



# Cloud

## USER GUIDE

### NDI®



**VERSION 10**  
January, 2024

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# Welcome to BirdDog Cloud

## Why BirdDog Cloud?

NDI® technology has revolutionized the distribution of video. The highly efficient NDI® codec allows multiple video systems to identify and communicate with one another over IP, allowing transmission and receiving of high-quality, low-latency, frame-accurate video and audio in real time.

However, NDI® has historically been limited to high bandwidth Local Area Network (LAN) operation. Using NDI® on a Wide Area Network (WAN) is difficult because:

- NDI® was specifically designed for high bandwidth LAN operation.
- NDI® is not optimised for low latency, long distance video use.
- High definition video requires a 100Mbit/sec data rate which is challenging for typical WAN connections.
- NDI® sources are hard to share directly over a WAN as the announcement services are designed to be local only

Oftentimes in productions, on top of NDI based sources, there are additional video and audio sources present, from DANTE audio through to SDI video. BirdDog Cloud has you covered on all bases to collaborate or teleport your production across the planet securely over the internet. Supporting native SDI inputs and Outputs via Blackmagic cards, and Dante Audio connectivity (Separate Dante enablement license required).

BirdDog Cloud is your gateway to the world. It turns NDI® and other sources in different WANs into local sources over the internet. Cloud makes it easy to direct video, audio and control data to wherever it is needed.

## Advanced transport Backbone

The heart of BirdDog Cloud is the transport engine, like the swiss army knife of media movement, it deeply embeds in protocols like SRT and its native BirdDog Cloud Connect, which both leverage bi-directional UDP traffic to optimize video streaming over public networks. In addition to the video data that is sent from a content source device to a destination, there is a constant exchange of metadata between the two endpoints to maintain consistent video quality.

Advantages of SRT include:

- Configurable settings allows for up to 15-20% packet loss while maintaining stream quality.
- Configurable latency.
- Configurable encryption up to 256 bit.

Advantages of Cloud Connect include:

- Extremely low latency (down to 1 frame, network dependent)
- Platform independent - receive on any internet connected smart device including Windows, Mac, iOS, Android and more
- Highly secure end-to-end encryption
- No need for network firewall exceptions



## BirdDog Cloud Overview

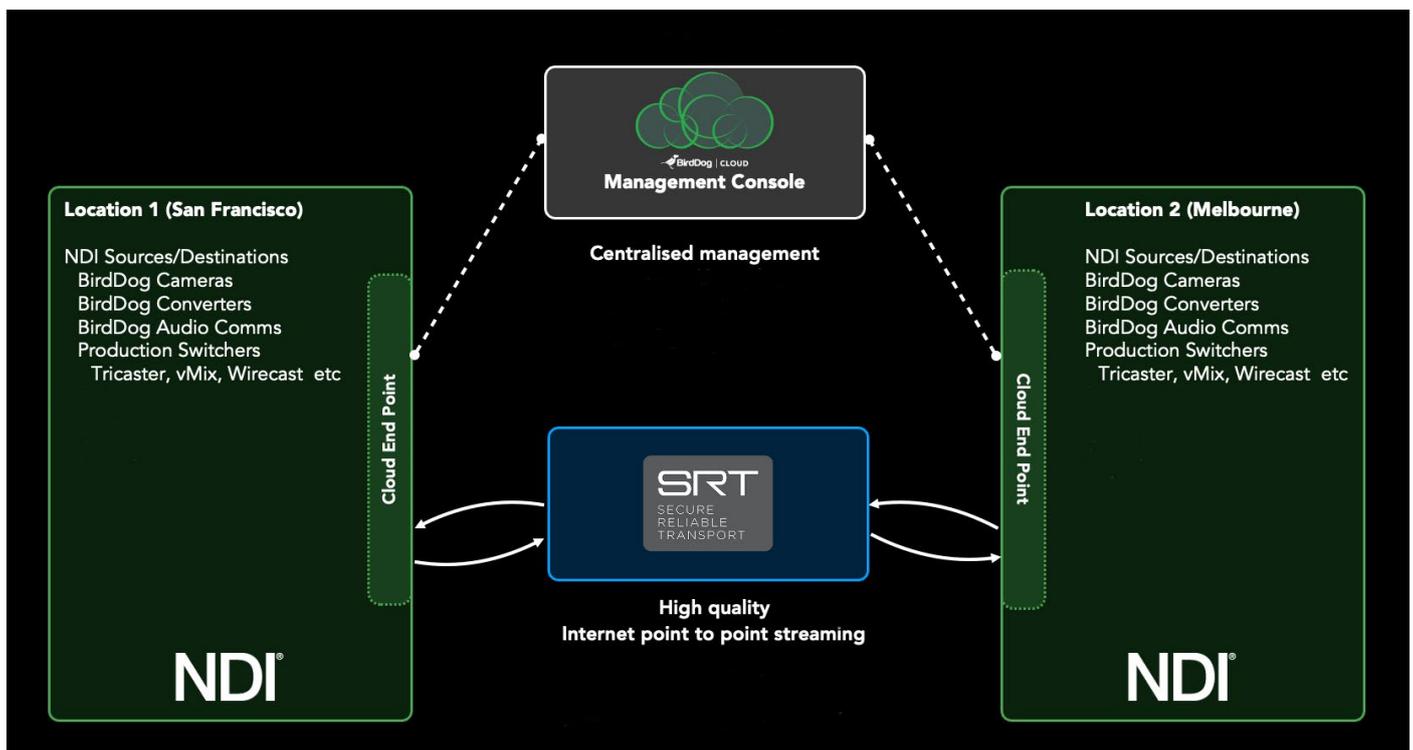
**BirdDog Cloud** is the overall management centre for video distribution. Video is delivered via either an SRT point-to-point connection, or via the Cloud Connect platform-independent streaming protocol. Cloud keeps your media safe by never storing or decrypting your content.

The Cloud Web Console makes it easy to direct video, audio and control data to wherever it is needed. Operation can be summarised in just a few steps:

1. Select your desired source Endpoint. An Endpoint is a computer or device with access to local NDI® sources or devices. The Cloud Web console displays all available BirdDog Cloud Endpoints in your organisation. If an Endpoint is active and connected to the internet, it will be displayed.
2. Choose whether you want an Incoming connection TO a selected Endpoint, or an Outgoing connection FROM an Endpoint.
3. Choose the desired transport medium depending on your requirement. In addition to SRT, output options include:
  - Cloud Connect – which is a suite of applications for display on a computer monitor, tablet or TV.
  - RTMP – for transmission to CDNs such as Youtube Live and Facebook Live.
4. Choose your target Endpoint and configure according your requirements.

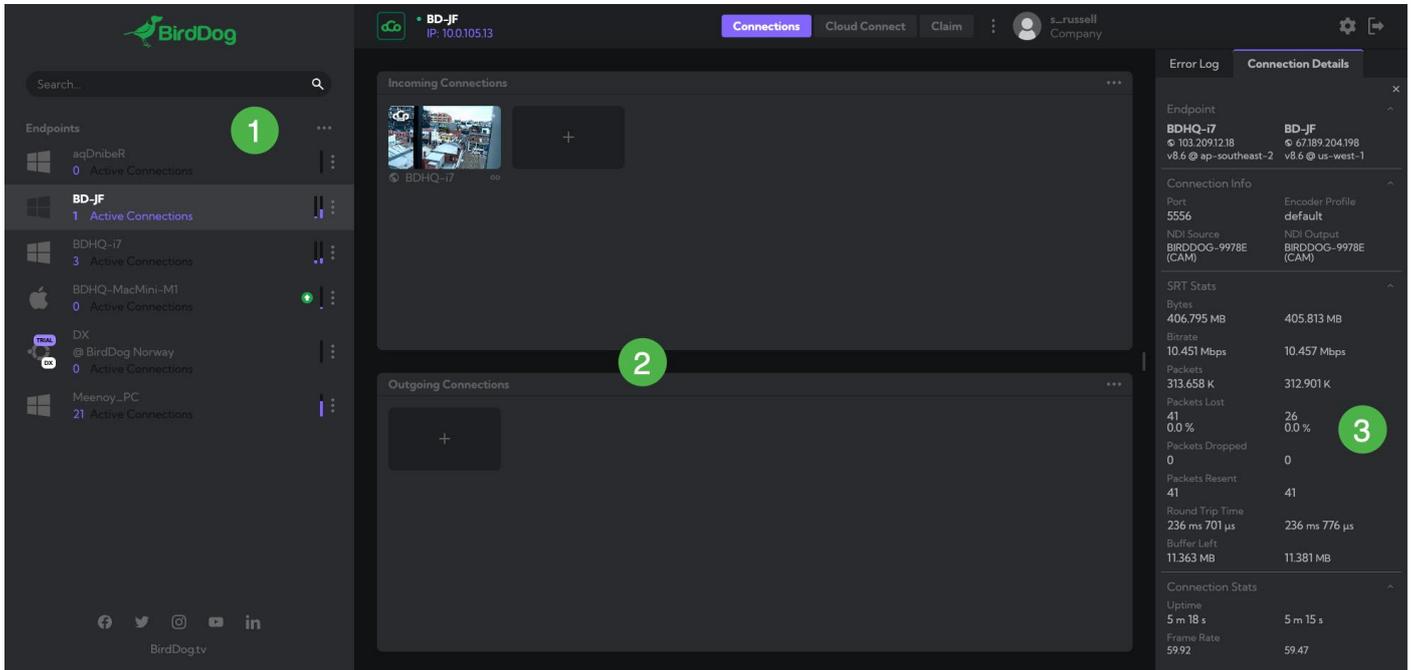
That's it! BirdDog Cloud takes care of the rest. It makes NDI® sources in different WANs feel and behave like local sources that can be directed to wherever you require them.

The conceptual overview below shows BirdDog Cloud managing the point to point SRT connection that delivers your NDI® video from, for example, San Francisco to Melbourne.





# Interface Overview



## 1. Endpoint Panel

An Endpoint is a computer to which are connected NDI® devices. The **Endpoints** panel shows all available Cloud Endpoints in your organisation. If an endpoint is active and connected to the internet, it will display in this panel. You can choose to hide offline Endpoints.

## 2. Incoming / Outgoing Connection Panels

Your created Incoming or Outgoing Connections are displayed in these panels as a realtime video thumbnail.

## 3. Connection Details

You can choose to display a comprehensive overview of your connection statistics.



# Getting Started

## Setting up your Account

It's easy to open an account and get a feel for BirdDog Cloud.

1. Click the following link <https://app.birddog.cloud/sign-up>
2. The **Sign Up** screen is displayed. Enter the requested Company Information. Click the **Next** button.

The screenshot shows the 'BirdDog - Sign Up' interface. At the top is the BirdDog logo. Below it is the heading 'Company information'. The form includes fields for 'Company Name', 'Country', 'Contact Name' (with sub-fields for 'First Name' and 'Last Name'), and 'Contact Email'. At the bottom right, there are 'Cancel' and 'Next' buttons.

3. Create a user account. Click the **Sign Up** button.

The screenshot shows the 'BirdDog - Sign Up' interface. Below the company information section is the heading 'Create first User account'. The form includes fields for 'Username' (with the value 'Userjohn'), 'Email' (with the value 'johndoe@test.com'), 'Password', and 'Confirm Password'. At the bottom right, there are 'Back' and 'Sign up' buttons.

4. You're in!

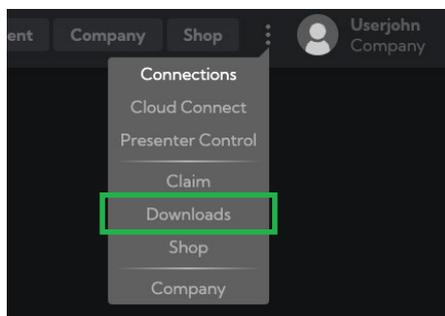
The screenshot shows the 'BirdDog - Welcome to BirdDog Cloud' page. The heading is 'First Steps'. It contains three numbered steps:

- 1. Getting around**  
Everything BirdDog Cloud has to offer is accessible from the ellipsis menu  in the top bar. The only exceptions to that are your own profile (click your user name) and your personal settings .  
Data management for your company is behind the 'Company' menu item. Here you can manage your Endpoints, Users etc. and set default values used for all Connections.  
The quick access bar left of the ellipsis menu shows the last pages you visited for quick switching.
- 2. Install the software**  
Download and install the BirdDog Cloud Endpoint software from the [Downloads](#) page.  
You need at least two installations on different computers.  
After installation, the Endpoint prompts you to claim it. This is how we link the Endpoint to your Company.  
You should at least configure the Endpoints with a name and recording directory, but you might also want to enable thumbnails and frame rate.
- 3. Make Connections!**  
Now you should see your new Endpoints in the side bar on the [Connections](#) page.  
Select an Endpoint and click the  button for incoming or outgoing connections. Double click the  button to make a Cloud Connect SRT connection, select the other Endpoint as source or target, select an NDI source on the left and click "Connect".  
You should now see your new Connection and, if you have enabled them, even live thumbnails.  
For Connections between two Endpoints, its just a matter of preference if you create them as incoming or outgoing. Incoming on one is outgoing on the other.



