

Streambox Cloud Services

USER GUIDE

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1 Streambox Overview

The integrated Streambox solution for both live stream and file-based video acquisition comprises the Streambox Cloud Services, the Streambox IFB Server, and a variety of Encoding and Decoding hardware and software.

The solution provides enhanced management of field-generated video in the form of multiple incoming files and live streams, as well as storing live stream as files for editing and playout, using our proprietary video codec, Advanced Compression Technology – Level 3, or ACT-L3.

1.1 Streambox Cloud Services

The Streambox Cloud Service is capable of receiving multiple simultaneous video streams from multiple sources, as well as multiple incoming files. It features a web-based interface enabling the operator to view metadata and thumbnail views of incoming video streams and files. It enables the broadcaster to manage, monitor, and prioritize incoming streams and field-edited files as they are uploaded to the Streambox Cloud Service from field reporters or remote bureaus. The Active Connections metadata and Video Clip Thumbnails and Flash previews help the operator gain greater control and visibility into the progress and status of stream uploads.

Features

- Integrated platform for live stream and file-based acquisition
- Ingests live ACT-L3 streams and ACT-L3 files
- View incoming live video streams with Streambox Media Player
- Provides metadata information via web-based interface
- Accepts multiple simultaneous connections
- Thumbnail and flash video preview
- Live stream playout to web, including YouTube, Facebook, and an embeddable video player
- Streambox Avenir remote access portal

1.2 Streambox Encoders

Streambox offers a variety of Encoding hardware, both analog and digital Standard Definition and High Definition. Additionally, Streambox software Encoders are available for Mac OSX and Windows platforms using DV and, with the addition of supported signal converters, SDI and HDMI audio/video input for SD and HD encoding. Streambox iPhone and Android Encoders support SD encoding. All of these Encoders make use of the Streambox ACT-L3 codec for efficient and fast video compression and can stream live video to the Cloud Server or record files for later transfer to the Cloud Server.

1.3 Streambox Decoders and Media Players

Streambox Decoders and software Media Players can receive live ACT-L3 streams from Streambox Cloud Services as well as play out recorded streams and uploaded ACT-L3 files. HD Hardware Decoders offer baseband analog and digital outputs for SD and HD video and can up-convert the output to provide the

preferred HD output format as desired. SD and HD Media Player software can display ACT-L3 live streams and play out ACT-L3 files on Windows or Mac OS computers.

2 Accessing Streambox Cloud

2.1 Connecting to Streambox Cloud

The Streambox Cloud Services are operated using a web interface. This web interface can be accessed using a web browser such as Google Chrome, Mozilla Firefox, or Apple Safari. Other web browsers may not be supported. The web interface enables Streambox Cloud Services to be managed by multiple users and flexibility in its location on the network.

In your web browser, navigate to the following address:

http://live.streambox.com

You can also reach one of our individual servers directly using its specific address. As of this publication, these are our active servers and their locations:

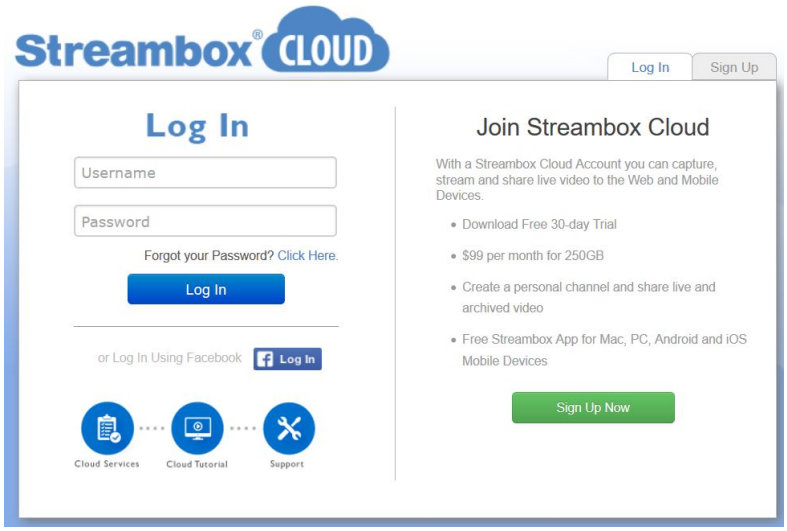
Name	Description
LiveUS.streambox.com	USA (Oregon)
LiveUSEast.streambox.com	USA (Northern Virginia)
LiveAU.streambox.com	Asia Pacific (Sydney)
LiveDE.streambox.com	Europe (Frankfurt)
LiveEU.streambox.com	Europe (Ireland)
LiveJP.streambox.com	Asia Pacific (Tokyo)
LiveSA.streambox.com	South America (Sao Paulo)
LiveSG.streambox.com	Asia Pacific (Singapore)
LiveIN.streambox.com	India (Mumbai)

See the link in Appendix A for an up-to-date list of servers.

NOTE: It is strongly recommended that, for best function, you connect your browser to the Domain Name of either Live.streambox.com or an individual server using its name, such as LiveSG.streambox.com, rather than using a numerical IP Address.

2.2 Login

Connect to the login screen by opening a supported web browser and entering the server name (as listed above or public IP address from Appendix A) of the Streambox Cloud Server into the address bar and hit Enter or click “Go” in the browser.



2.3 Trial Account

You can sign up for a new trial account at http://live.streambox.com/ls/reg.html

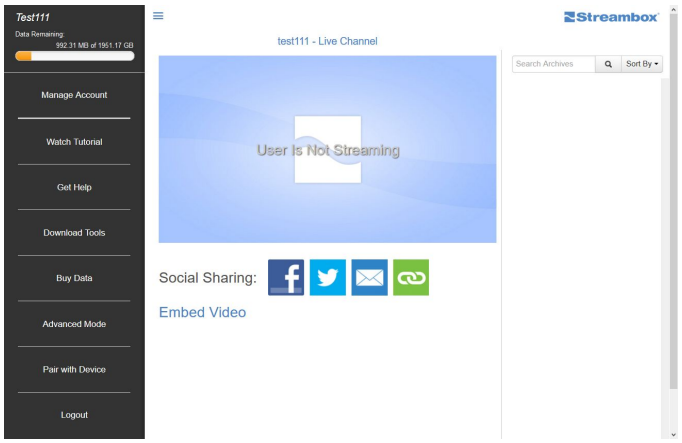
Trial accounts will only work for 30 days, and have 1GB of data for streaming.

2.4 Live Channel Menu

When logging in to Streambox Cloud, you may be taken to the Live Channel screen or the Advanced Mode screen, depending on your account settings.

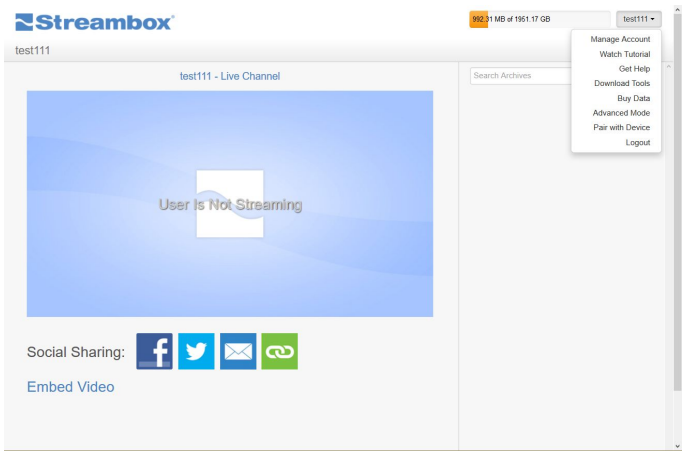
The images below show the Live Channel screen (in two versions, mobile and desktop), and the Advanced Mode item on the dropdown menu. The next two sections of the document will cover the Live Channel and Advanced Mode items separately.

Live Channel screen (mobile) with menu on the left side:



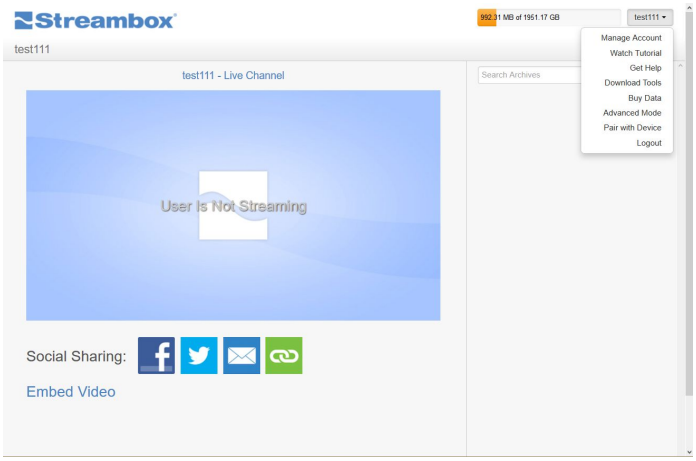
In the mobile version, access the menu using the

Live Channel screen (desktop) with menu in the upper right:

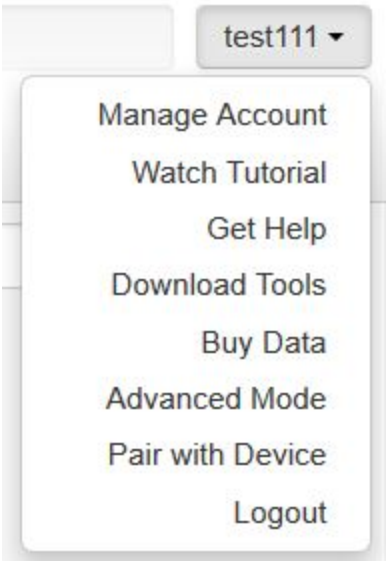


In the desktop version, access the menu by clicking

pancake stack" menu button, upper left:  on your username in the upper right.



Selecting Advanced Mode from Menu:

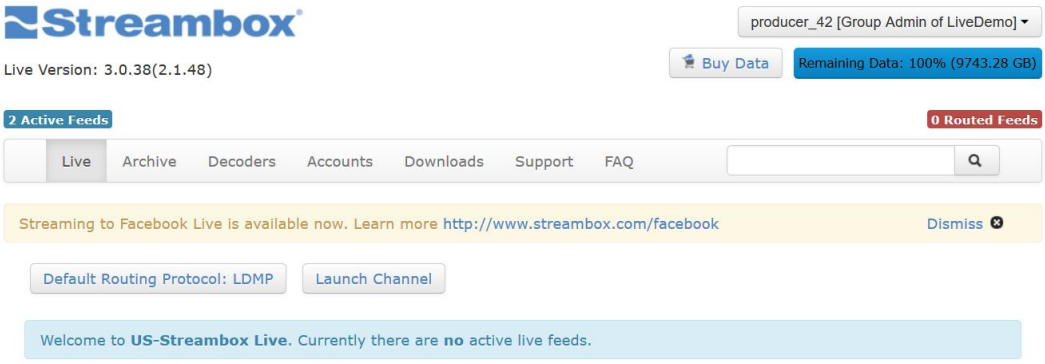


Close-up of the right-hand menu

You can switch from the Live Channel screen by selecting "Advanced Mode" from the menu. You can switch from Advanced Mode to Live Channel by selecting "Launch Channel" in the upper right corner menu.

2.5 Advanced Mode

The Advanced Menu Mode displays configurations for managing non-web livestreams, file playouts, file management, as well as all manner of setup, accounts, and billing. Refer to sections 4 & 5 below for using the Advanced Menu.



3 Sending Live Streams to Cloud Server

Sending Live streams to the Streambox Cloud is as simple as setting the Server's IP address as the target Decoder IP in your Encoder of choice. The default port remains 1770. However, if that port is needed elsewhere on your network, the Streambox Cloud can be set to listen for incoming streams on different ports.

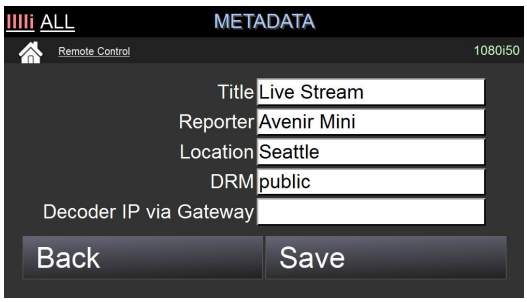
The current list of Cloud Server IP addresses found in Appendix A: Cloud Server Addresses

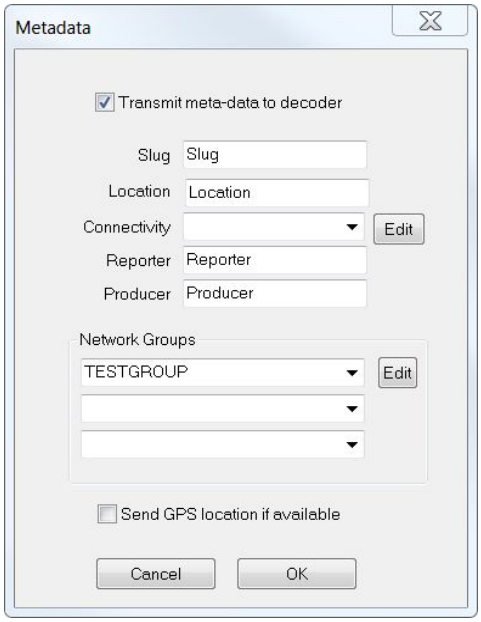
3.1 Metadata

The Streambox Software Encoders have a Metadata Menu that includes the fields and a checkbox to enable the transmission of the metadata. The Streambox ME Pro Encoders automatically enable Metadata, as do the Streambox Avenir encoders. Streambox Hardware (Rackmount) Encoders also have a Metadata menu which can be accessed either through the Web Interface on the unit, or the Windows Interface, or even the LCD Panel Interface.

