session ID shown don't match any sessions.**

A: Most likely the encoder user accidentally failed to click the Apply button when setting the metadata.

## Contact Information

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## Privacy Notice

<http://www.streambox.com/streambox-inc-privacy-policy/>