## Downloading and Installing a BirdDog Cloud Endpoint

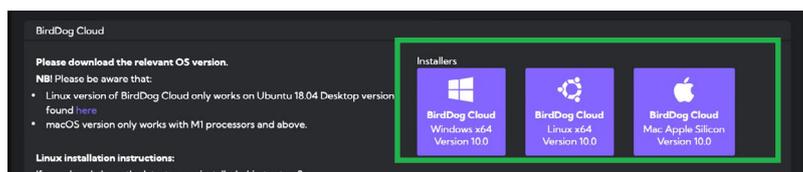
1. Click the dropdown list and select **Downloads**.



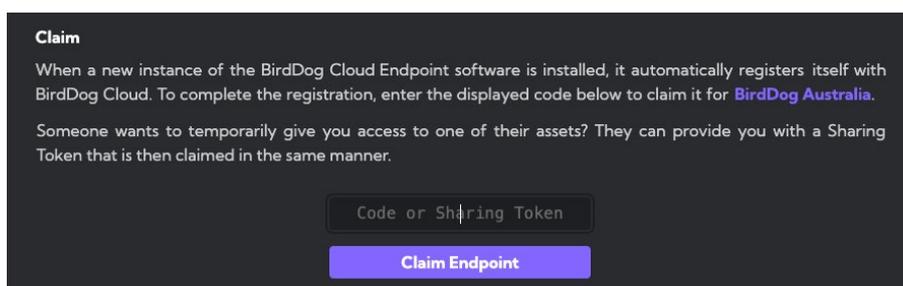
2. Download and install the BirdDog Cloud **Endpoint** software.  
Please refer to [here](#) for Mac installation and [here](#) for Ubuntu installation.

You'll need at least two endpoints running on different computers to operate all features of BirdDog Cloud effectively.

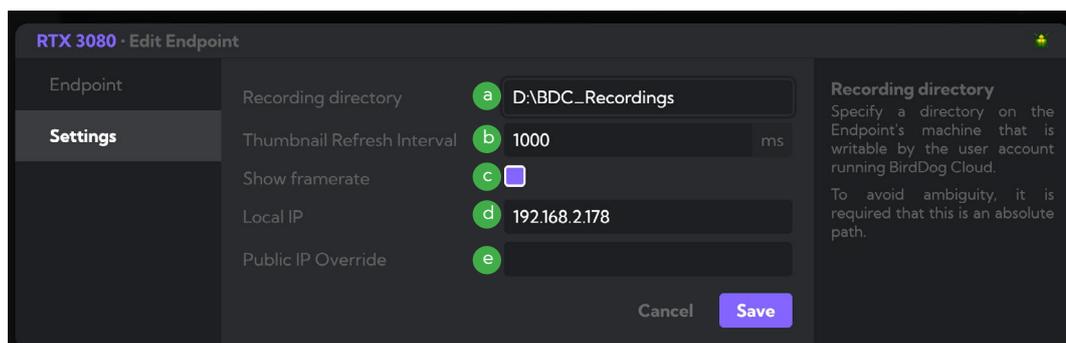
After installation, the Endpoint prompts you to claim it. Claiming an Endpoint links it to your Company.



3. The Claim window displays and you may claim the Endpoint.



4. After claiming an Endpoint, there's a few settings that need to be configured.





- a. Specify a writable **Recording Directory** for recordings using an absolute (complete) path.  
**NOTE** If you are a Linux user, please be aware that the BirdDog Cloud daemon is installed under a separate user account (bd-cloud), so the recording directory must be under this user, or this user must be given read/write permissions to the user account where you wish to write the recordings. Failing to add a valid recording path will lead to the daemon constantly restarting.
  - b. Set the **Thumbnail Refresh Interval** to a minimum of 1000 ms.
  - c. Select this checkbox to display the frame rate in the interface.
  - d. Add the local IP Address if you want Endpoints to connect on a local network. When two Endpoints have the local IP Address set, the Endpoints will connect to each other using those addresses rather than public-facing IP addresses. This is convenient when working over VPNs or local networks such as across campuses.
  - e. The Endpoint will automatically try to get the public IP Address by calling an external service at <https://api.ipify.org>. If, for any reason, the Endpoint cannot get to this service, it will NOT connect to the system backend. You can prevent this possibility by adding your public IP Address manually. This will stop the Endpoint from attempting to access the external service and connect using the Address provided.
5. Select **Company** from the dropdown list. Configuration settings for your Company are displayed.

The screenshot displays the BirdDog web interface. On the left is a dark sidebar with the BirdDog logo and a navigation menu including: Company, Overview, Endpoints, Reporters, Endpoint Groups, Configurations, Cloud Connect Groups, TURN Servers, Users, ACL, API Tokens, Subscription Management, and Cloud Connect TURN Quota. The main content area is titled 'Company' and contains several configuration panels:

- Cloud Connect TURN Quota:** Includes a 'Quota' field with '0 B' and an 'Auto top-up' toggle set to 'OFF'.
- Settings:** Includes a 'Warnings Email' field with 'johndoe@test.com' and a 'TURN Server' dropdown menu with a 'Save' button below it.
- Defaults:** A row of six settings:
  - SRT Start Port:** 5555
  - SRT Connect Type:** Radio buttons for 'Rendezvous', 'Caller → Listener' (selected), and 'Listener → Caller'.
  - SRT Latency:** 120 ms
  - SRT Overhead:** 25 %
  - SRT allow packet drop:** Radio buttons for 'Enable' and 'Disable' (selected).
  - SRT Encryption:** Radio buttons for 'Off' (selected), '128 Bit', '192 Bit', and '256 Bit'.
- Timecode Handling:** Radio buttons for 'NDI Time Stamp', 'NDI Time Code' (selected), and 'Generated'.
- Configuration:** A dropdown menu.
- Cloud Connect Bitrate:** A slider set to 'Mbps'.
- Preferred CC Codecs:** A list of codecs with their respective RC Window Sizes:
  - H.264 Software: 500 ms
  - VP8: (no value)
  - VP9: (no value)
  - VP9 QSV: 500 ms
  - H.264 NVENC: 20 ms
  - H.264 VideoToolBox: 100 ms



## Subscriptions

BirdDog Cloud is licensed by Subscriptions. This allows access to the platform for a certain number of concurrent connection. For example, each live connection you have between two locations counts as a single connection. You can select the appropriate package for your organisation when purchasing a Subscription Package. The amount of connections can be changed at any time (increased or decreased) according to your current requirements.

It is possible to auto-renew subscriptions to ensure the service continues uninterrupted.

### Connection Subscriptions explained

When you first sign up for BirdDog Cloud, you are not subscribed for any connections. This means that each connection will be watermarked with a 'Trial' message burned in.

You may select a package from the **shop**, this package will have the included number of connections. These connections represent the maximum number of simultaneous, or concurrent media connections you have operating across your organisation. The system will count any type of connection in this number, including RTMP, Cloud SRT, Cloud Connect, Generic SRT and Recording. If you exceed the number of subscribed connections in your BirdDog Cloud organisation the subsequent connections will also be watermarked with a 'Trial' message burnt in.

The moment your connection is stopped, the usage is released allowing you to use a different connection. You are able to purchase extra connections to scale BirdDog Cloud to your organisations needs.

Please note that any connections that were active when an Endpoint went offline will be counted. **You should always stop any connections before shutting down an endpoint.**

### Purchasing a Subscription Package

1. In the **Shop**, you can purchase **Packages** that are appropriate for your Company requirements. Please view the Packages and Pricing on this [webpage](#).

Package Name	Price	Quantity	Action
Standard Package (3 connections)	US\$149.00	1	Add to Cart
Premium Package (10 connections)	US\$299.00	1	Add to Cart
Extra Connection (1 connection)	US\$50.00	1	Add to Cart

2. During the purchase process you will have the option to disable automatically activate your purchase, it is recommended to use this method. Manually applying a subscription is described in the next section.

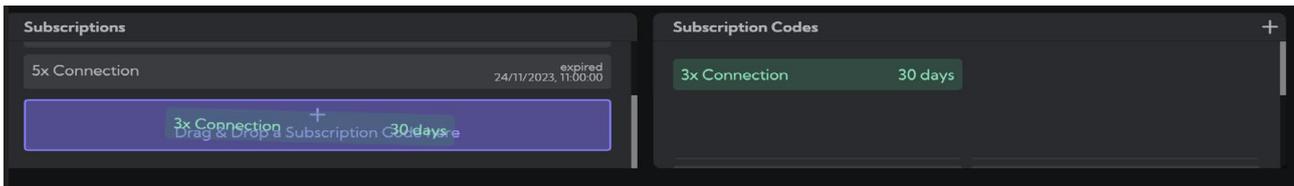
Article	Activate on purchase	Unit Price	Quantity	Price
Extra Connection (auto-renewable)	<input checked="" type="checkbox"/>	US\$50.00	1	US\$50.00
<b>Total:</b>				<b>US\$50.00</b>



## Applying a subscription package

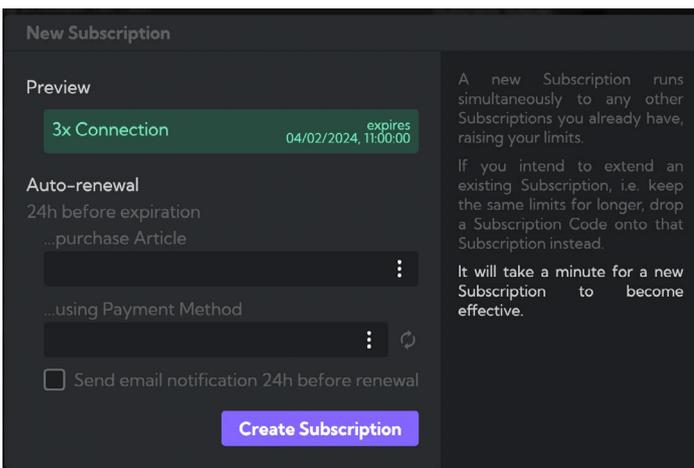
Once you have purchased a subscription package, you will need to apply this within the **Subscription Management** section, this is found under **Company** setup accessible via the elipsis on the top of the browser window

Locate your subscription and drag it from the **Subscription Codes** section across to the **Subscriptions** section – this applies the subscription code and activates the appropriate subscription.



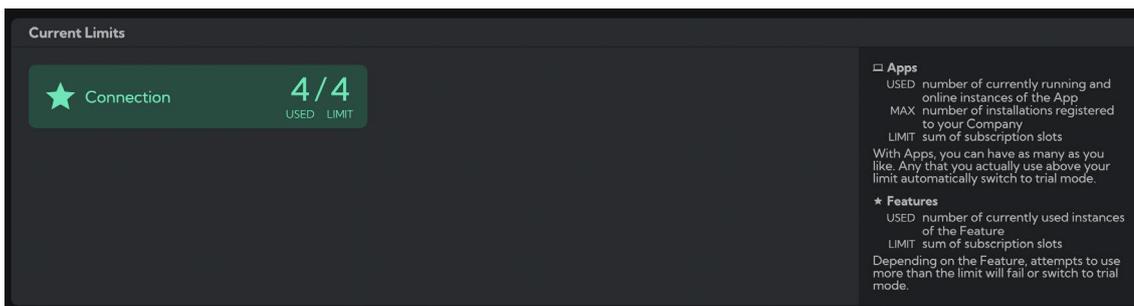
## Activating a Subscription

After Applying the subscription code you will be presented with options for auto-renewal of these subscriptions to ensure your system remains operational. You can select the notification box if you would like to be reminded of these renewals BEFORE they are charged.



## Displaying current subscription status

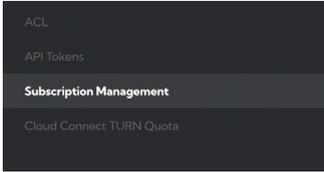
You can display the current subscription status along with the amount of currently used connections at the top section of the Subscription Management screen.



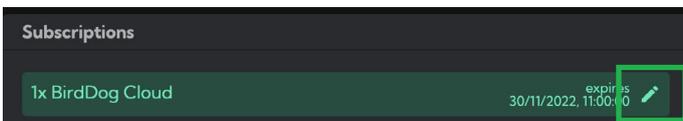


## Subscription Renewal

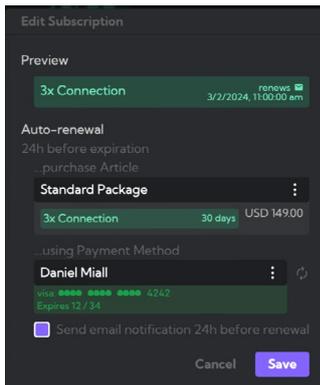
1. Select **Subscription Management**.



2. The **Subscriptions** window is displayed. Click the **Edit** button.  
**NOTE:** This button is only displayed before the subscription has expired.



3. The **Edit Subscription** window is displayed.
  - a. Choose an **Article** that you wish to auto renew. Selecting a 30 day product will renew every 30 days thereafter.



- b. Select the **Payment Method** to use and if you would like email notification before renewal.