In general, the Metadata should be left on to help facilitate transmission; but specifically for Streambox Cloud, it is required for the Cloud server to receive and sort the incoming streams. The Cloud Server uses the Group Field of the Metadata to identify which cloud users are allowed to view the live stream or file playout. Every Cloud user is assigned to a group, usually one that encompasses their company. On the other hand, Live Trial users have a group that is an email address, typically.

IMPORTANT NOTE: In order for the Streambox Cloud to acknowledge an incoming stream, the stream *must have Metadata enabled and contain a valid* Group *code.* Group *is sometimes labeled as "DRM" or "Network group."* See the included image, which displays the Group code TESTGROUP entered in the first "Network Groups" field of the Windows Encoder (software or rackmount), and an Avenir web UI Metadata screen which shows the setting as DRM, currently set to "public."

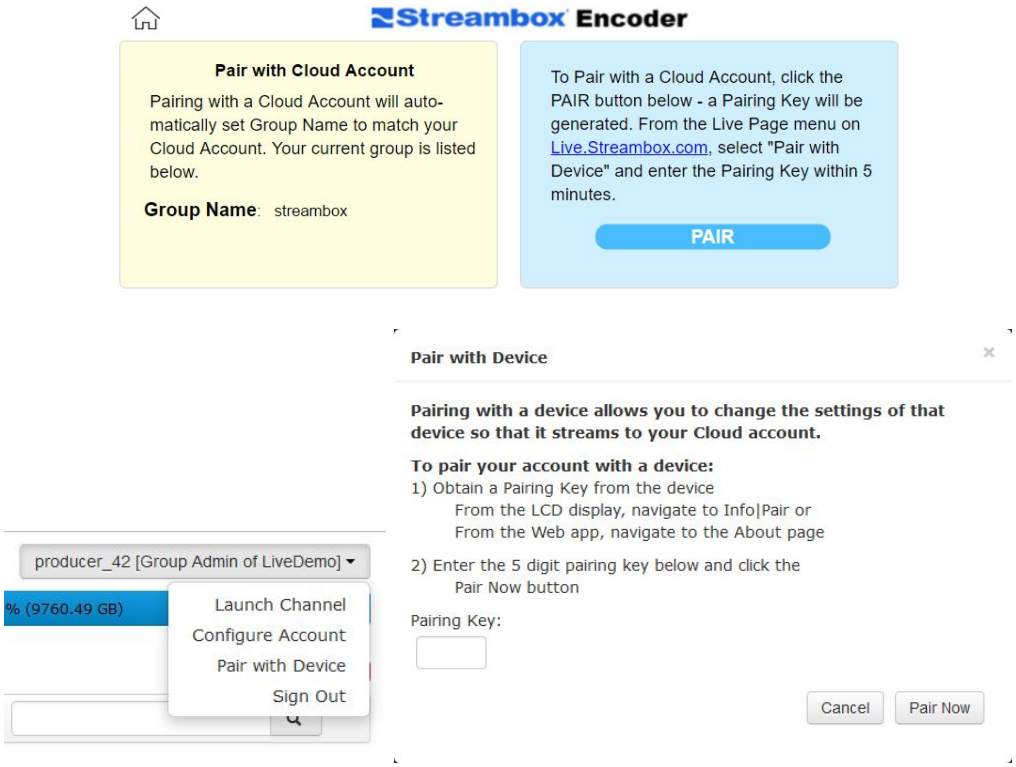




3.2 Device Pairing

Avenirs Micro and Drone both support device pairing to easily assign the Group Name to a device. To obtain a pairing key, from the Mobile user interface (**http://*<device address>*/micro/**) menu, select Pair Device, then

on the Pair with Cloud Account page (see image below), click the PAIR button. Copy the key (it takes about 10 seconds to receive the key) and click on the 'Live.Streambox.com' link on that page. Once the Live server is loaded, log in, if needed, and from the menu select 'Pair with Device'. Enter the pairing key and click the 'Pair Now' button (see 'Pair with Device' image below). That's it — in about 20 seconds, your device will be paired with your Cloud account.



Viewing Streams

The next two sections describe how to view streams sent to the Streambox Cloud.

- See Section 4 for viewing and managing live streams and playing them with Streambox Decoder and Media Player.

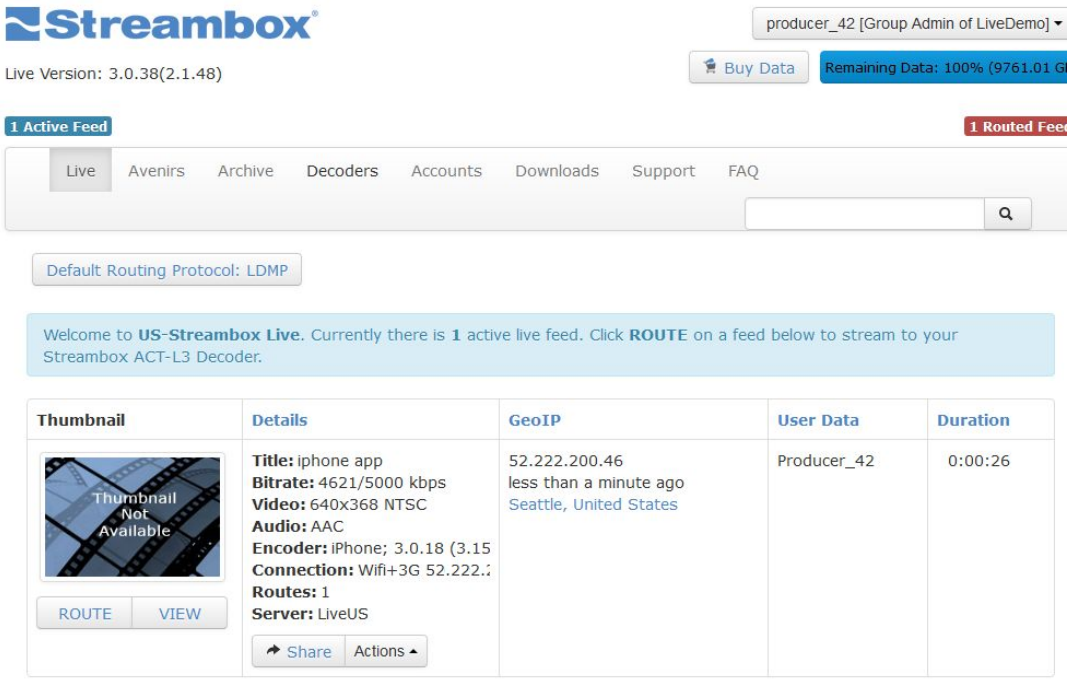
- See Section 5 for web streaming, including streaming over social media; e.g., Facebook, YouTube, Twitter, or other content distribution network (CDN).

4 View and Manage Live Streams

4.1 Advanced Mode

The Live tab lists all live video streams that are currently streaming to the Streambox Cloud Services for a specific Group. The streams listed can be filtered for easy searching of metadata via the search field.

NOTE: On this and all other tabs, a user can click the column heading to sort by that column, and click the same heading again to reverse the sort-order.



For each stream, the **Details** column displays information about the Encoder and its settings:

- **Bitrate:** Displays the current (instantaneous) and Target bitrate of the stream
- **Video:** Displays the Video resolution and standard (NTSC or PAL)
- **Audio:** Displays the Audio codec setting
- **Encoder:** Displays the Encoder platform/OS, and its version number
- **Connection:** Displays the connection(s) used by the Encoder to stream to the cloud, and an origin IP address
- **Routes:** Displays the number of Decoders or Media Players to which the Stream has been routed (whether using a Decoder stored in the server, or an *ad hoc* decoder created by the View button)
- **Server:** Displays which of the Cloud Servers is receiving the stream directly
- ***GPS:** If the encoder device has a GPS receiver, GPS coordinates will be displayed (*not displayed here)

The **GeoIP** column displays the origin IP address (preferring a LAN or WiFi connection) and performs a GeoIP lookup on its location. The location is not always reliable because not every IP's location is recorded in a public index.

Additionally, the metadata are displayed, including **Title**, **Contributor or Reporter** ("**User data**"), and **Duration** (HH:MM:SS).

Routing a Live Stream

To route a live stream to a Decoder that's been set up on Streambox Cloud Services, click the **Route** button of a specific stream. The browser will take you to the Decoders tab to select a Decoder, and then click **Start** next to each desired Decoder. The process of adding a Decoder is described in Section 3.4.

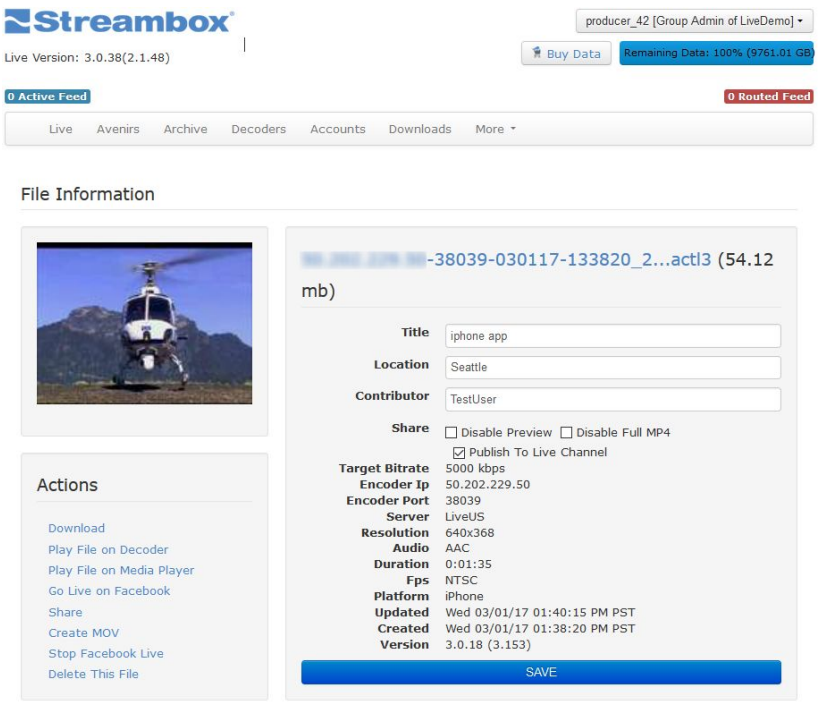
Once completed, this process will display the live stream on the Decoder with minimal additional latency. The number of current Decoders or media players currently receiving the stream is shown as the number of Routes in the stream details section. Note: To see the current status of a routed stream, you must be logged onto the same server as is receiving the stream; otherwise the status values are not updated, even though the decoder is receiving the stream.

Preview a Live Stream

To preview a live stream on the Media Player, open the Streambox Media Player on the local computer and click the **View** button on a selected stream on the Live page. The stream should start to playout within 30 seconds; it may be preceded by a few screen flashes and a few seconds of rendering the full image.

In the upper right corner of this page, above the search bar, a message will indicate the number of routed feeds. Routed feeds are live streams that have been routed to Decoders or media players.

To see detail on the Live stream, click on the thumbnail image. That will take you to the below page:



On this page you can view the qualities of the live stream including video settings, bitrate, video standard, length and time of stream and current size as well as three fields for metadata: **Title**, **Location**, and **Contributor**. Those metadata fields can be edited by some users. Click the save button to save your changes.

You can click on the filename (highlighted in blue at the top) to download the video to your hard drive (to the point that it is recorded). Or select "Download" from the list of Actions.

Other Actions Include

Route to Decoder which, as from the main Live Tab sends the current video stream to a Decoder, and **View Stream on Media Player** which allows the user to play the stream locally. In both cases, the stream will playout live, not from the beginning. These two functions are identical to using the "Route" and "View" buttons, respectively.

To view the stream on a Decoder from the beginning of the stream, click the **Play File on Decoder** link and then select the Decoder. Likewise, **Play File on Media Player** will begin to download the file on the local machine to play from the beginning on the Streambox Media Player.

To end the recording of the file, click **Stop Archiving** link under the Actions menu.

Press **Restart** to clip or interrupt an active stream and begin receiving it as a new stream. This is a convenient way to insert a break into a lengthy live stream with the smallest possible interruption. Restart can also be used in the rare case where a stream does not appear to correctly terminate itself (e.g., when the source has been discontinued). Only Group Admin-level users can use the Restart command.

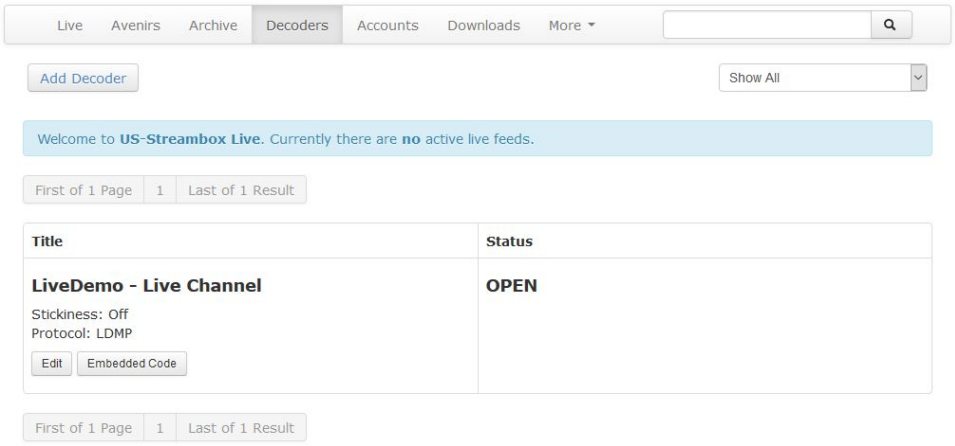
There are some additional features on this page, **Formats** and **Time Shift**, which are described in later sections.

4.2 Decoders

Streambox ACT-L3 Decoders and Streambox Media Players can be added to the Streambox Cloud Service so that live streams coming into the Streambox Cloud can be routed to Decoders and Media Players for playout.

The Decoders tab on the Cloud Server Web Interface displays all available Decoders or Media Players that have been added by users.

The items shown are "Virtual Decoders," much like installing a printer on a workstation is considered a "virtual printer." Though called "Decoders" here, any Streambox Server, Streambox Media Player, Streambox Decoder, or other device that's capable of receiving a Streambox live stream can be added as a virtual Decoder; including social networks like YouTube, Facebook, Twitter, and other content distribution networks (CDN).



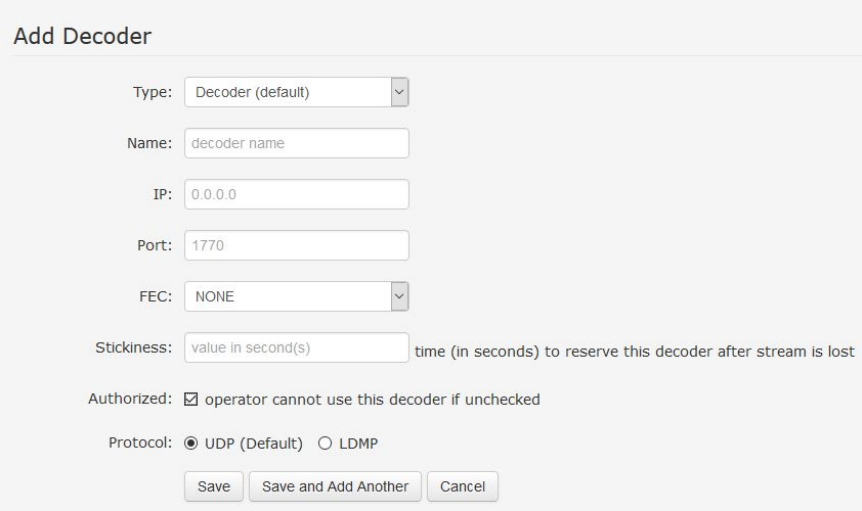
NOTE: In this circumstance, the Streambox Media Player is considered to be the software version of the hardware Decoder; the two are treated identically by the Streambox Cloud when it comes to the routing of live streams.

Each Decoder is listed along with its IP address and port number, group settings, and on the right side, either the word “Open” indicating that the Decoder is available, or with a thumbnail image and title of the incoming video stream that has been directed to it. If a stream was sent to a Decoder and then the stream was dropped, the Decoder may also show a message indicating that it is counting down to the end of its “stickiness” period (see ***Adding a Decoder*** below) before it is available for another stream. That is, the Decoder is waiting for an interrupted stream to resume during the “stickiness” period, beyond which the the stream will be considered terminated and the Decoder will return to its open state.

To the upper right side is a pull-down menu that can help filter the displayed Decoders, if there are numerous Decoders or Ad-hoc Decoders listed. By default, the **Show All** setting displays all stored and ad-hoc Decoders currently available for the Group. The options include **Only Decoders** which excludes Ad-hoc listings, **Only Adhoc** which excludes stored Decoders, and **Only Busy Devices** which shows only Decoders (including Ad-hoc Decoders) that are currently receiving a file or stream from the server. Additional filter items include **Only Live Channel** which filters out all except web streams, and **Only Facebook Channel** which displays only streams routed to Facebook.

Adding a Decoder

To add a Decoder or Media Player with a permanent (or long-term) fixed IP address to the Streambox Cloud Server, click the **Add Decoder** button.



This same screen appears if you attempt to Edit an existing Decoder.

For each Decoder or Media Player, these fields must be filled in:

- **Type**: Set to **Decoder (default)**. The other available option, **Live Streaming Channel**, is for streams going to web playout, and is described in Section 5.
- **Name**: Enter a **name** for the Decoder that will uniquely identify it.
- **IP Address**: Enter an publically-accessible **IP address**, a destination for the stream.
- **Port**: Enter an **IP address** and a **Port number** on which that Decoder listens for a live stream. The port can be changed on the Decoder, but by default, the port is 1770. Each Decoder created must have a unique combination of IP address and port.
    - **NOTE:** The port number, 1770, must be filled in by the user; there is an image of the number as a guide, but the field is still blank when creating a new Decoder.
- **Authorized**: This setting is a checkbox which will enable or disable a decoder. A Group Admin can uncheck this box in order to de-authorize or suspend a Decoder from use without deleting it from the Streambox Cloud Server. A Decoder that is not authorized cannot be set to receive a live stream or file playout, so this box should be checked to enable.
- **Protocol**: This setting requires more depth. See the next section: **Network Transport and Error Correction**

Network Transport and Error Correction

There are two options for network transport in the stream from the Streambox Cloud Server to its destination: LDMP and UDP. LDMP is the two-way error-correcting transport protocol that allows the Decoder to give network quality feedback to the Server. UDP is the network protocol that gives no feedback, and is a one-way data stream from Server to Decoder, which listens passively.

NOTE: Both LDMP and UDP Mode use the UDP (Uniform Datagram Packet) Network Protocol packets, rather than TCP packets. UDP packets are, by their nature, “connectionless” and do not require acknowledgment from the receiver. Streambox’s LDMP Transport creates a system of acknowledgment to compensate for this. ***LDMP is the recommended mode.***

Protocol: LDMP

LDMP (Low-Delay, Multi-Path) is Streambox's proprietary Transport Protocol that combines error-correction and latency/bandwidth measurement to compensate for network loss with minimal bandwidth increase, as well as compensate for some sags in bandwidth with minimal impact on picture quality. This is the recommended setting.

LDMP settings in the Streambox Cloud Server are described below. Generally, the two settings that users are likely to want to change from the defaults are ACK Timeout and Buffer Size Packets, in particular, the bitrate limit of that field.



ACK Timeout: The Acknowledgment Timeout (elsewhere called ACK_TO) sets the length of time, in milliseconds, the Server will wait to receive from the Decoder an acknowledgment that any given packet has arrived.

The default setting of "auto;130;1000" is the automatic detection mode, where the Server will send 1000 packets to measure the round-trip-time (RTT, similar to "ping") to the Decoder, multiply the average by 130%, and use that value. However, you can certainly set a manual value based on your estimated normal RTT. It is recommended that you keep it no lower than 100. Below, is a chart with some additional suggested settings.

Setting (milliseconds)	Network quality*/type
auto;130;1000	Automatic measurement setting (default)
100 to 200	Same City, Wired Network
200 to 300	WiFi with low congestion or cross-country Internet
300 to 600	WiFi with medium congestion or trans-continental internet

500 to 700	Highly Congested Wired Network
800 to 1200	3G or 4G Wireless Network (WWAN, Mobile)
2000 to 4000	Satellite (BGAN, Thuraya, etc.)

*****This refers to the quality of the worst network between the Streambox Cloud Server and the Decoder/Media Player.

Echo Packets Size: The size in bytes of the packets sent to measure RTT. Default is 1200 bytes.

Interface Timeout: This time, in milliseconds, that the Server will allow no reply from the Decoder before inferring the Decoder has disconnected from the network. Default is 10000ms or 10 seconds.

Buffer Size Packets: This field contains two numbers: "congestion window" size and bitrate limit.

The congestion window, elsewhere called CWND, is the number of packets the Server will send before it must start receiving acknowledgment data before sending additional packets. The default value is 700 packets, which is a generously high value because the Server is usually positioned on a high-reliability wired connection.

The bitrate limit, measured in kilobits per second (Kbps) is the limit on the output bitrate of the Server to a particular Decoder. The current default is 8000 (see image above). The limit should be set to at least 110% of a typical target bitrate for the streams that are likely to be sent to that Server. However, it should not exceed the maximum download bandwidth for the Decoder's network connection.

Jitter 1 and **Jitter 2:** These fields, measured in number of packets, allow the user to command the size of the Jitter buffers on the Decoder, which are for admitting and re-sorting packets received by the Decoder. Higher Jitter values can result in higher latency.

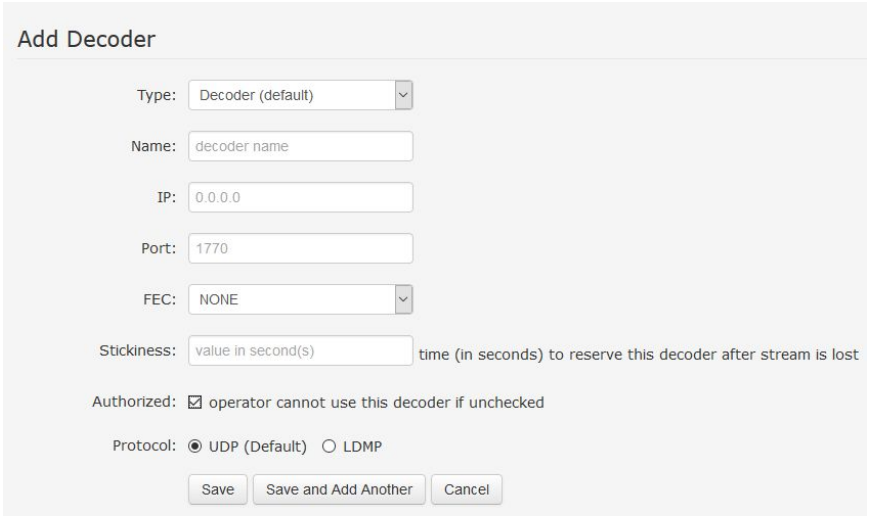
Both Jitter 1 and Jitter 2 setting allow for fixed values, i.e. "100" as well as relative values that modify the commanded values coming in from the Encoder, such as "+15" or "+100." Default values are +15 for Jitter 1, and +5 for Jitter 2.

Protocol: UDP

UDP mode simply forwards all packets from the encoder to the decoder(s). It sends data without any need for an acknowledgement from the decoder. The only way to add any error correction that's not already in the stream (i.e. from the Encoder) is to enable FEC, described below.

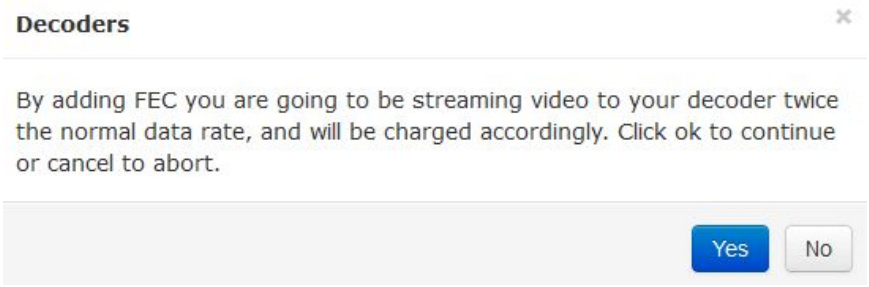
NOTE: LDMP settings on the encoder only apply to the stream from the encoder to the Streambox Cloud. LDMP settings on a Streambox Cloud listed decoder apply to the stream from the Cloud server to the destination decoder.

FEC, or **Forward Error Correction**, works differently on the Cloud Server compared to the Encoder. When enabled, it will send additional bandwidth, in multiples of 100%, rather than adding small amounts of FEC at the expense of signal bandwidth.



The FEC menu shows how much redundancy to add to the stream. The Cloud Server sends multiples of 100% redundancy, so an FEC setting of 2 means that the Server will send 2-times the amount of data, or 100% redundancy, while a setting of 4 means the Server will send 4 times the amount of data, or 300% redundancy.

When adding FEC, a warning message may appear, reminding the user that this will increase the outgoing bandwidth. For example, if FEC is set to 2, the following message appears:



Because the data rate is doubled or more, streaming is more expensive, but the increase in expense relates only to any Internet service costs related to outgoing bandwidth.

NOTE: The default setting of 0 results in no FEC, and setting of 1 will enable FEC but not send any error-correcting packets; it only enables the error-counting on the receiving end. ***A setting of 1 is effectively the same as a setting of 0.***

NOTE: The Decoder or Media Player should have a static or reserved IP address and a reserved inbound port (using port-forwarding on the LAN router if necessary) to permit the stream sent from the Streambox Cloud to reach the Decoder or Media Player.