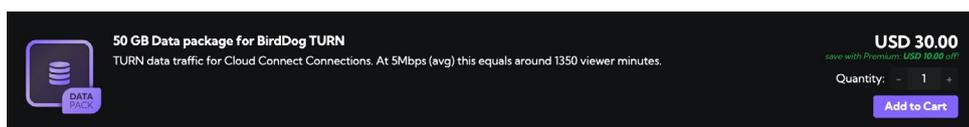
## Turn Quotas for Cloud Connect connections

The type of connection called Cloud Connect allows you to send Audio and Video to any device with a web browser including Smart TVs and handheld devices. This service uses a technology call TURN to negotiate a secure connection from your source location to the receiving device. Since this data is shared across the internet via a TURN server, there is an associated data cost. If your organisation has their own TURN server, it is possible to configure BirdDog Cloud Connect to use this, for all other configurations you are required to purchase TURN data/time subscriptions.

Cloud Connect is intelligent enough to identify if there is a method of connection between the source and your receiver which does not need to utilise TURN data, in this case there is no data usage counted or charged for. Examples of situations where connections do not consume TURN data are across a company WAN, or in some cases connections that share the same Internet Service Provider (ISP) or mobile carrier.

## Purchasing a TURN Subscription package

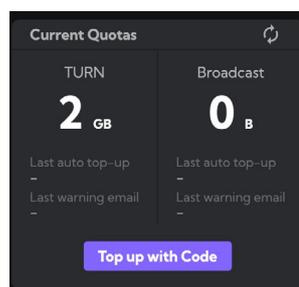
1. In the **Shop**, you can purchase TURN data in **Packages** of 50Gb, the description of the package will give you an approximate indication of the amount of minutes this equates to. Please view the Packages and Pricing on this [webpage](#).



2. During the purchase process you can select auto activate to apply the purchase immediately, alternatively you can manually apply the package in as per the Top up TURN Data quota with code below.
3. If you selected not to auto activate your purchase, you will be emailed a TURN activation code that you can activate at any time

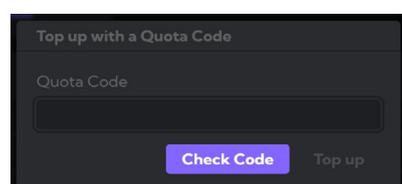
## Displaying current TURN usage

At any time you can display the amount of data you have used of your current TURN Data quota. In **Company** under the **Cloud Connect Quota** section you will see a display of Cloud Connect Quotas



## Top up TURN Data quota with code

If your TURN data is depleted, you can press the **Top up with Code** button and apply the code you have previously purchased to add additional data to the Cloud Connect service ensuring the system will continue to operate over Cloud Connect connections.





## Auto Top up TURN Data

In addition to manually applying data packages, you can enable auto Top up on your TURN data to ensure there are no interruptions to your connection. You can enable notifications to inform you of upcoming Top up activity and select the charge method. It is also possible to limit the Top up activity to once/daily to ensure there is no unauthorised long-term use of the data.

**Auto top-up TURN Quota** Off  

When Quota is below  GiB 

...purchase Article  

50 GB US\$30.00

...using Payment Method  

visa: ●●●● ●●●● ●●●● 4242  
Expires 05 / 24

Limit auto top-ups to once/day  
Prevent excessive topping-up due to misconfiguration or malicious users.

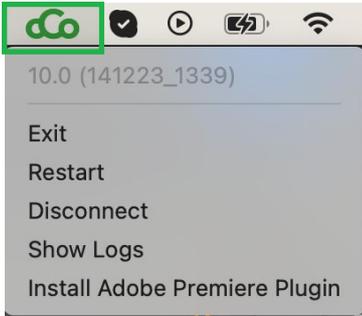
Send email when Quota falls below threshold and not topping up automatically  
Either when the daily top-up limit is in effect and exceeded or when auto top-up is not enabled at all.

This will turn auto top-up on

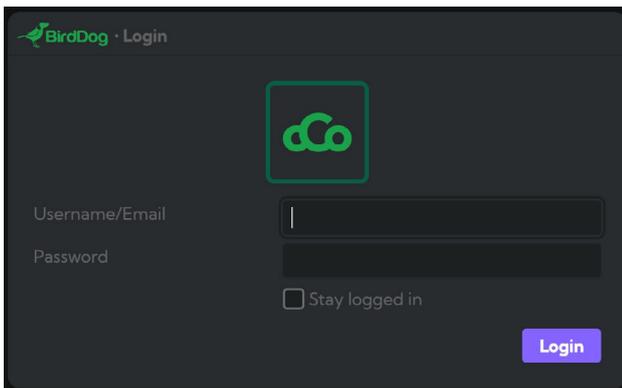


## Cloud Login

1. Once BirdDog Cloud is installed on a host PC, its icon will be displayed in the System Tray. Right click the icon to show the options.

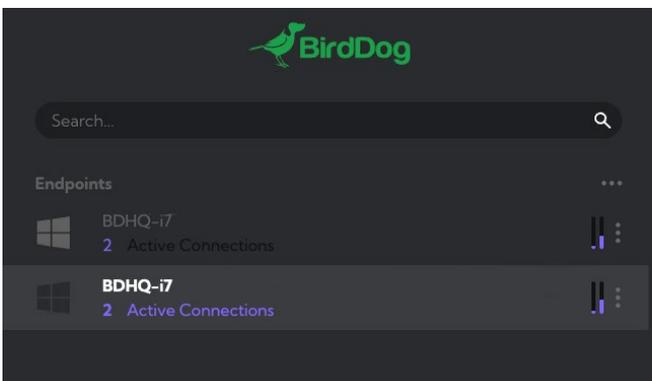


2. To begin using BirdDog Cloud, please login at [app.birddog.cloud](https://app.birddog.cloud) using your Username and Password.



## Endpoints

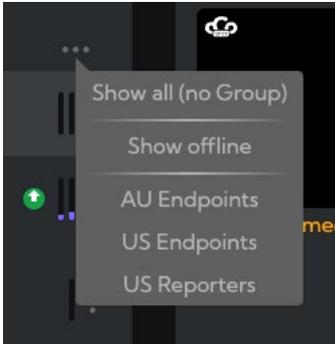
A BirdDog Cloud Endpoint is a BirdDog service running on a computer which has access to local NDI® sources and devices. The Cloud Web console displays all available BirdDog Cloud Endpoints in your organisation – if an Endpoint is active and connected to the internet, it will be displayed.





Endpoints have a dropdown menu that displays key information about the Endpoint.

- a. Click the dropdown to show any Endpoint Groups you have created. You can also choose to hide Endpoints that are currently offline.



- b. When a new version of the Endpoint software is available, a green arrow will appear showing that there is an update available. Select update from the Endpoint dropdown.



- c. Active connections display bar graphs that show CPU and GPU activity.





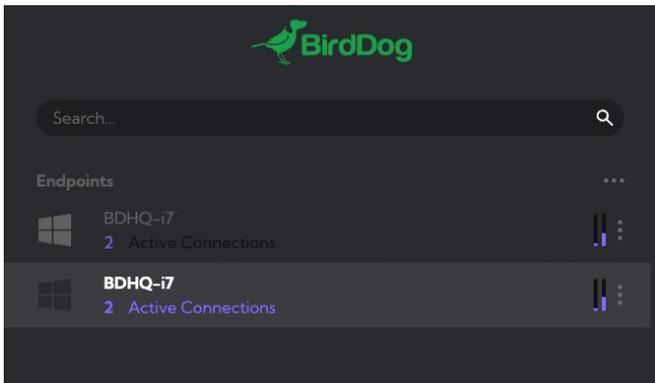
## Making Connections

All connections begin by selecting your desired Endpoint and either an Incoming or Outgoing Connection for that Endpoint.

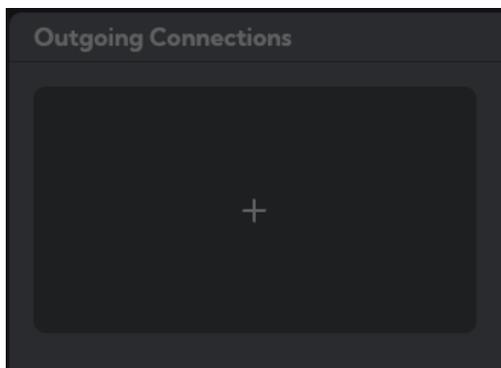
**NOTE:** Incoming Connections are limited to three options. BirdDog Cloud Endpoints over SRT, BirdDog Cloud Connect Connections and SRT Connections.

### Selecting your Endpoint and Connection Type

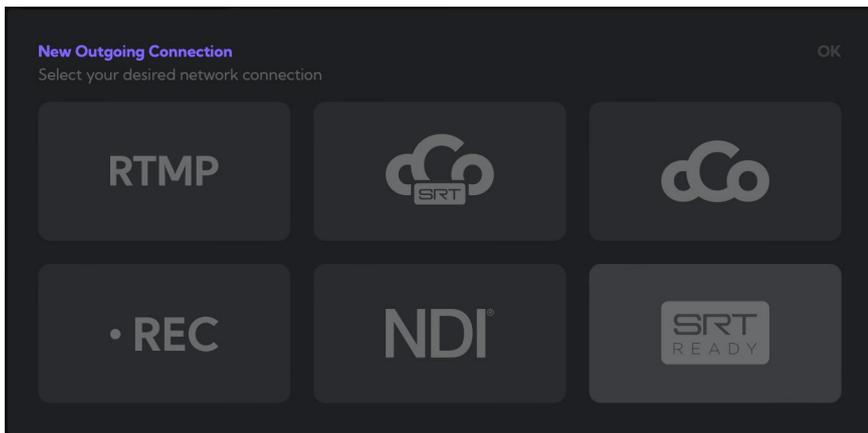
1. In the **Endpoints** panel, click on an Endpoint to select it.



2. Click either the Outgoing or Incoming Connection creator.



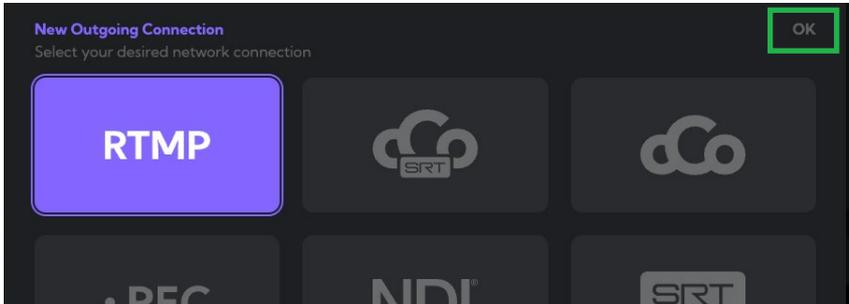
3. To complete your connection, select your desired transport medium. These mediums are described in the following pages



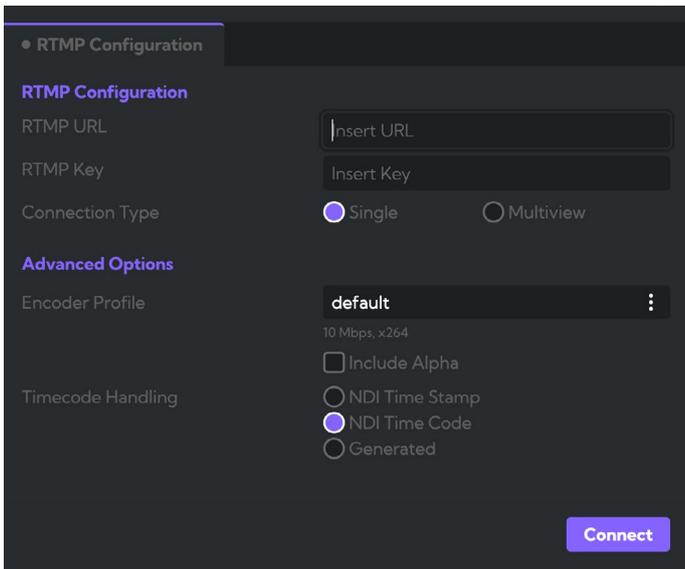


## Creating an RTMP Connection

1. Select the **RTMP** button and click **OK**. This creates an RTMP connection that is suitable for Content Delivery Networks (CDN) such as Youtube Live and Facebook Live.



2. The **RTMP Configuration** dialogue is displayed. Select your available source from the left panel and complete the RTMP Configuration.



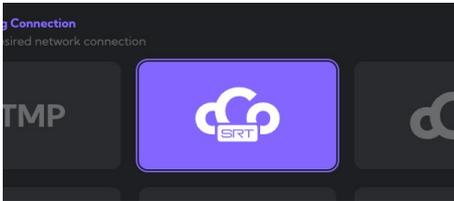
- a. Choose your desired TX Source. These are all of the available sources at the selected Endpoint.
- b. Enter your RTMP **Server URL** and **Stream Key**.
- c. Select your **Connection Type**.
- d. Select your **Encoder Profile**.
- e. Select your preferred **Timecode Handling**.
- f. Click the **Connect** button to create the connection.



## Creating a Cloud Endpoint Connection

You can create and view a Cloud Endpoint Connection to connect your sources in a remote location to another site.

1. Select the BirdDog Cloud Endpoint (over SRT) connection button and click OK.



2. The **SRT Configuration** dialogue is displayed.

Begin by choosing your desired TX Source. These are all of the available sources at the selected Endpoint.

- a. Select the **Target Endpoint** from the dropdown list.
- b. Enter the **Port** number. Select the **Auto** button to have this automatically assigned within your company settings.
- c. Choose your **Connection Type**.

- **Single**

Single Full Screen view of the NDI® source. This is the simplest form of connection and will direct the output of a single source to your receiving Endpoint.

- **Multiview**

*Multiview* or *Presenter* control. With Multiview you can construct several Multiview layouts including a popular two large, 8 small layout or an automatically configured output. Options for Multiview include tally borders, audio level overlays and UMD Source labels.

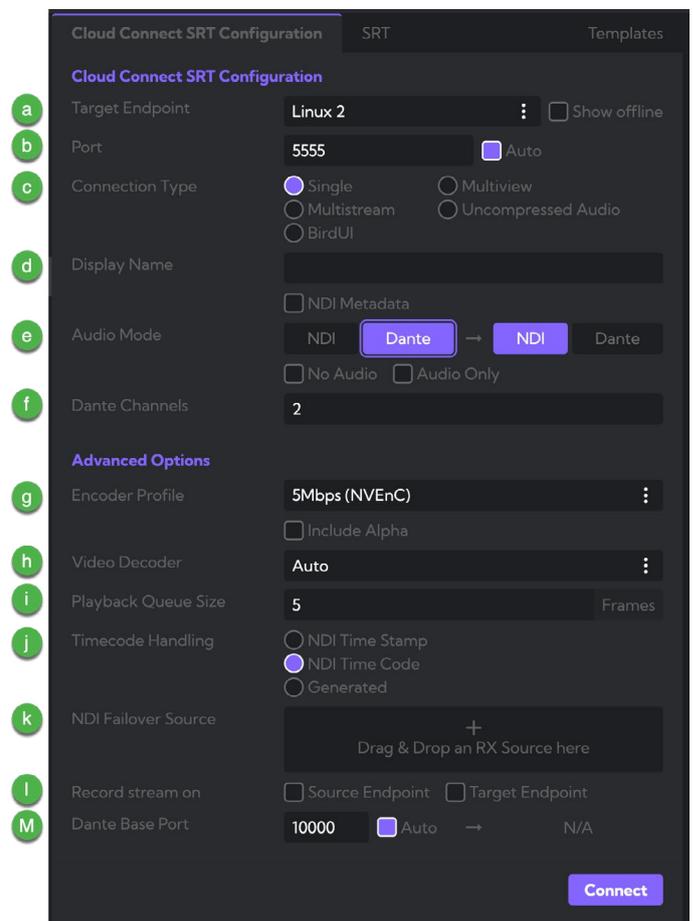
- **Auto Grid:** Generally you can leave this as Auto Grid, as this will resize all sources to be as large as possible while displaying all selected sources.
- **2+8:** Arranges your Multiview with two larger displays at the top and 8 smaller displays underneath. Useful for Preview, Program and additional monitored sources.

- **Multistream**

Choose to send multiple streams over a single port SRT connection.

- **Uncompressed Audio**

Send uncompressed audio only. For example, convert Dante audio to NDI® and transmit via BirdDog Cloud.

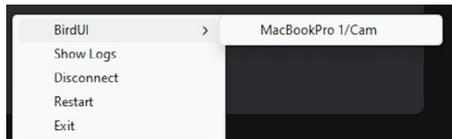




- **BirdUI**

This feature enables remote browser access of the Web control – BirdUI for BirdDog devices via SRT. It uses four ports on the RX endpoint. The first is the SRT port – for example port 5560, then three consecutive ports are reserved up to port 5563. The next connection must then use port 5564.

After the connection is set up, you can click on the system tray and connect to the BirdUI which is depicted by the naming of the source Endpoint and the Cloud connection name given.



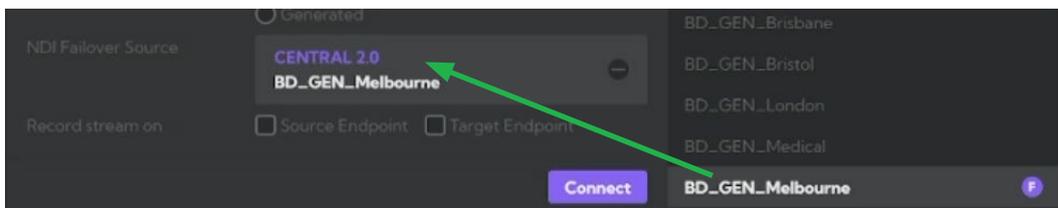
- d. You can give the incoming NDI® stream a memorable **Display Name** for display on your receiver. Select the NDI® Metadata checkbox to transmit metadata such as Tally or PTZ control via the SRT link. If your source supports NDI KVM control, then this will also be passed through the connection
- e. Set the desired **Audio Mode**. Select the buttons to choose the input and output protocol. When Dante is selected, the Endpoint (TX or RX) will create Dante audio channels in Dante Controller.

**N.B.** If your NDI source does not contain Audio, you must select the NO AUDIO option when setting up the connection.

- f. Set the number of **Dante Channels** (maximum of 32). You can also choose an audio only connection or one with no audio. You can also choose the computer's network interface that Dante will use to transmit and receive audio.

### Advanced Options

- g. Choose the **Encoder Profile**. You can create custom encoder profiles for different encoding, i.e., for an Intel GPU QuickSync, or Nvidia NVENC.
- h. Choose what **Video Decoder** your computer will use for the stream.
- i. Set the **Playback Queue Size**. You can adjust this video buffer size to provide smooth playback. The default is 5 frames. Using a lower buffer size will result in lower overall latency connections, using a higher buffer size will smooth video on more unstable connections.
- j. Choose the desired **Video Decoder**. This selection will depend on the NDI® stream encoder.
- k. Select your desired **NDI Failover Source**. If the selected source is interrupted for any reason, the NDI® output generated by Cloud will describe the desired alternative NDI® source to automatically switch to. Drag an available NDI® source from the right side **Select RX Source** panel into the NDI® Failover Source panel.



- l. You can choose to record the encoded stream at either the Source or Target Endpoint. The encoder configuration selected for the SRT connection will also be used for the recordings.
- m. Set the **Dante Base Port** if you have a specific port. Otherwise select the **Auto** checkbox to have the default system port assigned.



### 3. Select the SRT tab.

- **Connect type**

In order to establish a bidirectional stream, SRT employs a handshake mechanism where each device identifies itself as a **Caller** or as a **Listener**. In certain cases, two devices can simultaneously negotiate an SRT session in what is referred to as **Rendezvous** mode.

#### Caller

- Sets a source or destination device as the initiator of an SRT streaming session.

#### Listener

- Sets a device to wait for a request to start an SRT streaming session. The Listener device only needs to know that it should listen for an SRT stream on a certain port. **NOTE:** The UDP traffic (UDP port(s)) must be port forwarded from the outside of the firewall to the internal IP address of the Listener Endpoint.

#### Rendezvous

- Allows two devices to negotiate an SRT session over a mutually agreed upon port. Both source and destination must be in Rendezvous mode. Rendezvous mode allows SRT traffic between the source and destination to traverse a firewall without the need for an IT administrator to open a port, as long as the firewalls are "stateful". A stateful firewall is a firewall that is configured to keep track of and monitor the state of active network connections while analyzing incoming traffic.

- **Latency**

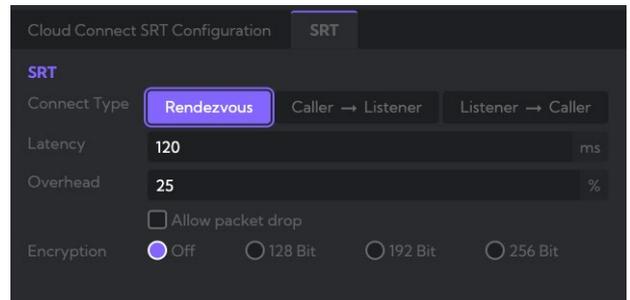
Sets how long the receiver should wait for retransmissions. The default is 120 ms.

- **Overhead**

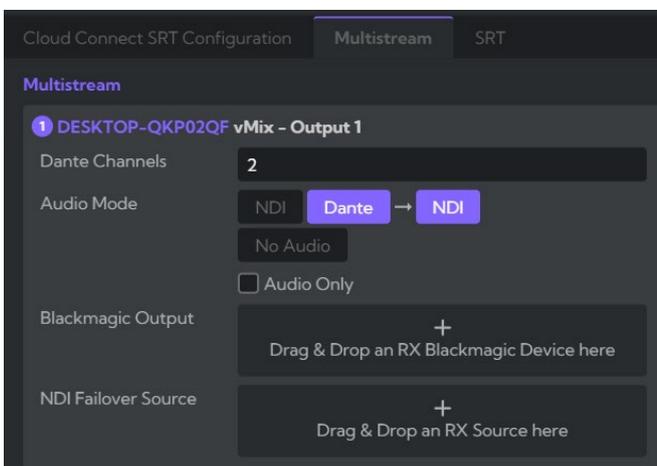
Defines how much data can be used for retransmission.

- **Encryption**

Sets the desired level of Encryption.

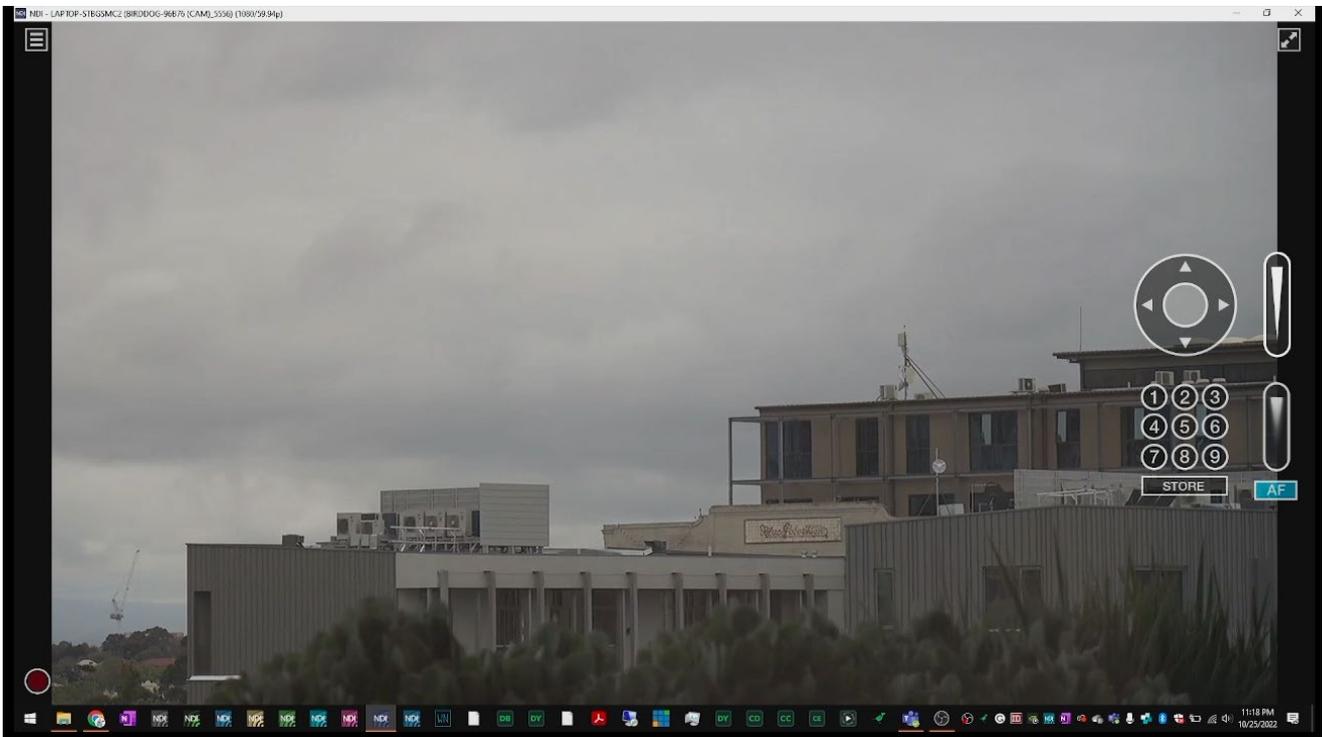
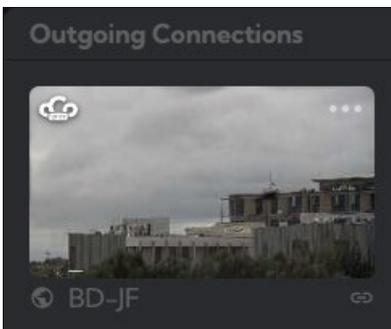


### 4. If you have chosen a Multistream connection, select the Multistream tab.





- a. Set the number of **Dante channels** (maximum of 32).
  - b. Set the **Audio Mode**. Select the buttons to choose the input and output protocol. Currently, Dante is not an output option.
  - c. Add a **Blackmagic Output** device if desired.
  - d. Select your desired **NDI Failover Source**. If the selected source is interrupted for any reason, the NDI® output generated by Cloud will describe the desired alternative NDI® source to automatically switch to. Drag an available NDI® source from the right side Select RX Source panel into the NDI® Failover Source panel.
5. Click the **Next** button to exit the SRT tab and then click the **Connect** button. A live video thumbnail of the selected Source is displayed. If you selected the NDI® Metadata checkbox, you can control your PTZ camera.