4.3 Ad-Hoc Decoders

In addition to creating virtual Decoders for pointing to hardware (or at least IP addresses) that are expected to receive the ACT-L3 streams, the Cloud server can create "Ad-Hoc" Decoders on an as-requested basis by Decoders/Players that request the stream. Ad-hoc Decoders are beneficial because they allow the player/Decoder to "pull" the stream to itself, which often allows the live stream to get through a firewall without any special setup.

These appear as newly created virtual Decoders with the name ***Ad-hoc*** and they often use a high-numbered UDP port, as shown in the image below.

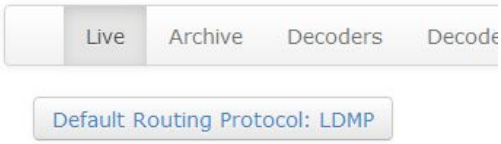


The most common way that Ad-hoc Decoders are created is when a user clicks on the "View" button beneath a thumbnail image on the Live Tab. This button tells the Server "Send the stream to *me*" where *me* is the machine running the browser, whether it's a workstation with a Media Player, or a rackmount Decoder.

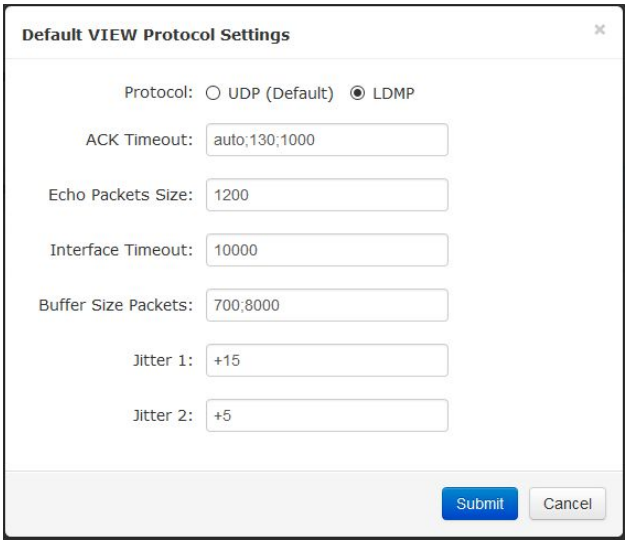
These Ad-hoc Decoders can also be created by setting matching metadata in the Media Player's channel settings. See the Streambox Media Player Manual for details.

Default VIEW Protocol Settings (Default Routing Protocol)

The Ad-hoc Decoders draw their Decoder mode settings from the **Default VIEW Protocol Settings** screen. (See image below) This can be accessed through the button on the Live Tab, just below the navbar, that reads **Default Routing Protocol**.



There, you can select UDP or LDMP mode. If LDMP mode is selected, you can set the LDMP settings as well. These serve as the defaults not only for new Ad-hoc Decoders, but any new Decoders added in the Decoders tab.



NOTE: FEC settings are not configurable in the Default VIEW Protocol Settings

4.4 Decoder Status

The Decoders Tab will display a thumbnail (if available) of the stream being routed, stream/file metadata, and stream metrics next to Decoders that have active streams or file playout. The available statistics will vary depending on whether the routed stream is using UDP or LDMP protocol in the outgoing stream. Furthermore, stream statistics only appear when logged onto the same Cloud server as the arriving stream; e.g., if the encoder is streaming to LiveDE.streambox.com then the stream statistic will only be displayed when logged in to LiveDE.streambox.com.

Metadata fields displayed include **Title**, **Network** (meaning **Network Group**, **Group**, or **DRM**), **Location**, and **Contributor** (which is also shown as **Reporter** in some Encoder Metadata menus).



Metrics displayed include current outgoing **bitrate** (Kbps), total number of **packets sent**, as well as total number of **packets resent** (most likely because they did not arrive at the Decoder). Following that is the **percentage of packets resent**, which is calculated using the previous two numbers. The current **RTT** (Round-trip-time) is displayed, along with **Average RTT** for this stream, **Max (peak) RTT** for the stream, and the **Acknowledgment Timeout (ack to)** which is set by the LDMP setting **ACK Timeout**.

While it's normal at the start of the stream to see a higher **percent of packets resent**, this statistic will reveal how well the LDMP settings are working in relation to the connection that's in use. Higher numbers indicate the packets are not being acknowledged in time to prevent a resend, either because the encoder is not waiting long enough for packets to arrive (ACK Timeout is too low) or because the network is dropping a lot of packets (i.e., poor quality or congested network). Try manually setting a ACK Timeout LDMP setting to a higher value — see the chart above.

5 Web Streaming via Streambox Cloud Service and Live Channel

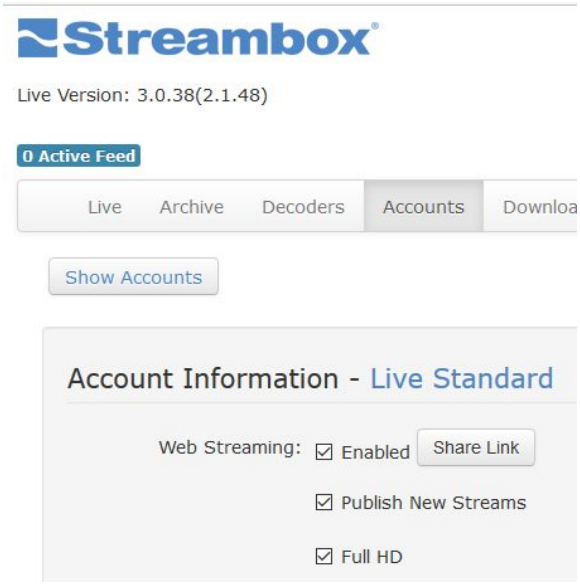
5.1 Overview of Live Channel

Streambox Cloud offers the ability to stream to a web playout through several different means. Web playout offers the ability to distribute video among the largest number of viewers on the widest array of platforms.

Among Streambox Cloud web playout services is the ***Streambox Live Channel***, where Streambox hosts a web player that can be embedded into a user's webpage using the provided embed code. Additionally, Streambox Cloud Services can route streams to YouTube, Facebook, Twitter, and other Content Distribution Networks (CDNs) that support RTMP video streams. Additional video streaming avenues are under development.

5.2 Enabling Web Streaming

In order to stream content to the web in any form, Web Streaming must be enabled in the User Account (requires Group Admin access). Use the Accounts Tab in the Advanced Mode interface to make this change. If the Live Channel page can be accessed, then it is enabled. If not, Web Streaming must be enabled through the Accounts tab of the Advanced Mode (see image below).



Enabling Web Streaming in the User Account will cause the server to create a new Decoder in the Decoders' tab, which will have the name "[Group Name] - Live Channel" where Group Name is the Group (DRM) of that user. This **Enabled** setting will affect all users in the group.

The Live Channel decoder created by this checkbox will be used for the most basic form of live streaming, "Live Channel." It can be converted to streaming to other Content Delivery Networks (CDNs) including social CDNs like YouTube and Periscope. See below for information on using those CDNs.

The second checkbox, **Publish New Streams**, enables automatic routing of an incoming stream to Live Channel, when available. This setting means that the stream automatically begins using the available data

balance, so use this setting with caution.

The third checkbox, **Full HD**, enables full-resolution HD streaming to web, rather than reduced resolution HD. The stream enables a higher bitrate for the web stream, which will likely deplete your data balance faster than if this setting is disabled.

5.3 Starting a Web Stream

Streaming to the Web through Streambox Cloud is often as simple as manually routing a stream to a Decoder. There's even some amount of automation available so that no manually routing is required for the first stream to web.

Automatic Web Streaming to Live Channel

Depending on your account level, the feature **Publish New Streams** may be enabled or disabled. See the previous section see how to change that setting.

When **Publish New Streams** is enabled, the server will automatically route new streams to the Live Channel Decoder in your account.

Manual Web Streaming to Live Channel

If you have additional Live Channel Decoders, or you don't have **Publish New Streams** checked, then you can route manually to the Live Channel by using the Route button by the incoming stream, and selecting the Live Channel Decoder's **Start** button.

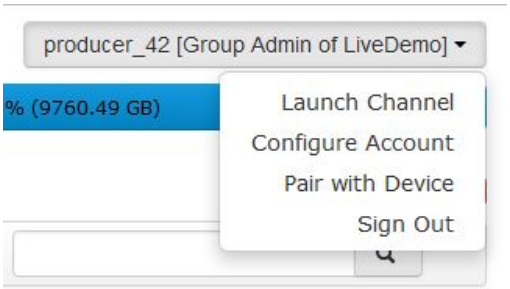
Web Stream Costs

Web streams are billed the same way other live streams and file downloads are billed. The group account is decremented at a flat price-per-megabyte, typically amounting to $0.50-$1 per gigabyte, *for each stream*. However, Web streams using Streambox Cloud's own Live Channel are replicated *per viewer*, so 10 viewers will cost 10 times as much as 1 viewer.

Streams using other CDNs, such as (but not limited to) Youtube, Facebook, and Periscope, are billed as a single stream, because the CDN bears the task of replicating the stream to multiple users. The Streambox Cloud sends only one datastream to that CDN.

5.4 Viewing the Web Stream

Once the stream is routed to the Live Channel Decoder, a Cloud user can view the channel by selecting **Launch Channel** from the User menu. This menu can be found by clicking on the Username in the upper right corner of the browser display.

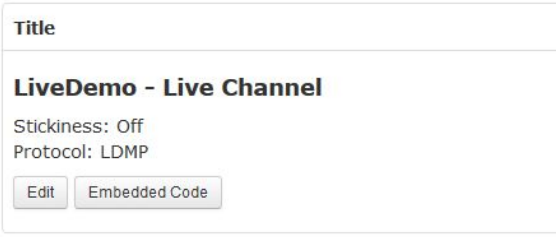


This will take the user to the Live Channel page, which includes a video player. The video should start within 25 seconds at most, often much faster.

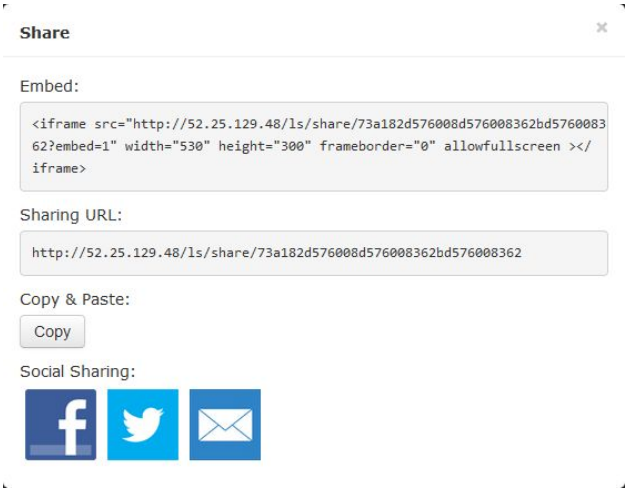
Embedding the Live Channel Player

The Live Channel web player can be embedded in other web pages, including organization web sites, some social media sites and blogs, using the available embed code provided by the Live Channel.

You can find that code by navigating to the **Decoders Tab**, locating the Live Channel Decoder, and clicking the button that reads **Embedded Code**.



The HTML code for embedding the player will be displayed, and that code can be added to a web page that allows HTML embedding to include the Live Channel's web video player directly into that web page.



Clicking the Copy button will copy the Embed code to the computer's copy/paste-buffer (e.g. "clipboard") so it can easily be pasted into an HTML editor or another web editing application.

The **Sharing URL** displayed here can be manually copied and sent to other users, who can view the Live

Channel page directly, with no server login required. See the section on Sharing Streams, below, for additional information.

5.5 Adding Live Channel Decoders

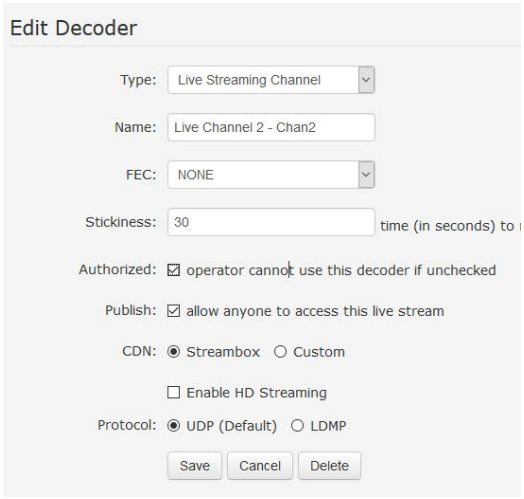
Creating Live Channel Decoders in the Cloud Service does not require the knowledge of any Decoder IP addresses, but does require alternate information required for the CDN which will be serving the web video to the viewers. Streambox Live Channels can be configured to stream to additional web players in the Launch Channel page, to Youtube, to Periscope (and thus Twitter) or to other CDNs that support RTMP livestreams.

Facebook is also supported, but that requires a different method described in the next section.

NOTE: Adding Decoders requires Group Admin or Operator account access.

For Streaming to Live Channel

By default, when Web Streaming is enabled for a Group, a new Live Channel decoder is created automatically for that Group. Additional Decoders can be created with the **Add Decoder** button found on the Decoders Tab.



Select **Live Streaming Channel** from the pull-down menu for **Type**. Add a name for the Decoder, and set **FEC** to NONE, **Stickiness** is optional: I suggest setting it to 30. Check the **Authorized** and **Publish** boxes. **CDN** should remain set to Streambox.