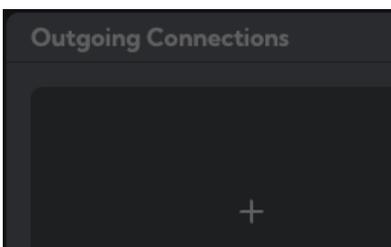


## BirdUI Display

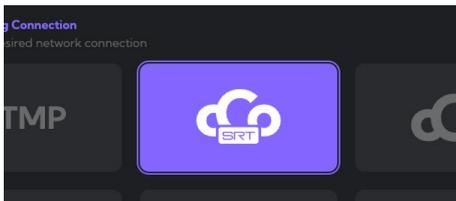
In addition to regular Audio/Video connections from one location to another, you can set up another type of connection to gain access to the Web configuration panel of your BirdDog Camera, BirdDog Converter, or other NDI hardware device. On BirdDog Devices this is known as the BirdUI. The benefit of this, is it allows for full control of all settings of the source device from anywhere in the world. Importantly the connection is fully encrypted over the BirdDog Cloud / SRT connection keeping all settings safe.

To Connect a BirdUI or other WebUI remotely you need to open up a new connection.

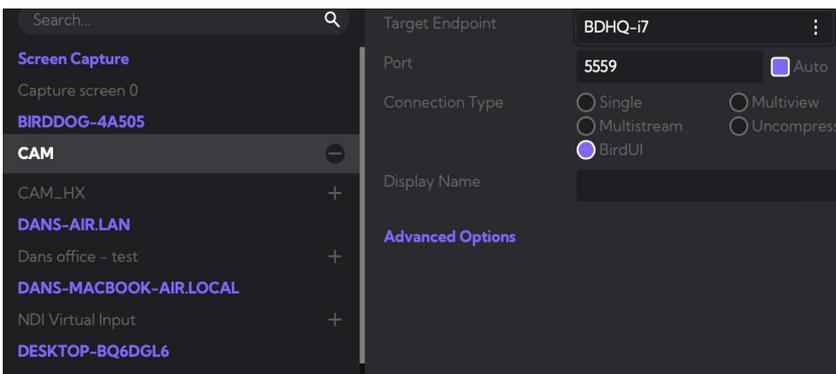
1. Click either the Outgoing or Incoming Connection creator.



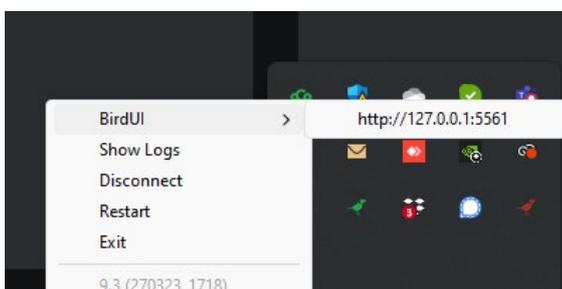
2. Select the BirdDog Cloud Endpoint (over SRT) connection button and click OK.



3. Select BirdUI as the connection type



You can open the Web configuration panel of the BirdDog Camera or Converter device – known as the BirdUI directly from the **System Tray** of the Endpoint. Right click on the Cloud icon to display the menu and select BirdUI and the address of the device.





## Creating a Cloud Connect Connection

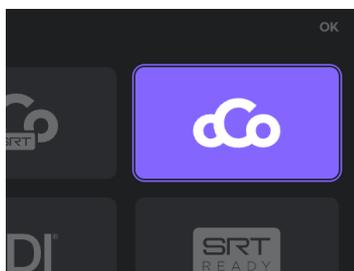
Cloud Connect is a suite of applications that allow you to easily add and securely stream, with ultra low latency, live video sources from your local network over the public internet to a receiver. The receiver can be either a web browser, or dedicated application, on a computer monitor, tablet or TV. Cloud Connect leverages the power of Groups, allowing you to direct your sources to multiple Endpoints in a Group.

By combining NDI® sources with the BirdDog Cloud processing engine, Cloud Connect offers you truly global reach, keeping more people in contact with your production.

### Creating the Connection

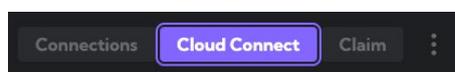
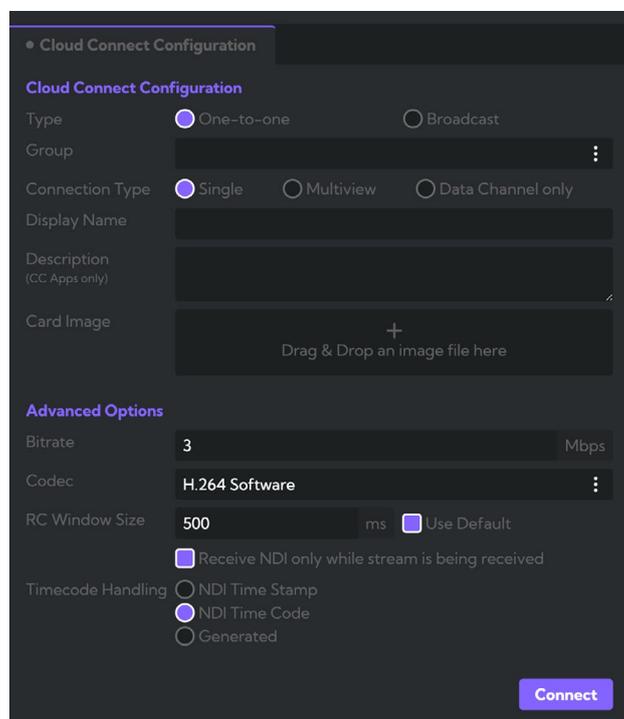
In this example, we will create and view an Outgoing Cloud Connect connection from the selected Endpoint.

1. Select the **Cloud Connect** button and click **OK**.



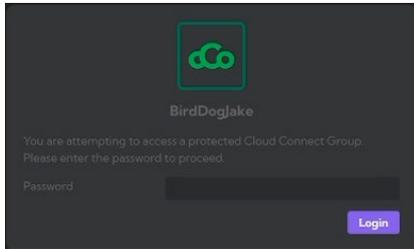
2. The **Cloud Connect Configuration** dialogue is displayed.

- a. Choose your desired **TX Source**. These are all of the available sources at the selected Endpoint.
- b. Select the Cloud Connect **Group** to which the video will be published. Groups are defined in the BirdDog Cloud Group management in the **Company** setup section of BirdDog Cloud. Groups can have their own branding, colours and background card image.
- c. Select the **Connection Type**.
- d. You can give the incoming NDI® stream a memorable **Display Name** on your receiver.
- e. Upload a **Card Image** that will be displayed. It is recommended that each card image not exceed 640x360 pixels to ensure fast source browsing in your applications.
- f. Set the desired **Bitrate**.
- g. Click the **Connect** button to create the connection.
- h. Click the **Cloud Connect** button to open Cloud Connect. If this does not appear in the navigation bar at the top of the browser window, use the ellipsis to the right to select Cloud Connect from the drop down menu

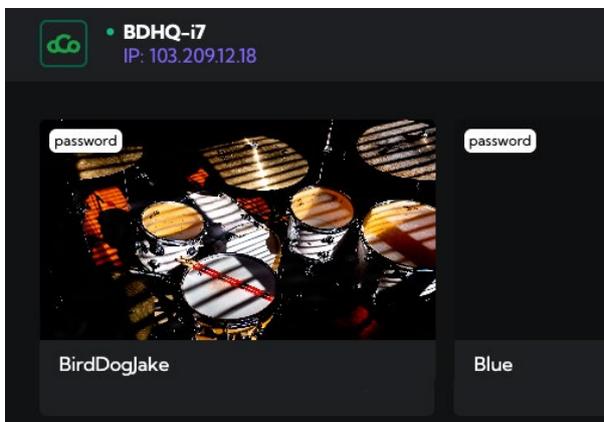




- i. Login to your **Cloud Connect** page, if there is a Password or PIN number set you will be prompted to enter this.



- j. Select your **Group**, enter the password and view the video.

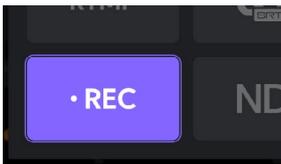




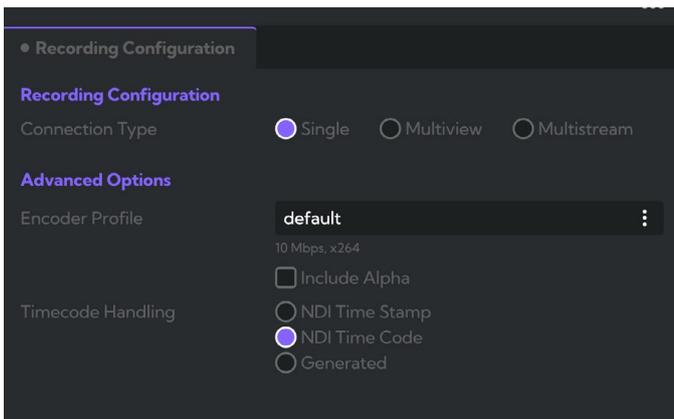
## Recording a Stream

You can choose to locally record a stream, the format can be selected based on your Encoder configuration and may include various Compression formats available in your system. These formats include h.264, h.265, ProRes and more. Since the local NDI stream to the Endpoint is being recorded, you may choose a different recording encoding profile/configuration than that used for the SRT transport medium, for example, that you use to send over the internet.

1. Select the **Record** button and click **OK**. You can choose to record the encoded stream at either the source or destination.



2. Select the settings appropriate for recording, noting that there is an option on Apple ARM (MAC M1 or M2) based machines to record the video into native ProRes files.
3. The recorded files will be stored in the recording folder defined in the Endpoint setup during the claiming process, this can be edited from the endpoint list in the main connection window.



## Creating a Local NDI® Connection

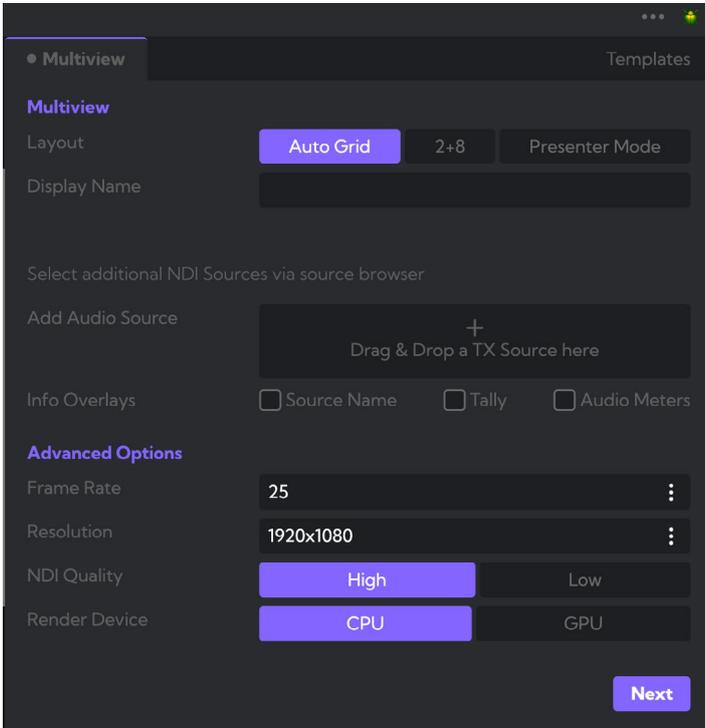
You can choose to stream a local NDI® connection in a variety of Multiview layouts as well as adding basic switching capabilities, known as Presenter controls. You can also add Audio from alternative sources to mix together..

1. Select the **NDI Connection** button and click **OK**.





2. The **NDI Configuration** dialogue is displayed. Select your available source from the left panel, complete the configuration and click the **Save** button.



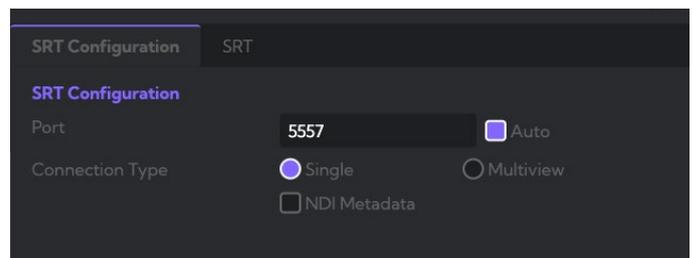
3. The NDI® stream thumbnail displays on the **Outgoing Connections** panel.



## Creating a generic SRT Connection

You can choose to send a source to a destination via SRT. Use this option when connecting a BirdDog Cloud Endpoint to another vendor's SRT encoder/decoder.

- a. Choose your desired **TX Source** on the left side. These are all of the available sources at the selected Endpoint.
- b. Enter the **Port** number. Select the **Auto** button to have this automatically assigned within your company settings.
- c. Choose your **Connection Type**.



- **Single**

Single full screen view of the NDI® source. This is the simplest form of connection and will direct the output of a single source to your receiving Endpoint.