You may optionally **Enable HD Streaming**. It will use a higher amount of data when the original livestream is in HD resolution. If not enabled, then an HD livestream will be output to the web as an SD-Widescreen video resolution.

Set **Protocol** to UDP (Default). Since the stream is being routed to a local server, the error correction and reliability of LDMP is not necessary.

Viewing Additional Live Channels

Additional Live Channels will appear as Channel buttons near the bottom of the Live Channel page, where selected channel is white and the unselected channels are gray:

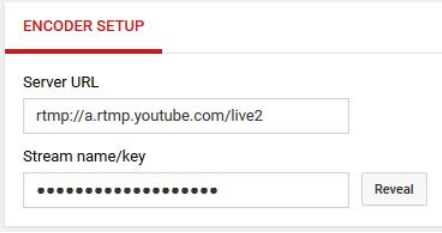


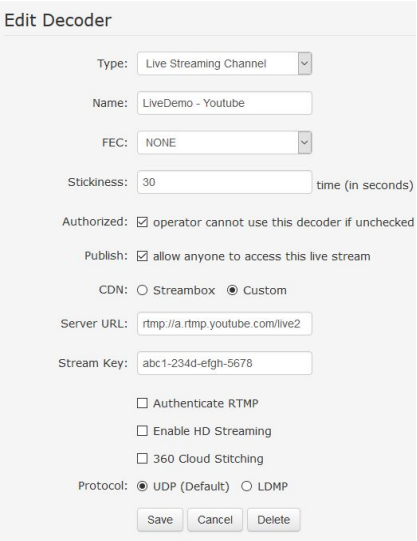
The name of the Live Channel Decoder will appear above the video player.

For Streaming to Youtube

To send a live stream to Youtube, you must configure a Live Channel Decoder in the Decoders Tab to route the stream to Youtube's **Server URL**. You will also need the YouTube channel's **Stream Key**, which is a unique identifier for that channel. To obtain that information, you'll need to log in to YouTube and navigate to this web address: **http://www.youtube.com/live_dashboard**

Scroll down to the Encoder Setup area to get the YouTube Server URL and YouTube Stream Key. Click **Reveal** to display your Stream Key so you may copy it to the Decoder Settings for your YouTube Decoder. The Stream Key consists of 16 numbers and letters.





Back in the Streambox Cloud Decoder Tab, edit the Decoder Settings as follows:

Select **Live Streaming Channel** from the pull-down menu for **Type**. Add a name for the Decoder, and set **FEC** to NONE, **Stickiness** is optional: I suggest setting it to 30. Check the **Authorized** and **Publish** boxes. Select **Custom** as the **CDN** type, and the **Server URL** and **Stream Key** fields will be displayed. Copy those settings from YouTube. You may optionally check **Enable HD Streaming**.

You may optionally **Enable HD Streaming**. It will use a higher amount of data when the original livestream is in HD resolution. If not enabled, then an HD livestream will be output to the web as an SD-Widescreen video

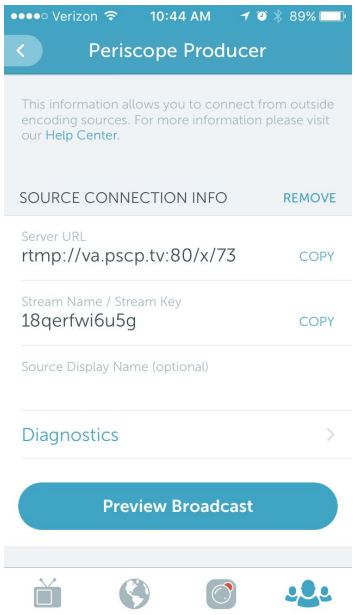
resolution.

Set **Protocol** to LDMP (Default) and set LDMP settings (particularly the **Buffer Size Packets** field) as described in the LDMP section of this Manual.

If you are streaming an unstitched 360-degree panorama image, check the **360 Cloud Stitching** checkbox to enable the Cloud-based panorama-stitching. See our 360 Support Site for details on this workflow: http://www.streamboxvr.com/

For Streaming to Periscope & Twitter

To send a live stream to Periscope, which allows posting to Twitter accounts, you must configure a Live Channel Decoder in the Decoders Tab to route the stream to Periscope's CDN address.



First, locate the CDN Address and Stream Key in the Periscope App:
Enter **Settings**, then **Periscope Producer**. Select **+Create New Source**
The App will display a **Server URL** and **Stream Name/Stream Key**

Second, set up a Live Channel Decoder for Periscope: In the Streambox Cloud Decoders Tab, click the **Add Decoder** button (or edit an existing Decoder), as follows:
Select **Live Streaming Channel** from the pull-down menu for **Type**. Add a name for the Decoder, and set **FEC** to NONE, **Stickiness** is optional: I suggest setting it to 30. Check the **Authorized** and **Publish** boxes. Select **Custom** as the **CDN** type, and the **Server URL** and **Stream Key** fields will be displayed. Copy those settings from Periscope Producer. You may optionally check **Enable HD Streaming**.

Though Periscope has required limits on the bitrate and resolution of the stream being sent to them, the Streambox Cloud software detects the Periscope CDN servers in your settings and automatically converts the stream to an appropriate bitrate, framerate, and resolution for Periscope. For that reason, increasing the quality settings of your Streambox stream to the Cloud may not necessarily increase the video quality in Periscope.

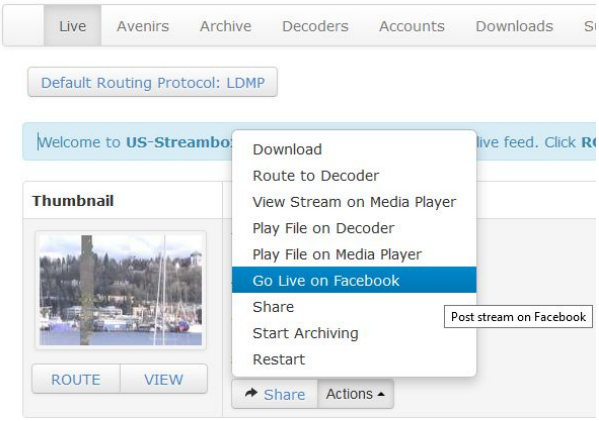
For Streaming to other CDNs (Not Facebook, YouTube, or Periscope)

In the Streambox Cloud Decoders Tab, click the **Add Decoder** button (or edit an existing Decoder), as follows: Select **Live Streaming Channel** from the pull-down menu for **Type**. Add a name for the Decoder, and set **FEC** to NONE; **Stickiness** is optional: I suggest setting it to 30. Check the **Authorized** and **Publish** boxes. Select **Custom** as the **CDN** type, and the **Server URL** and **Stream Key** fields will be displayed. Enter those settings given by your CDN; the Server URL will likely start with **rtmp://** and the Stream Key will be a random series of digits. You may optionally check **Enable HD Streaming**, if your CDN allows higher bitrates and full HD video resolution.

5.6 Streaming on Facebook

Streambox Cloud offers dedicated functionality for easily routing your live video streams to an existing Facebook Account.

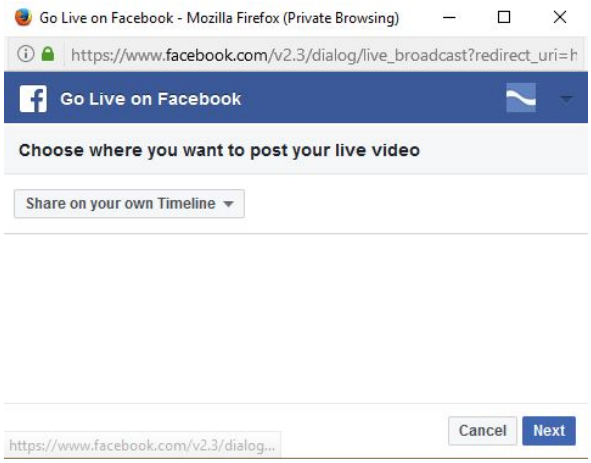
In the Live Tab of the Advanced Menu, open the Actions menu next to your incoming live stream and select **Go Live on Facebook**.



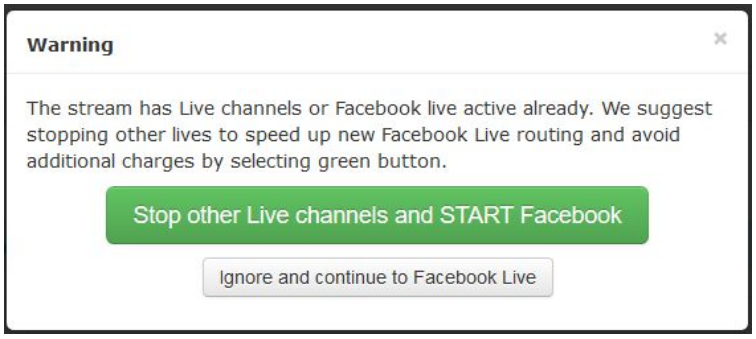
A pop-up browser window will appear to allow you to log in to Facebook. If you are already logged in to Facebook, it will skip the log-in screen and proceed to the Timeline screen.

NOTE: if you do not see the pop-up, set your browser settings to allow pop-up windows from live.streambox.com. You may also get an indication that a pop-up was blocked by your browser, and you can allow it that way. If the pop-up contains an error message, consult the troubleshooting guide at the end of this manual.

In the Timeline screen that follows the login, select the available Timeline in which you'd like to post your live stream, and click Next.

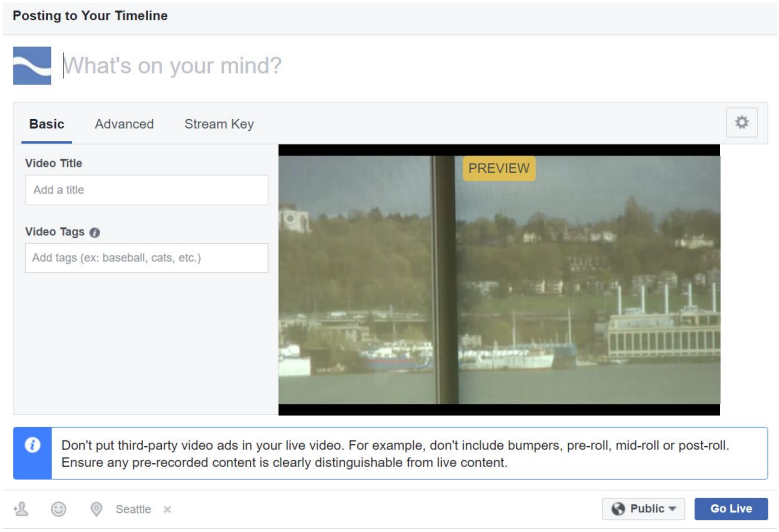


At this point, you may see the below warning message:

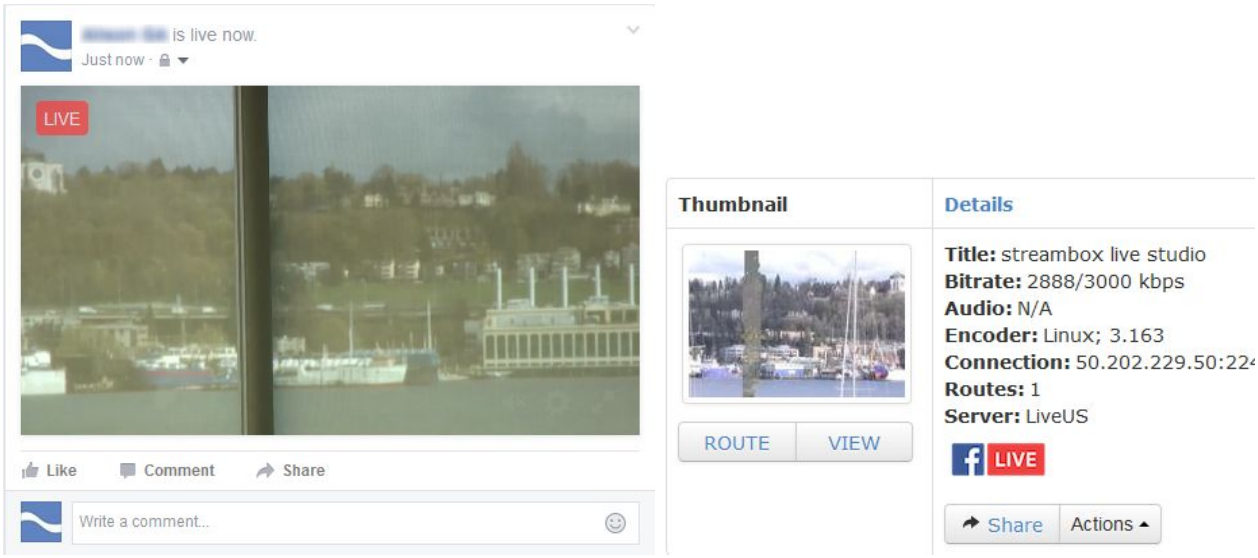


When using this simplified Facebook live stream workflow, a server condition requires that Facebook disconnect other Live Channels currently in use with the same stream before starting Facebook. For this reason, it is recommended that you start Facebook before starting other streams such as Periscope, Youtube, or the Streambox Live Channel.

In the next step, it's time to set up the post to your Timeline. Here is an opportunity to add text to your post, such as a caption for the video, as well as Video Title and Tags. A preview area will display the incoming stream.



When you are satisfied with your post, set the privacy settings on the post (next to the **Go Live** button), and click **Go Live** for the post to appear on your designated feed.



On the Streambox Cloud Live tab, the Facebook Live Stream icon will appear, as above.

Stopping the Facebook Stream

To stop the stream, return to the Actions menu and select “Stop Facebook Live.” This will terminate the stream to Facebook, but will not affect any other outgoing streams to Media Players, Decoders, or other web streams.

Facebook Live Channel setup

Facebook also provides a Streaming Server URL and Streaming Key on the “Posting to your Timeline” screen; select the “Stream Key” tab to reveal that. You can use that information to create a Live Channel Decoder with your Facebook information, if that’s your preferred workflow. See Section 5.5 for details on that process.

5.7 Sharing Live Channel Streams

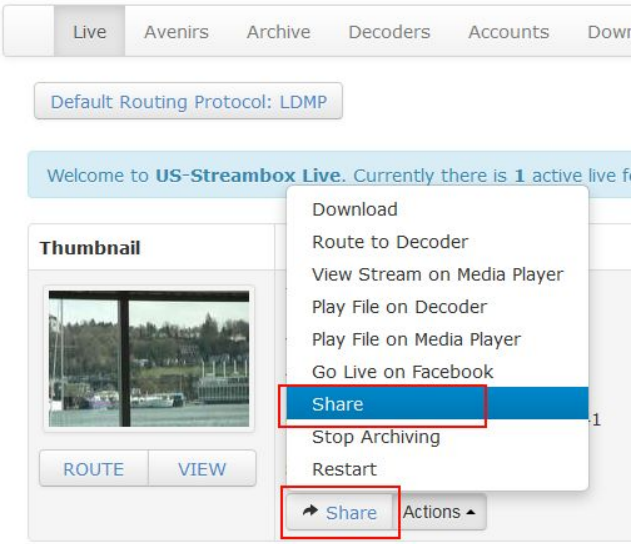
Streams routed to Streambox's Live Channel include a specific web link for sharing via social media or other electronic communication. Streambox Cloud offers several buttons for easily sharing that link over Facebook, Twitter, Email, or copying the link to the clipboard so you can paste it into any other communication. Additionally, files can be shared using a link as well.

Live Stream Sharing

There are three places from which you can access the live stream sharing features:

- Live Tab Share button
- Live Tab Action Menu
- File Information Action Menu

Locate the "Share" item in any of those places, and select it for a pop-up menu of sharing options:





The first two options, Facebook and Twitter, will require that you log in to those services; if you have already logged in to them in the same browser, you will be taken directly to the place to post on Facebook or send a Tweet.

The third option opens an email using the system default email client. The fourth link will copy a shareable link to the system clipboard.

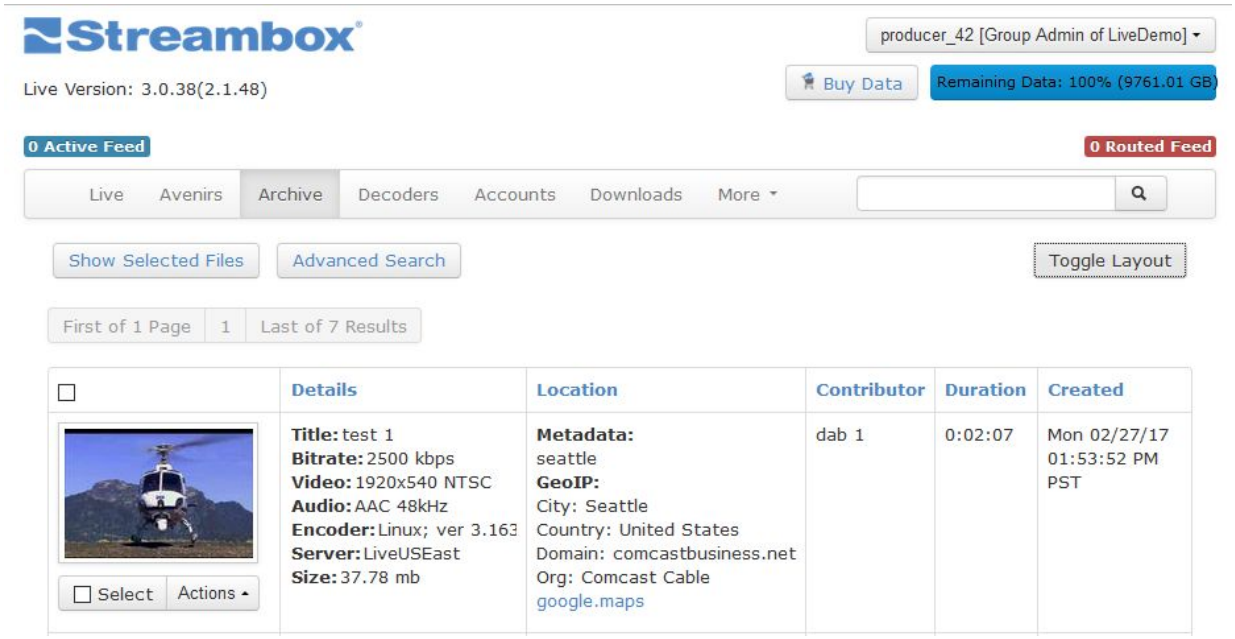
Security and Privacy

When using Streambox Live Channel to stream your content, no security is offered as the stream must be public to be embedded into your web page. However, the URL of the web stream is a complex, randomly generated link, so protecting access to the link by sharing it only with people you trust will be adequate security for most purposes.

6 File Management

All incoming live streams are recorded as files, by default, and those can be found here.

The Archive tab lists files that have been recorded by or uploaded to the Streambox Cloud.



The files are listed in most recent first. Additionally, the files listed can be filtered for easy searching of file metadata by using the search bar.

Current live streams are indicated by the **REC** icon: REC Note that the REC icon does not disappear if recording is stopped or disabled.

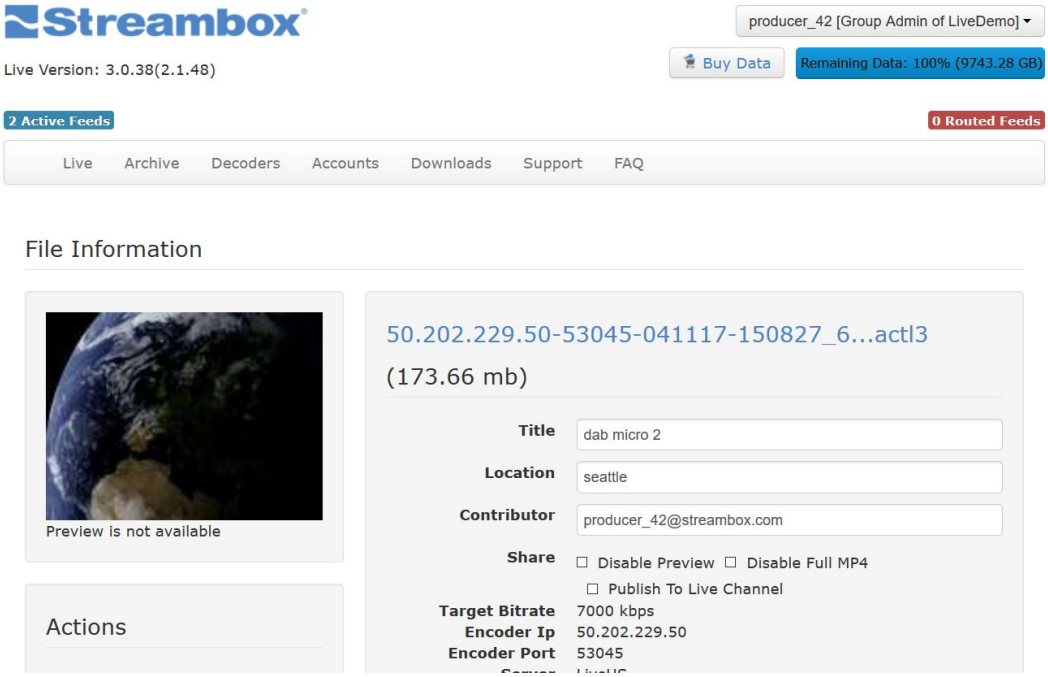
Each file is represented by a thumbnail image taken from the start of the file. Next to the thumbnail, the file's video qualities are shown, as well as the metadata sent with each file, including **Title**, **Contributor**, **Group** (another authorization field), **Duration** (in HH:MM:SS format) and time and date the file was **Created**.

Not all file types will contain metadata. Likewise any ACT-L3 files sent with empty metadata fields will have those fields filled in with "N/A."

NOTE: File Recording can be disabled for your Group, upon request to Streambox Support, whose contact information can be found at the end of this manual.

File Information

Click on the thumbnail of the file for its File Information page.



On this page you can view the qualities of the live stream including video settings, bitrate, video standard, length and time of stream and current file size. Additionally, three fields for metadata, Title, Location, and Contributor, are shown. You can click on the filename (highlighted in blue at the top) to save the video to your hard drive.

File Preview

To preview a video file on you , you can mouse-over the thumbnail and press the Play button inside the player, for a brief preview of the video content, 1000 frames in length. To see more, first open the Streambox Media Player on the local computer, and then click the **Play file on Media Player** link. The file will play in the Streambox Media Player from the beginning, even if the file is still being recorded.

To preview a video file on a Decoder that's been entered into the Decoders tab of the Server, click the **Play File on Decoder** link to select a Decoder. The Decoder selection process is covered in section 3.4. The file will play from the beginning of the recording.

To erase this file from the Server, click **Delete This File** under the Actions menu.

NOTE: Erasing a file is permanent and cannot be undone.

6.1 File Playout and Time Shift (DVR)

Streambox Cloud Server's automatic recording of incoming live streams brings with it the additional benefit of time-shifting the playout of the live stream. Rather than have a Decoder receive the stream within seconds of it being sent, a live stream can be viewed at a later time using the File Playout and Time Shift features of the Server. This can be used with a live stream that is currently streaming to the Server, or a stream that is no longer active, but the recording of which is stored in the file archive of the Cloud Server.

File Playout

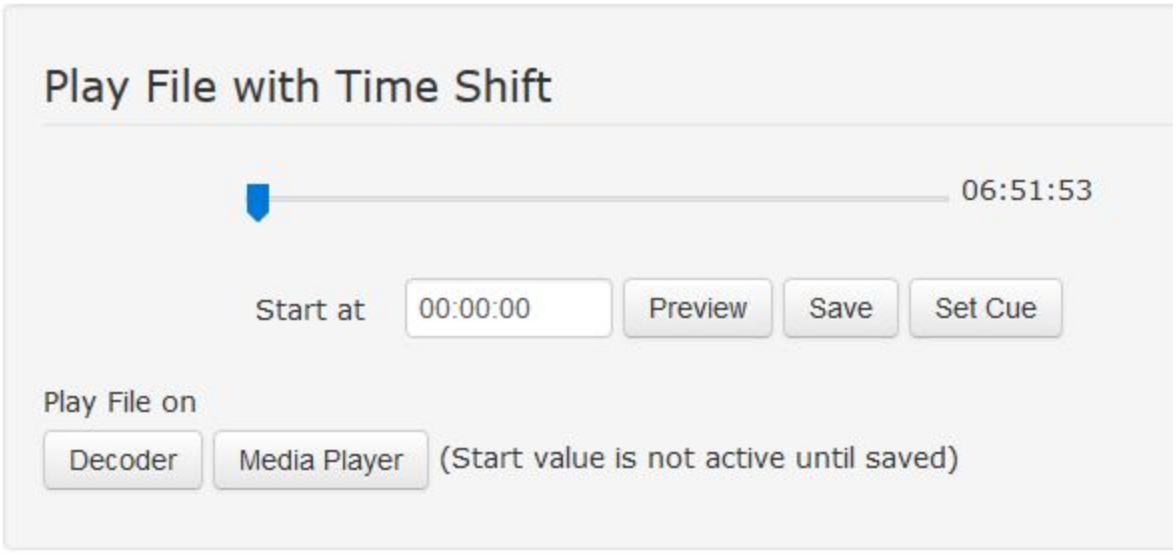
As noted in the previous section, the Actions menu has the options to **Play File on Decoder** or **Play File on Media Player**. Both of these actions have the effect of playing the stored archive file, from its beginning, as an HTTP filestream to the Decoder or Media Player.

Select **Play File on Decoder** and then select a Decoder from the list, and click the **Play** button for that Decoder. The playout will begin within several seconds.

NOTE: File playout, whether from a current live stream or an archived file, is an HTTP file transfer, which requires network access through Port 80 TCP. As this is the same port used by common web traffic, the port is generally open in firewalls, but the firewall at a receiving Decoder location may require port forwarding to be configured, just as live streams requiring UDP Port 1770.

Time Shift

It may be more desireable to start the file playout from a specific time within the file. To do this, begin by clicking on the file's thumbnail under the Archive Tab, which will open the File Information page for the recorded file. Scroll to the very bottom of the screen for the **Play File with Time Shift** section:



To play a file from a different point besides the beginning, enter a time into the **Start at** field. You can enter some number of seconds (integers only), or you can enter hours, minutes, and seconds in the following format: **HH:MM:SS**. The time is saved in the user's account, so other people signing in with the same username will see the time saved.