- **Multiview**

Multiview or Presenter control. With Multiview you can construct several Multiview layouts including a popular two large, 8 small layout or an automatically configured output. Options for Multiview include tally borders, audio level overlays and UMD Source labels.

- **Auto Grid:** Generally you can leave this as Auto Grid, as this will resize all sources to be as large as possible while displaying all selected sources.
- **2+8:** Arranges your Multiview with two larger displays at the top and 8 smaller displays underneath. Useful for Preview, Program and additional monitored sources.

- **NDI Metadata**

Select this checkbox if you wish to send Tally or PTZ control data.

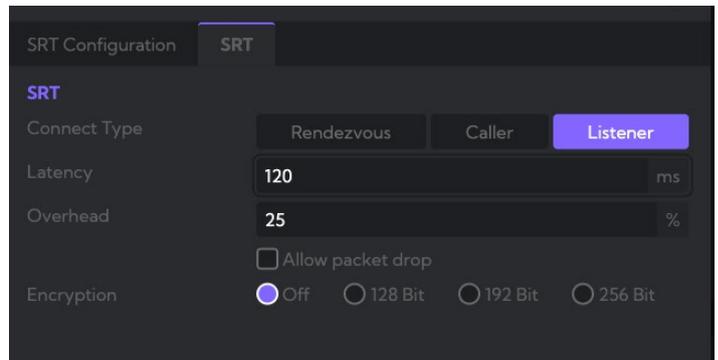
d. Select the **SRT** tab.

- **Connect type**

In order to establish a bidirectional stream, SRT employs a handshake mechanism where each device identifies itself as a **Caller** or as a **Listener**. In certain cases, two devices can simultaneously negotiate an SRT session in what is referred to as **Rendezvous** mode.

**Rendezvous**

- Allows two devices to negotiate an SRT session over a mutually agreed upon port. Both source and destination must be in Rendezvous mode. Rendezvous mode allows SRT traffic between the source and destination to traverse a firewall without the need for an IT administrator to open a port, as long as the firewalls are "stateful". A stateful firewall is a firewall that is configured to keep track of and monitor the state of active network connections while analyzing incoming traffic.



**Caller**

- Sets a source or destination device as the initiator of an SRT streaming session.

**Listener**

- Sets a device to wait for a request to start an SRT streaming session. The Listener device only needs to know that it should listen for an SRT stream on a certain port. **NOTE:** The UDP traffic (UDP port(s)) must be port forwarded from the outside of the firewall to the internal IP address of the Listener Endpoint.

- **Latency**

Sets how long the receiver should wait for retransmissions. The default is 120 ms.

- **Overhead**

Defines how much data can be used for retransmission.

- **Encryption**

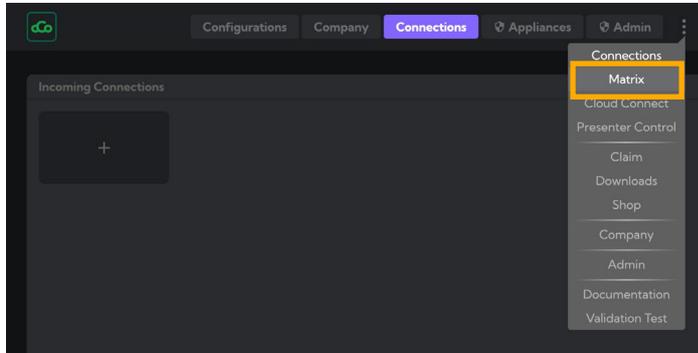
Sets the desired level of Encryption.



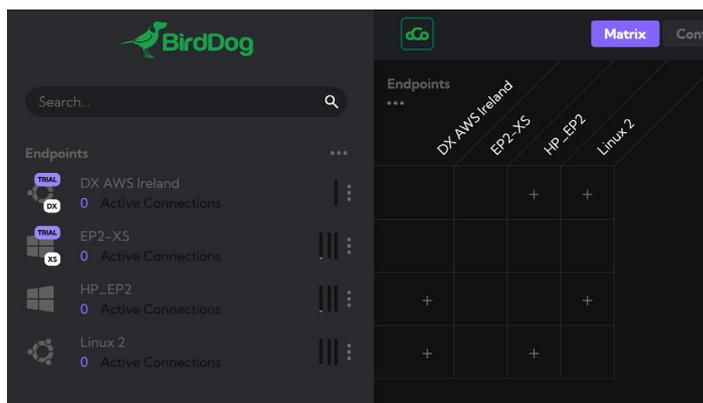
## SRT Connection Matrix

SRT connections also offer a **Matrix** view that provides an overview of all connections.

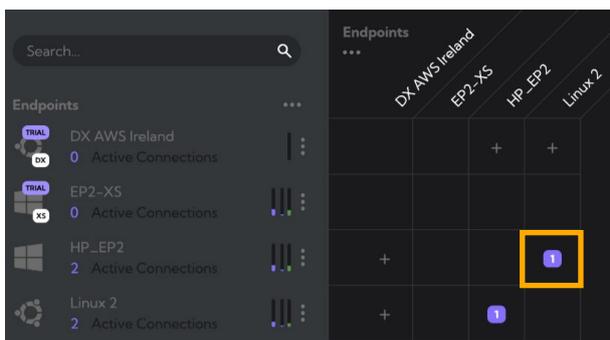
- Click the **Ellipsis** button and select **Matrix**.



The Matrix shows all available BirdDog Cloud SRT endpoints in your organisation. If an Endpoint is active and connected to the internet, they will display in your connection matrix.



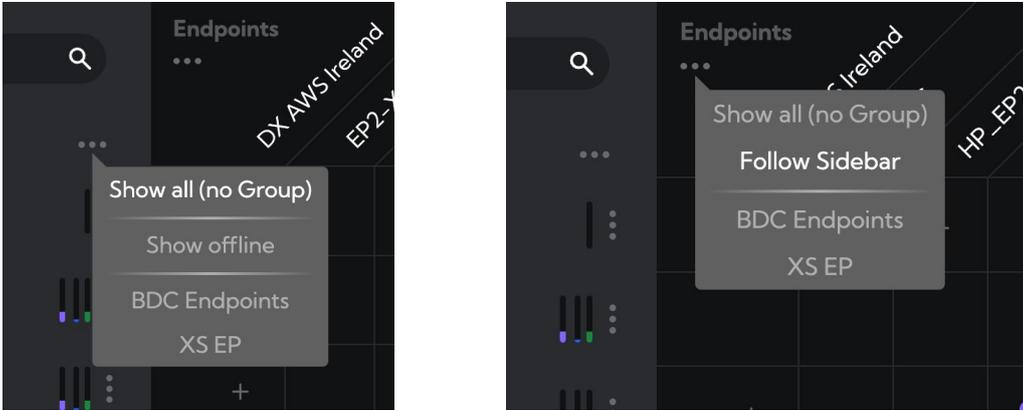
- Create a connection by clicking the + sign at the intersection between two Endpoints. Missing + signs at an intersection between two Endpoints indicates that your Endpoint has not discovered any NDI sources on your network.
- An SRT connection will be established between the Endpoints and the number 1 will be displayed indicating a connection with one stream. Right click to add more streams. Connection data and a thumbnail image of the connection is displayed. Click on the small separating disclosure icon to display full details of the connection.





## Endpoint Groups

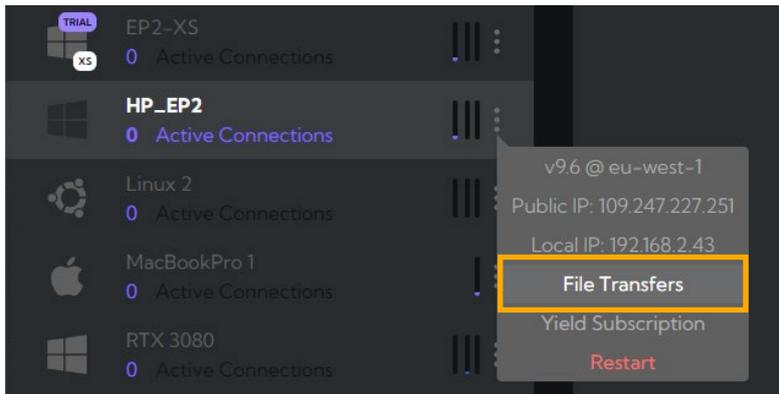
The same Endpoint Grouping can be applied in the Matrix on both the TX and RX side.



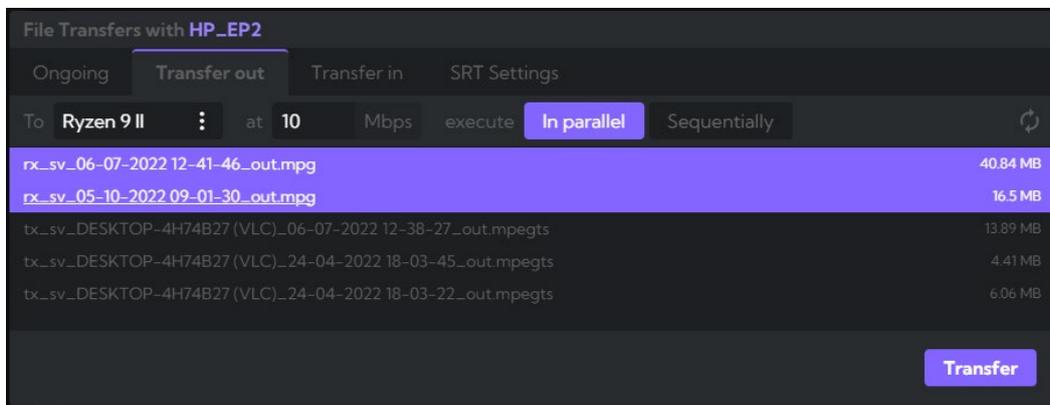
## SRT File Transfer

You can transfer files via SRT.

- Click the **Ellipsis** button on the Endpoint and select **File Transfers**.



- Current transfers are displayed. Choose to transfer files in or out (currently only video files) by clicking on the respective tab.





### Transfer Out

Click the **Transfer Out** tab. All video files in the recording directory set for this particular Endpoint are displayed. Select the files you wish to transfer, and select receiving Endpoint, bitrate and other SRT parameters (Rendezvous, Caller --> Listener, Listener --> Caller). Click the **Transfer** button.

### Transfer In

Click the **Transfer In** tab. Choosing the sending Endpoint will display all files listed in the recording directory for that Endpoint. Select the files you wish to transfer and click the **Transfer** button.

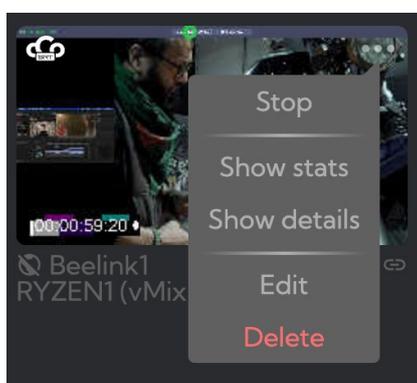
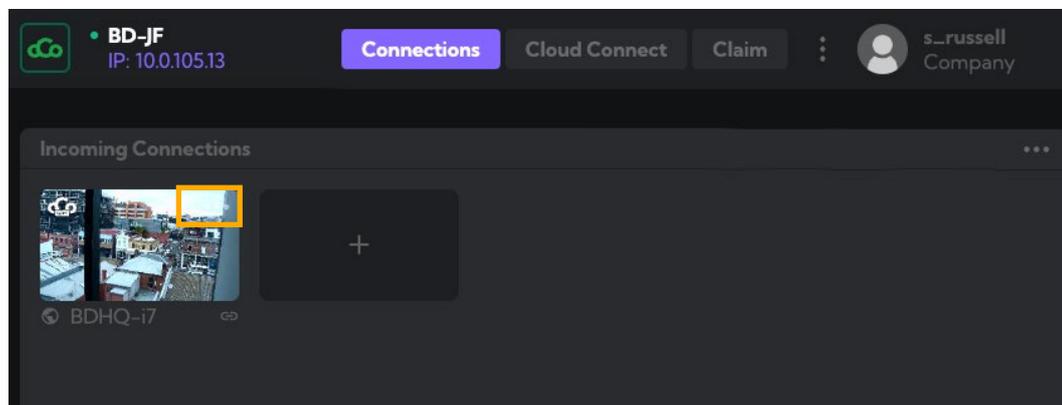
When a Transfer is finished, click the **Trash** button to remove the Transfer from the queue.





## Connection Stats

You can click the **Elipsis** button to view the **Connection Stats** or **Connect Details** for the selected connection.



Connection Stats	
Uptime	1 m 48 s
Frame Rate	50.03
Frames Dropped	5
Frames Missed	22
	1 m 47 s
	49.95
	0
Queue	5

### Frames Dropped

This is the number of frames that are dropped at the transmission source. This can happen at the start of a connection, but should not be present during a connection.

### Frames Dropped RX

The number of frames dropped at the destination. This is an indication that the RX queue is overwhelmed by the rate of received frames. Increase the size of the Queue.

### Frames missed

The Tx Endpoint can detect missed frames by comparing the timestamps of the received frames with the advertised frame rate. This is counted accordingly. Outside of connection startup, this should only happen with extremely high frame rates, faulty sources, or extreme network congestion.