After entering the time, click the **Save** button to set the time into the system. Alternately, you can click the **Preview** button to pull a time-shifted video to your Streambox Media Player, which must be opened on the same machine running the web browser.

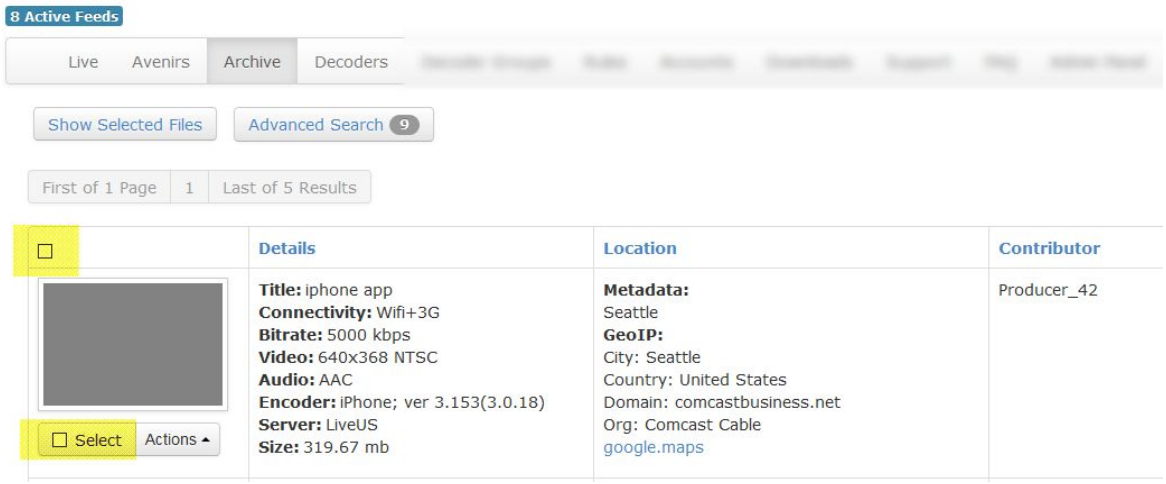
The **Set Cue** button only appears while the live stream is active. Clicking this button will instantly set the **Start at** time to the current time. The user should click the **Set Cue** button at the instant an important event takes place, so that viewers of the time-shifted video will start their playout at that point. For example, click **Set Cue** at the start of a worship-leader's message, or the resumption of play in a sports match.

NOTE: It is advisable to manually subtract 10 seconds from the cue time to give an opportunity for the screen output to completely clear of stream-start artifacts (regions of gray on the screen, which are normal at the start of a file playout or stream) before the cued event begins.

After saving a time for the time-shift, you can make a selection from the **Play File on** buttons. Select **Decoder** to choose a Decoder from your stored Decoders list, or **Media Player** to play the file on the Streambox Media Player that's already running on the same computer as the web browser that you're using.

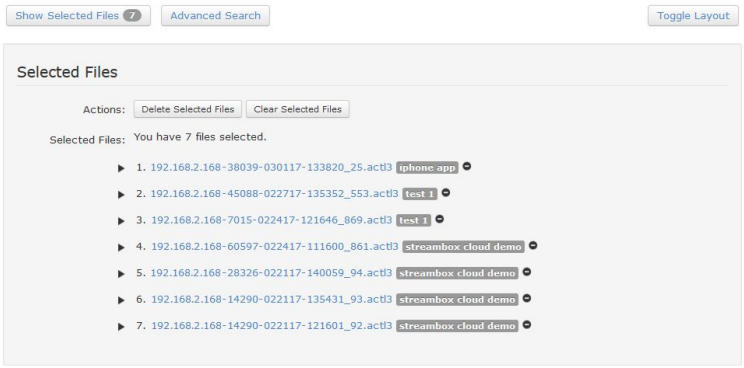
NOTE: Due to a software limitation, the file must amass a minimum of 30 megabytes of stored data for successful time-shifting to occur.

Selecting and Deleting Multiple Files



To select multiple files for deletion, check the small checkbox, marked **Select,** next to each listed file, or click the checkbox at the top of the list to select all files on the page.

Click the **Show Selected Files** button to view a subset of the files:



To the right of each file, the file's metadata **Title** is shown, along with a (-) button to delete that file.

The files can be deleted as a group using the **Delete Selected Files** button, or the selections can be cleared from all files on the list using the **Clear Selected Files** button.

Advanced Search

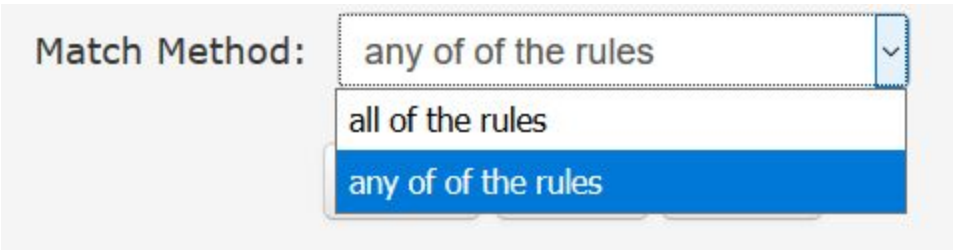
The Advanced Search button will open a powerful rules-based tool for locating specific files among your archives. This menu allows you to create filters that search through the various metadata of each file, searching both the text metadata added by users as well as metadata related to the file itself and the original stream.

In the first pull-down form , select an item of metadata or file properties in which you'd like to filter. Options include:

- Title - text metadata set by user, also called "Slug" on some encoder products
- DNG Name (not commonly used - MAC encoder only)
- Contributor - text metadata set by user; also called "Reporter"
- Location - text metadata set by user.
- Connectivity - text metadata set by user (Windows and Mac OSX only)
- Device - Operating system on which Encoder is running: same as Platform: WIN32, MAC, Linux, Android, iPhone
- Filename - based on an origin IP address of the stream
- File Size (byte) - Search for files that are greater or less than a particular byte count. (use numerals only, no commas or periods) Here are a couple of file sizes that may be useful.
    - 1 megabyte = 1048576 (== 1024 x 1024)
    - 1 gigabyte = 1073741824 (= 1048576 x 1024)

In the second pull-down, select the method of including or excluding results. For most fields, these options are available. For some fields, fewer options are available, based on what makes sense for that context.

- Contains
- Does not contain
- Is
- Is not
- Begins with



- Ends with
- Is greater than
- Is less than

In the third field, enter the text or number that you are searching to include or exclude from your search.

You can also add additional filter lines to the Advanced Search. Additional lines will filter using either AND or OR logic, but not a mix of both. Use the **Match Method** selection to which logical connection will apply to all of the fields:

- All of the rules == AND
- Any of the rules (default) == OR

7 Global Video Transport for Live Streams

Global Video Transport is an add-on for Streambox Cloud users with Live Enterprise or Live Broadcast accounts, which allows those users to utilize multiple Streambox Cloud Servers in a single stream to make use of the high-speed connections between the Cloud servers.

7.1 Advantages

When the sender and viewer/receiver of videos are on different continents, or across North America from one another, normally one of those parties will be connected to a more distant server that they might normally use, in order to complete the stream connection. Either the sender selects a Cloud Server nearest the receiver, or the sender connects to the closest Cloud Server to themselves and the receiver is *de facto* connected to the Cloud Server closest to the sender, but not themselves.

With the settings described below, it's possible to send your stream across the globe while both the stream senders and viewers are both accessing the closest Streambox Cloud server to themselves, minimizing overall latency. Global Transport settings will enable the sender to send to their local Cloud Server, and forward the stream to the Cloud Server nearest the receiver, who then connects to the latter server. The result is lower packet loss thanks to the near-dedicated transport between Cloud Servers, and shorter first-mile/last-mile transport between the Cloud Server and the sender and receiver users.

7.2 Setup

In the Advanced menu of the Streambox Cloud Server, navigate to the Decoders tab. The Decoders tab on the Cloud Server Web Interface displays all available Decoders or Media Players that have been added by users. Follow the following procedure to add a Decoder entry for the *Cloud Server closest to the user who will be receiving the stream.*

- Click the **Add Decoder** button.
- Set the Type to **Decoder (default)**
- Set the name to the name of the Streambox Cloud Server closest to the receiving party.
- Set the IP to the numerical IP address of the Server. Here is a link to the current list of Cloud Server IP addresses.
- Set the port to **1770**
- Set Protocol to **UDP** (LDMP will also work but may require additional configuration)

7.3 Routing the Stream

Start the stream to the closest live server to the send. Once that stream appears in your list of incoming streams, click **Route** and select the Decoder you created for the more distant Cloud Server that's closer to the stream's ultimate destination. Once that stream is underway (within 30 seconds), a new stream will appear under the Live tab in the Cloud Server menu.

The two streams will have identical metadata, but one displays that it's being sent to the server closest to the sender, and another displays that it's sending to the server closest to the stream's receiving user. Additionally,

the two streams will show different stream durations; the one with the shorter duration will be the one received by the distant Server. That second stream, going to the destination server, should be routed to the Decoder or Media Player of the receiving user.

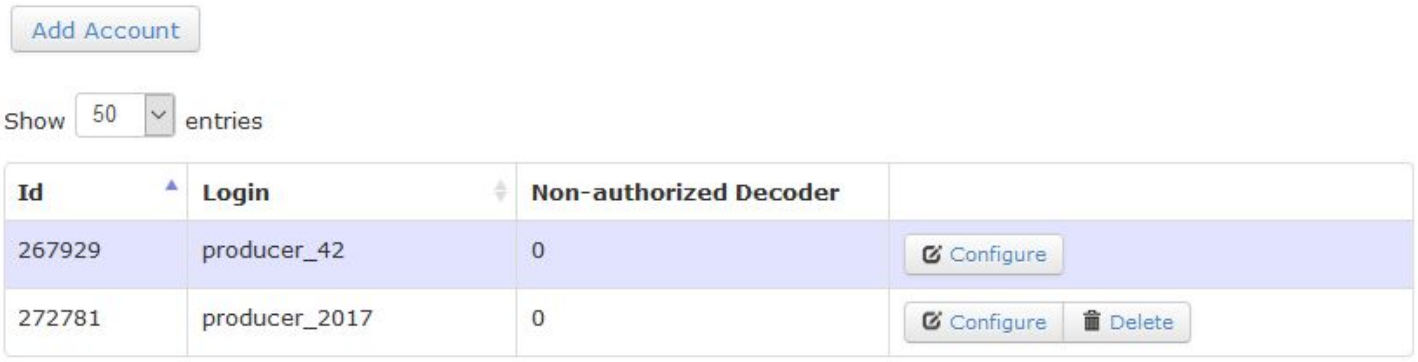
8 Sending Files to the Server

The Streambox Cloud Services can receive files as well as Live streams. Currently only Streambox Avenir and Streambox ME Pro can send files to the Streambox Cloud. Files are stored in the Cloud server and are viewable along with the recorded streams in the Archive Tab. Avenir users should set the Cloud server's IP address in the "Store and Forward" settings. Streambox ME Pro users should set their Decoder settings to point to the Cloud server before attempting to send the file.

Like the recorded Live streams, files recorded using the ACT-L3 codec can be played to a Media Player, to a Decoder, downloaded, or deleted. *See section **6: File Management** for more information.*

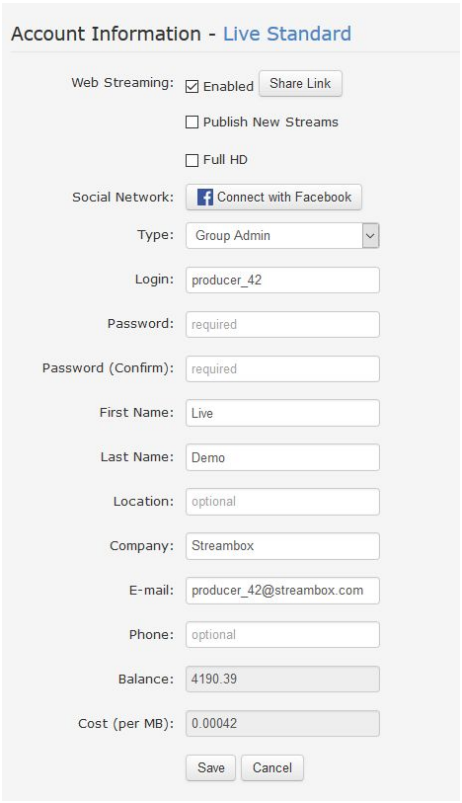
9 User Accounts and Billing

Use the Accounts tab of the Advanced Menu to create or edit accounts. Each different user of the Streambox Cloud Services may have an account, or one can create accounts to be used by a pool of people with identical access needs. Giving each user their own account will help with tracking the activity of individual users if that is desired.



The accounts tab may direct you directly to a user detail page, instead of the above list, if only one user is present in the Group.

Adding or Editing a User and Group



Select **Configure** next to a user's name in the userlist to configure that user. To add a new user to the Streambox Cloud Service, click the **Add Account** button at the top of the list on the Accounts Tab. You must be a Group Admin to perform this function.

NOTE: Not every Group account type nor User account type allows account creation.

Enter or edit the required fields for each user, including Name, Username (Login), Password. Additional fields are optional, including First and Last Name, Company, email address, and Phone number.