### Queue

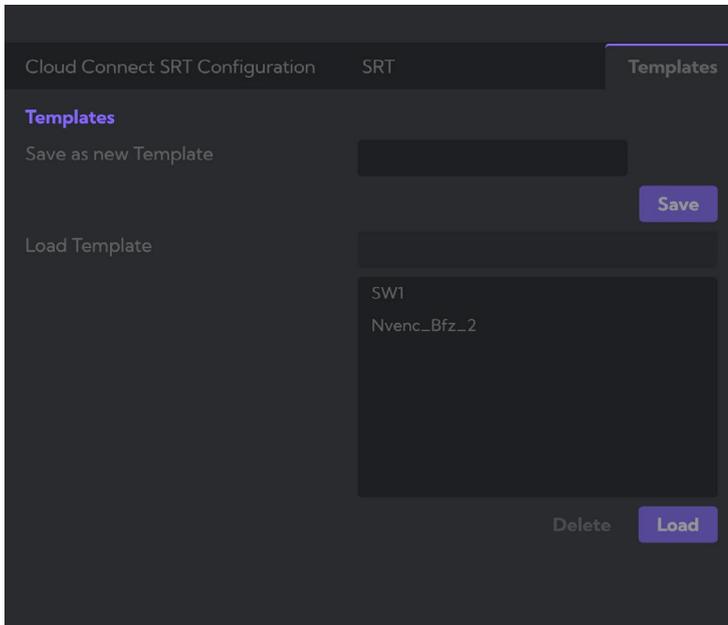
Sets the number of frames in the playback queue.

At the Rx Endpoint, there is a queue (buffer) of frames between the decoder and the next stage (eg. NDI). This is used to smooth over irregularities in the transmission from TX to RX. The **Playback Queue Size** parameter sets the targeted number of frames buffered. Queue length is monitored for 2 seconds after the connection is started, then the playback clock is adjusted to meet the targeted queue length.



## Connection Templates

Connection templates are templates that you can create to preset all aspects of a connection except target endpoint and port. The template can then be used to create future connections without having to manually set up configuration, queue size etc.



- a. Enter a name for the current connection and click the **Save** button. To update a template, simply use the same name as the saved template and you will be prompted to override it.
- b. To load a template, click on the name in the list and click the **Load** button.



## Using Dante Audio

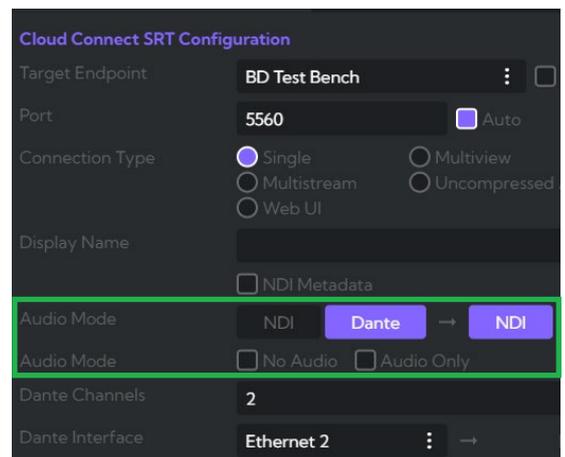
Dante allows enabled devices to transmit audio across a standard IP network and is currently available on SRT and Cloud Connect connections.

1. Set up a connection and choose to use Dante audio.

### Audio Mode

Set the desired Audio Mode. Select the buttons to choose the input and output protocol. When Dante is selected, the Endpoint (TX or RX) will create Dante audio channels in Dante Controller. You can configure the connection to have no audio or only audio.

- For single connections:  
Dante --> Dante, Dante --> NDI, NDI --> Dante.
- For Multistream connections:  
Dante --> NDI.



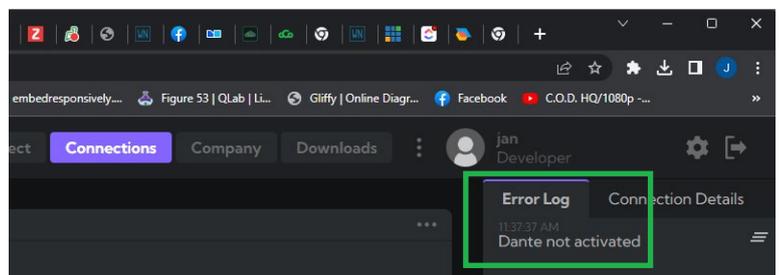
### Dante Channels

Set the number of Dante channels (maximum of 32).

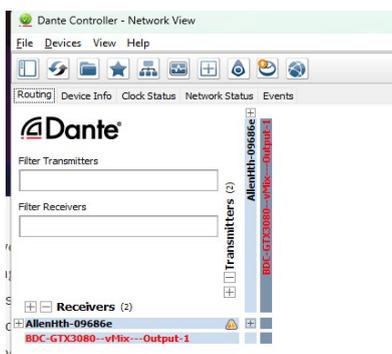
### Dante Interface

Choose the computer's network interface Dante will use to transmit and receive Dante audio.

2. An error message will display informing that Dante is not activated. Cloud will also display an entry in the Error Log.



3. Open **Dante Controller**. Dante Controller software allows you to configure signal routes and other settings. The Dante device associated with the selected interface will be displayed in red, indicating that Dante audio is not activated for that device



4. Click the icon to Launch **Dante Activator**.





A **Dante Ready** device allows you to purchase and add audio channels to a device after initial purchase using the Dante Activator feature in **Dante Controller**. Your device will be discovered, and you will see your purchase options.

Your Dante channels are permanently associated with your device and all routes and settings are stored in the individual Dante devices, allowing them to run without connected computers. Therefore, activations cannot be moved between hardware devices.

The screenshot shows the Dante Controller web interface. On the left is a navigation menu with 'Home', 'Devices' (with a red notification badge '1'), 'Cart', and 'Support'. Below the menu is a 'Log in' button. The main content area is titled 'DEVICE DETAILS' and shows information for 'BDC-GTX3080--vMix---Output-1' (BirdDog - BirdDog Cloud). It includes a 'Channel Options' table with one option: '32 X 32 AUDIO CHANNELS' with properties 'TX: 32 RX: 32' and a price of 'EUR 995.60'. Below this is a 'Summary' section showing 'TOTAL BEFORE TAXES' for 'EUR 0.00'. At the bottom of the interface are two buttons: 'Scan for Devices' and 'Add To Cart'.

Option	Properties	Price
<input type="radio"/> 32 X 32 AUDIO CHANNELS	TX: 32 RX: 32	EUR 995.60

Summary	
TOTAL BEFORE TAXES	EUR 0.00



## Encoder Configuration

Open the Configurations page by clicking **Company** then **Configurations**.

A list of **Encoder Configurations** is displayed. The list shows the company configurations as well as all Global configurations that have been created. Global configurations cannot be edited nor deleted.

You can set compression and video processing settings appropriate to your organisation here and save them as configuration presets that can be used in any connection or recording.

Name	Remarks	Encoder	Bitrate	Bitrate Mode	GOP Size	Profile	Preset	Tune	Recording Type	Encoder Specific
default	10 Mbps, x264	x264	10 Mbps	CBR	12	baseline	ultrafast	zerolateness	auto	
default XS		JPEG XS	100 Mbps	VBR	12	TicoXS High Profile	PSNR optimization		auto	Threads 16
5 MBPS Recording		NVENC (H.264/AVC)	5 Mbps	VBR	120	high	slow		mp4	Psycho Visual Tuning Look-Ahead Max B Frames 3
10 MBPS	NVENC 265 - 10 MBPS - 30 GOP ...	NVENC (H.265/HEVC)	10 Mbps	VBR	30	main10	slow		mp4	Psycho Visual Tuning Look-Ahead Max B Frames 2
5 Mbps   H265   VTB   1	5 Mbps, MBR, GOP 60, main10, U...	VideoToolBox (H.265/HEVC)	5 Mbps	VBR	60	main10	Use hardware		mov	
Low Latency H265	H.265, 15 Mbps, VBR, no PVT, n...	NVENC (H.265/HEVC)	15 Mbps	VBR	30	main10	P1 - fastest (lowest quality)	hq	auto	
10 MBPS   H264   GPU		NVENC (H.264/AVC)	10 Mbps	CBR	12	baseline	P4 - medium (default)	no	auto	
Low Latency CPU		x264	15 Mbps	VBR	30	high	ultrafast	zerolateness	auto	
ProRes HQ Recording		VideoToolBox (ProRes)	10 Mbps	VBR	12	hq	Use software		auto	

## Creating a Configuration

- Create a new configuration by clicking the + button.



- The Create Configuration window is displayed.

Create Configuration

Name

Remarks

Video Encoder

Bitrate  Mbps

Bitrate Mode

GOP Size  Frames

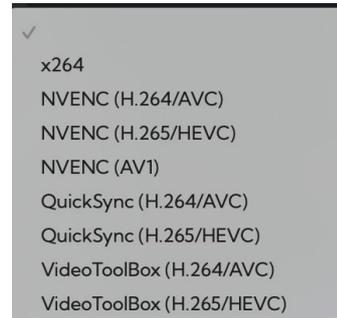
Profile

Preset

Recording Type



- c. Choose the desired Codec (Video Encoder).
  - ProRes is for recording only.
  - NVENC – GPU based encoding, using an Nvidia GPU.
  - QuickSync – GPU based encoding, using an Intel GPU.
  - VideoToolBox – macOS encoder, using CPU and GPU.
  - x264 is pure software based encoding, using CPU only.

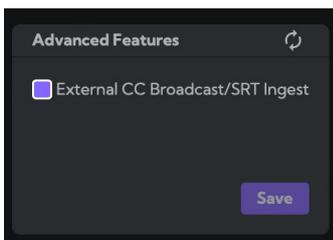


- d. Enter values for the remaining parameters. Different parameters will display specific to the selected codec.

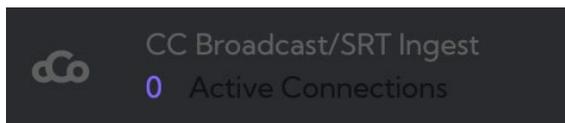
## Cloud Connect Ingest from 3rd Party SRT encoder

SRT ingest is now supported through Cloud Connect, facilitating direct streams to Dolby.io. for one-to-many content distribution. You need to set up an active account with Dolby.io directly.

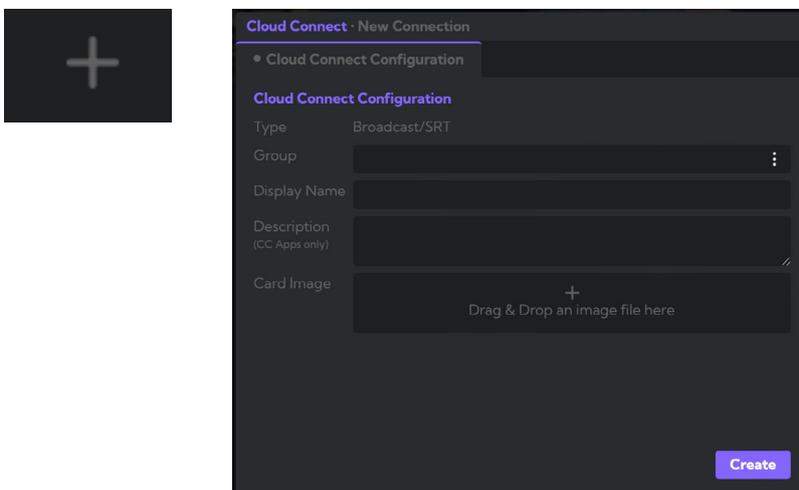
- a. Navigate to **Company** and select the checkbox to turn on the feature.



- b. The endpoints will then display in the connections window.

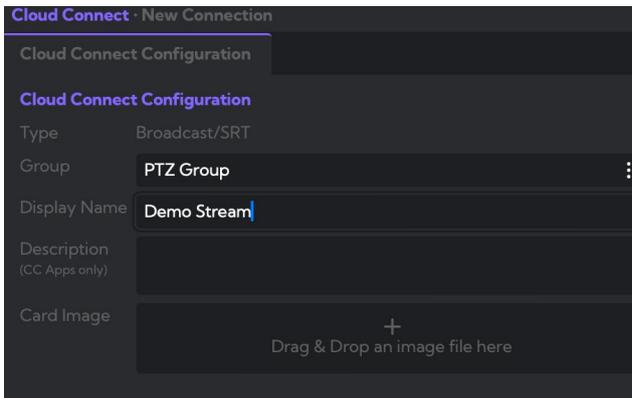


- c. Click the + button to display the **New Connection** window.