Set the new user's Type based on the needs of the user. The different levels of access are detailed in **Appendix B: Cloud Server User Types and their Access**.

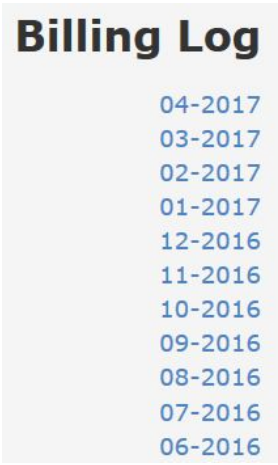
Web Streaming settings apply to all users in the group.
Click the **Enabled** checkbox to allow web streaming at all. Click the **Publish New Streams** checkbox to set the account to automatically stream an incoming stream to the available Live Channel Decoder. The Live Channel Decoder must be available before the stream is sent to the Cloud server. Click the **Full HD** checkbox to enable

web streams with full HD quality (at a higher bitrate, and thus higher cost). If unchecked, the web output stream will have SD widescreen resolution and reduced bitrate even if the original Encoder stream is HD.

Click **Save** to save the user, or **Cancel** to remove changes.

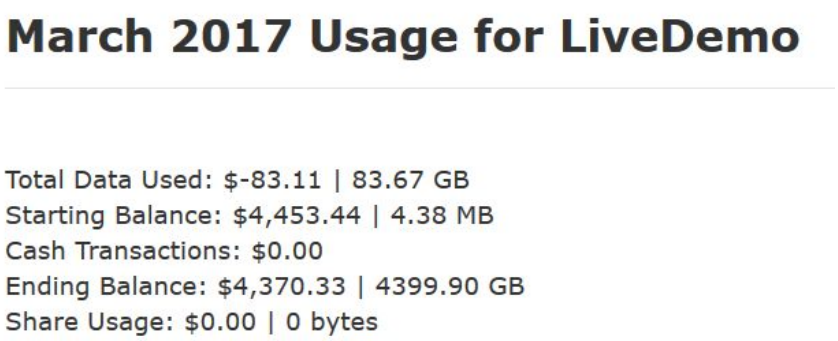
9.1 Billing

The right-hand side of the Account detail screen contains links to the monthly billing log for your group account.



Click a link to view the billing log containing all transactions for your Group account. Each routed file, file download, shared file, web video, and any changes to billing (such as a credit following a payment or other balance change) will appear in the report.

In addition, a summary of data usage and balance used appears at the top of the report:



Appendix A: Cloud Server Addresses

Name	IP Address	Description
LiveUS.streambox.com	52.25.129.48	USA (Oregon)
LiveUSEast.streambox.com	54.83.19.155	USA (Northern Virginia)
LiveAU.streambox.com	52.62.2.246	Asia Pacific (Sydney)
LiveDE.streambox.com	54.93.179.19	Europe (Frankfurt)
LiveEU.streambox.com	54.247.100.52	Europe (Ireland)
LiveJP.streambox.com	52.69.71.156	Asia Pacific (Tokyo)
LiveSA.streambox.com	54.233.86.10	South America (Sao Paulo)
LiveSG.streambox.com	52.76.243.157	Asia Pacific (Singapore)
LiveIN.streambox.com	52.66.83.26	India (Mumbai)

These addresses will be kept as current as possible in the manual, but the most up-to-date list can be found in the Streambox Support area at http://www.streambox.com/support/ in the Streambox Cloud section.

NOTE: It is strongly recommended that, for best function, you connect your browser to the Domain Name of either Live.streambox.com or an individual server using its name, such as LiveSG.streambox.com, rather than using the IP Address.

Appendix B: Cloud Server User Types and their Access

Feature access	Group Admin	Operator	Contributor
List all current live streams	+	+	#
List all files	+	+	#
Edit file metadata	+	+	
Create/Edit Decoders	+	+	
Edit Default VIEW Protocol Settings	+	+	+
Create/Edit IFB Server	+	+	
Create/Edit User Accounts	+	#	
View User Accounts	+	#	#
ACTIONS MENU ITEMS			
Route stream to Decoder	+	+	
View stream on Media Player	+	+	
Download files	+	+	
Play file on Decoder	+	+	
Play file on Media Player	+	+	
Stop/Start archiving of life stream	+	+	
Restart Stream	+		
Create MP4/MOV	+	+	
Delete files	+	+	

+ Access only to items owned by same group

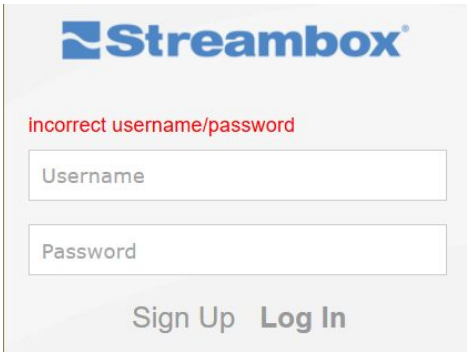
Access only to items owned by same user

Appendix C: Troubleshooting

C.1 Unable to log in to Streambox Cloud Server

When logging in to Streambox Cloud Server, there are two major reasons for login failure: wrong username/password, and the time is set wrong on the user's computer.

Both login failures appear the same. The user will be taken a blank login page at an address that looks like this:
http://live.streambox.com/ls/login.php?auth1=incorrect%20username/password
This is how the mobile site shows this error message:



Typos

Check that your username and password are spelled correctly, and that your Caps Lock key is not enabled unexpectedly. Typographical errors are the most common reasons for login failure.

Time and Timezone

Due to the security constraints of the login process, the computer running the web browser that's logging in to the Cloud server must have the time and timezone set to within 5 minutes of the current time on the server. Be sure to check the hours:minutes as well as the meridian (AM or PM), and check both the Timezone and Daylight Saving settings. Best practice is to set the computer running the web browser to "Network Time" or the equivalent.

Reset Password

If resetting your password is needed, try the Password Reset option on the login screen:



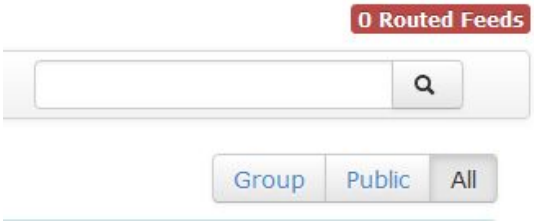
Alternately, contact a Group Admin user for your Group/Company and have them reset your password. If neither option is available, contact Streambox Support, and they can reset the password manually.

C.2 Incoming Stream Problems

Stream not visible in Live Tab

The most common reason a stream sent to the Streambox Cloud Server is not appearing in the Live tab is that the Metadata on the stream is disabled or blank. Access the Encoder's **Metadata** menu to configure metadata. It is most critical that the metadata field **Group**, also known as **DRM** or **Network1**, contains the accounts Group name.

Another reason streams may be invisible is that they are filtered out. In the upper right corner of the Live tab, clear out as the search field and click the search button (magnifying glass).



C.3 Outgoing Stream Problems

Decoder Locked

When routing a stream or file to a Decoder, the Server's Virtual Decoder will "lock" to the stream so that other streams cannot be directed to that Decoder, which would interfere with the first stream. Once an incoming live stream stops coming in, the Decoder may remain "locked" according to its **Stickiness** setting. For the duration of the Stickiness setting (in sections), the Decoder will not be available for receiving other streams, because it is waiting for the previous stream to resume. When the Stickiness period runs out, the Decoder will become available.

Unable to pull to Media Player

When trying to pull a video to the Media Player or Decoder using the View button, be sure the Media Player is already open. Additionally, if the player was already receiving a stream, try closing the player for 15-30 seconds, then reopening it. That will ensure that previous streams will time out and the player is available for your next stream.

C.4 Poor Stream Quality

If the stream to the Decoder or Media Player is stuttery, out of audio/video sync, or has colorful smears across the image from a live stream, it's experiencing packet loss. That is, the Decoder/Player is not receiving all that is being sent by the Server.

NOTE: If the visual and audio artifacts are in the file playout, however, it's likely that the problem is in the stream from the Encoder to Server. *Check the Encoder network/LDMP settings to address that issue.*

Most commonly the problem can be resolved by configuring the LDMP settings, either in the **Default VIEW Protocol Settings** or in the **Edit Decoder** screen. Start by checking the **Buffer Size Packets** Field. The number after the semicolon (;) should be greater, by at least 20%, than the bitrate of the stream you have routed.

Check the **ACK Timeout**. Consider setting a fixed value instead of permitting the automatic setting, and you can diagnostically change the value to anything between 150 and 1000 to see if there is any improvement. Connections with a wider range of latency variation (which is common for very high traffic connections with a high number of users, such as at hotels) should have a higher value here.

After making changes to the LDMP settings, it will be necessary to stop the outgoing stream and start it anew using the **Route** or **View** buttons.

C.5 Stopped Streams Remaining in Live Tab ("Ghost Streams")

If a stream remains in the Live Tab for more than a minute after the Encoder has stopped sending, Server may have failed to clear the stream from the display, resulting in a "Ghost Stream." To clear a ghost stream, select **Restart** from the Actions Menu, and that will force the Server to disengage from the stream. Only System Admins and Group Admins can access the Restart option.

C.6 File Playout / Time Shift Failures

File playout works by the Cloud Server passing a file-download URL to the Decoder/Media Player, and feeds that file out at a transfer rate that's the same or greater than the bitrate of the recorded video. The file download is an HTTP file transfer and requires two-way communication through **Port 80 TCP**, which is the standard web port.

Playout fails to start

Most commonly, playout fails because of a network block on TCP 80, the web port. If "Play File on Decoder" fails to work, access the Server from a browser within the Decoder (or a browser on the same machine as the media player), if possible, and select "Play File on Media Player." This creates a "pull" request from the Server to send the file, and most firewalls allow such a request even if they block the normal "push" request.

Another common playout failure occurs when the user accesses the Cloud Server web interface using a browser on the Server itself, using the web address http://localhost/ls or http://127.0.0.1/ls. Though these

will work for most functions, accessing these URLs will cause file playouts to fail because they cause the file-URL passed to the Decoder to also use "localhost" or "127.0.0.1," which causes the Decoder to look for the file on itself, rather than the Server. If using the web browser on the Cloud Server, and playing files to remote machines, be sure to use a web address for the Server that the Decoder can use as well. These include public IP addresses or fully-qualified domain names (if the Decoder is accessing the Server from across the internet), or private IP address (if the Decoder is accessing through LAN or VLAN).

Error Message: "Please start Streambox Media Player"

This message usually happens for one of two reasons:

- Media Player isn't open: When using the Action-menu items **Play File on Media Player** or **View on Media Player**, or just the **View** button, the Media Player must be running on the same machine as the web browser at that time.
- User is connected to Cloud Server using secure-http, HTTPS: if the user has connected to the Cloud server using HTTPS rather than HTTP, the SMP will fail to handle the command from the browser to pull the stream. This is a bug that will be fixed in a future release of Streambox Media Player. Change your URL in your browser from **https**://live.streambox.com to **http**://live.streambox.com (change "live" to the servername if needed).

Error Message when playing a file/time-shifting: "The file is on a different server that is not currently accessible."

This error occurs when the user is connected to Cloud Server using secure-http, HTTPS. This is a bug that will be fixed in a future release of Streambox Media Player. Change your URL in your browser from **https**://live.streambox.com to **http**://live.streambox.com (change "live" to the servername if needed), and try to play the file again.

Playout stops unexpectedly

This occurs when the server reaches the end of the file. If the stream is still active and you are playing a time-shifted file, the Cloud Server may require an update to fix this issue; it is failing to check that additional stream data is still incoming. Contact Streambox Support.

Playout begins from beginning of the file, rather than from set point.

This usually occurs if playing a file too soon, or setting the playout point too late. When setting a time-point for the file to begin playout, the file must be at least 30MB in size. If there is not that much file yet recorded, the time-shift may start playout at the beginning. 30MB is about 4 minutes if the bitrate is 1Mbps, or about 25 seconds if the bitrate is 10Mbps.

The file may also play out from the beginning if you set a cue-time greater than the length of the file.

File playout starts seconds after intended Cue point

When using the **Set Cue** button, the time that's captured may be slightly after the intended cue point. Subtract several seconds from the time displayed, and click **Save**, and then start the playout again.

File plays with noise/gray regions on screen at the start

This is normal for both file and live stream playout. The file or stream is beginning to appear but the complete screen is not updated at the outset; only after 5-10 seconds (when using default settings for the Encoder's keyframe frequency). The encoder settings can send keyframes (meaning full screen refreshes) more frequently to limit this problem, but it's recommended you start the playout 5-10 seconds sooner.

C.8 Web Stream Problems

Web Playout Error Messages

Many if not most problems with web stream arise due to a security conflict that can arise when the user is viewing the Cloud Server in a browser that's pointed to its numerical IP address instead of the domain name. For example: Domain name: ***liveus.streambox.com*** will work in some cases where ***52.25.129.48*** will not.

Here are some examples of this issue:

- Error message on Live Channel: "**We are having problems with playback.**"
- Error message in Facebook Pop-up: "**Can't Load URL: The domain of this URL isn't included in the apps domains. [etc.]**"

Additionally, if you are connected to the Cloud Server using HTTPS (that is, you are connected to https://live.streambox.com), try using HTTP (such as http://live.streambox.com).

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