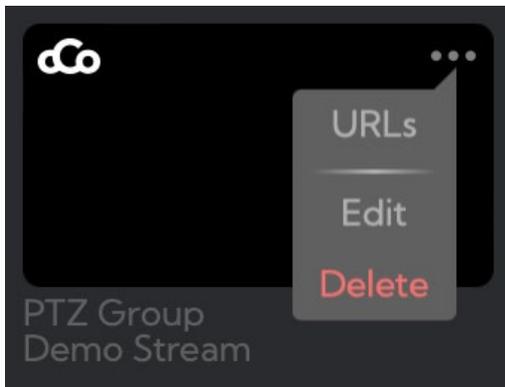




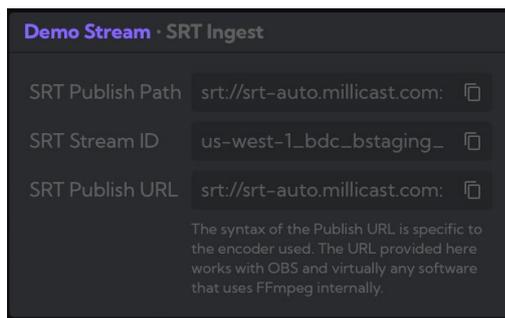
- d. Enter the Group and name.



- e. Click the dropdown to obtain the connection URL.



- f. Use the URL with your own encoder and the virtual stream will be connected once that encoder has been turned on and pointed to that ingest Endpoint.





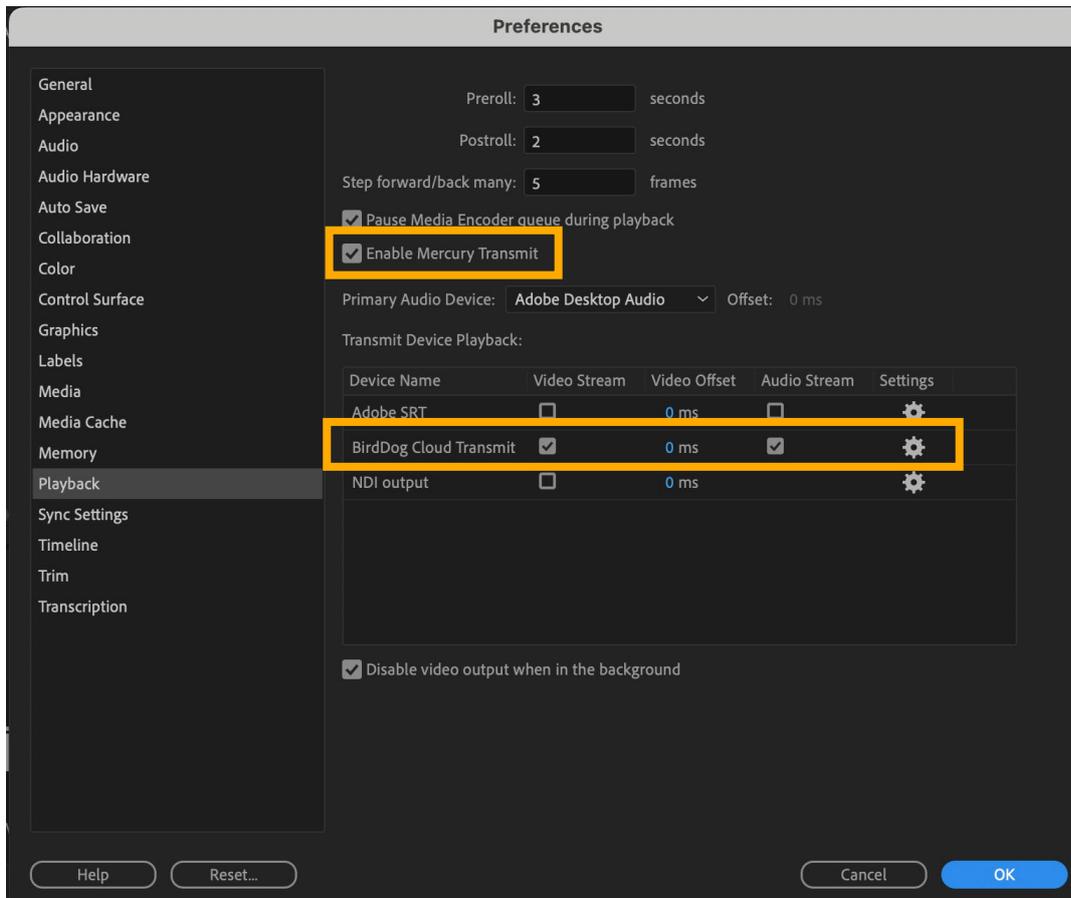
## BirdDog Cloud Transmit Plugin

Mercury Transmit is a software interface that Adobe applications use to send video frames to external video devices. The BirdDog Cloud Transmit plugin enables the video from Mercury Transmit to be sent via BirdDog Cloud.

To install the Mercury transmit plugin you must have Adobe Premier installed. Once installed and you have your Cloud Endpoint running on the same machine, simply right click on the BirdDog Cloud icon in the System tray and select **Install Adobe Premiere Plugin**

### Restart Adobe Premiere

- Enable the **Mercury Transmit** checkbox, this is found under the Adobe Premiere **Preferences Panel**.
- Enable the **BirdDog Cloud Transmit** checkbox (and the **Audio Stream** checkbox, if desired).





# Endpoint Sharing

## Introduction

BirdDog Cloud offers a feature called Endpoint Sharing which enables you to share your studio's Cloud Endpoint with another company's BirdDog Cloud account. This allows for effortless site-to-site remote connections between production companies, fostering collaboration and efficient content sharing. In this guide, we'll explore how to enable and disable endpoint sharing.

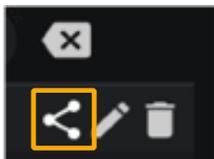
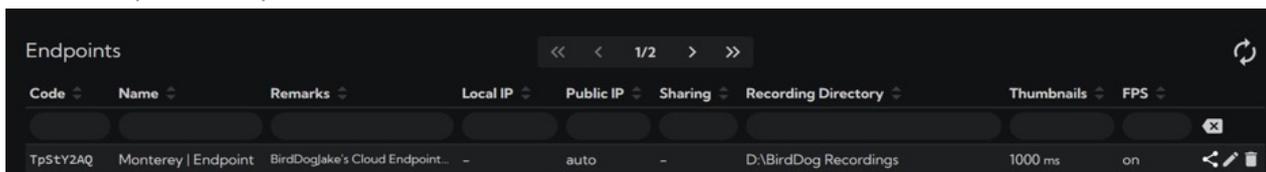
## Step 1: Enabling Endpoint Sharing Access Your Endpoints

Navigate to the Endpoints section in your BirdDog Cloud account. You can access this section using the following link:

<https://app.birddog.cloud/company/endpoints>

## Initiate Sharing

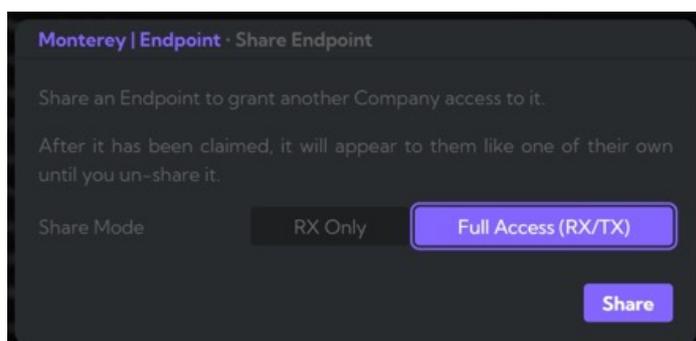
Identify the Endpoint you wish to share with the other account and click on the Share icon located on the right side of the Endpoint entry.



## Choose Sharing Mode

Once the sharing window appears, you can select either RX Only or Full Access (RX/TX).

- RX Only: Enables your Endpoint to be a receiver of the other company's Endpoint sources. They can only transmit from their Endpoint to your Endpoint.
- Full Access (RX/TX): Enables your Endpoint to send its sources and receive from the other company's Endpoints. Streams are bi-directional.



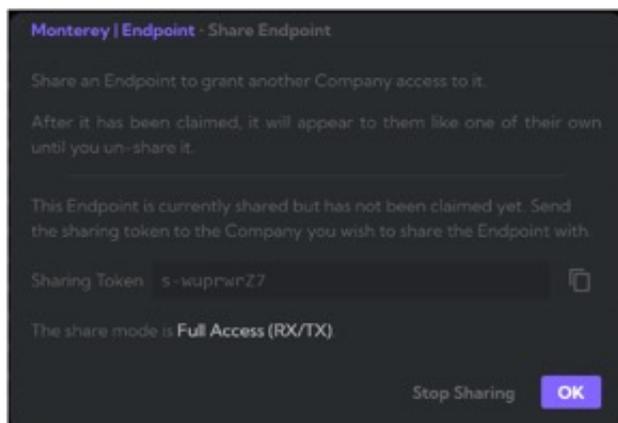


## Obtain the Sharing Token

The sharing process will generate a unique Sharing Token. Copy this token, as you will need it to claim by the other company's BirdDog Cloud account.

## Share with the Other Company

Share the Sharing Token with the other production team. They will use this token to claim the shared endpoint in their BirdDog Cloud account.



## Step 2: Claiming the Shared Endpoint

### Claim the Endpoint

Instruct the other company to use the provided Sharing Token to claim your shared Endpoint using the familiar claim method: <https://app.birddog.cloud/claim>

## Step 3: Disabling Endpoint Sharing

### Access Your Endpoints

If you wish to turn off Endpoint sharing, return to the Endpoints section in your BirdDog Cloud account: <https://app.birddog.cloud/company/endpoints>

### Stop Sharing

Identify the shared endpoint and click on the Share icon. Click Stop Sharing in the sharing window to disable the sharing feature.

### Conclusion

You've now learned how to enable and disable BirdDog Cloud Endpoint Sharing. If you have any questions or require further assistance, please contact the BirdDog support team.

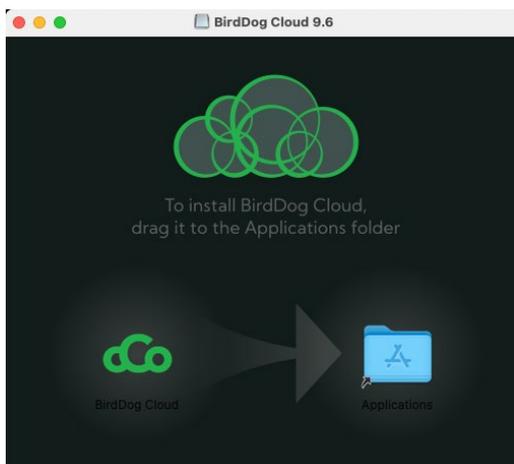


## Appendix

### Mac Installation

**System Requirements:** Installation of the Endpoint software on macOS requires the M1 CPU or above.

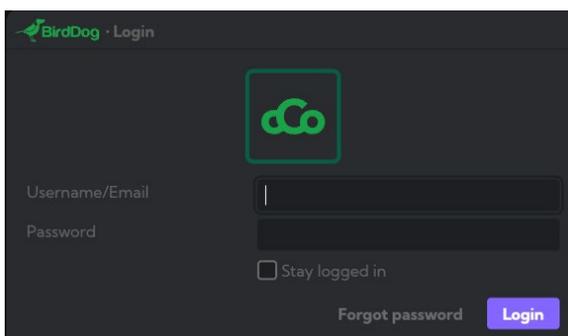
1. Double click the DMG file.
2. Drag the **BirdDog Cloud** icon over to the **Applications** shortcut and release into the displayed **Applications** folder.



3. In the **Applications** folder, double click right click on the installed BirdDog Cloud app.
4. The BirdDog Cloud app is notarised. Click the **Open** button.



5. Log in to Cloud.





6. The **Claim** window displays and you may claim the Endpoint. Please refer to [Getting Started](#) for more information.

**Claim**

When a new instance of the BirdDog Cloud Endpoint software is installed, it automatically registers itself with BirdDog Cloud. To complete the registration, enter the displayed code below to claim it for **BirdDog Australia**.

Someone wants to temporarily give you access to one of their assets? They can provide you with a Sharing Token that is then claimed in the same manner.

## Ubuntu Installation

**NOTE:** Linux operation of BirdDog Cloud is supported only on the Ubuntu 18.04 desktop, and the Endpoint software runs using Mono. Mono is a platform for developing and running cross-platform applications based on the ECMA/ISO Standards. It is a free and open-source implementation of Microsoft's .NET framework.

If you already have the latest version of Mono installed, skip to step 3.

1. If you have an old version of Mono on your linux machine, remove it using the command (this will also automatically remove bird-dog-cloud):

```
sudo apt-get remove mono-devel mono-gac mono-mcs mono-runtime mono-runtime-common mono-runtime-sgen
```

2. Then, install the new version of Mono by running the following commands:

```
sudo apt install gnupg ca-certificates
sudo apt-key adv --keyserver hkp://keyserver.ubuntu.com:80 --recv-keys
3FA7E0328081BFF6A14DA29AA6A19B38D3D831EF
echo "deb https://download.mono-project.com/repo/ubuntu stable-bionic main" | sudo
tee /etc/apt/sources.list.d/mono-official-stable.list
sudo apt update
sudo apt install mono-devel mono-runtime
```

3. Run the following commands (replace the version number as appropriate):

```
sudo dpkg -i birddog-cloud_7.7_all.deb
sudo apt-get install -f
```

4. On a new installation, the Endpoint needs to be claimed. If the claim code does not show up automatically or you missed it, you can display it using this command:

```
sudo -H -u bd-cloud /opt/birddog/birddog_cloud/run.sh --claim
```



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