telestream

LIVE CAPTURE 4.0

User Guide

Vantage 8.2 + Update Pack 3
+ Live Capture ComponentPac 2026.1

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Telestream, LLC
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Nevada City, CA 95959 USA

You can call Telestream during U. S. business hours via telephone at (530) 470-1300.

Server Regulatory Compliance

Electromagnetic Emissions: FCC Part 15 Subpart B, ICES-003, EN 55032, EN/BS 55024, EN/BS EN 55035, EN 61000-3-2, BS EN 61000-3-2, EN 61000-3-3, BS EN 61000-3-3, VCCI-CISPR 32, AS/NZS CISPR 32

Electromagnetic Immunity: EN 55035

Safety: IEC 62368-1, EN 62368-1, CSA C22.2 No. 62368-1-14, UL 62368-1

Additional Country Certifications: NOM, IRAM S-Mark

California Best Management Practices Regulations for Perchlorate Materials:
This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. Perchlorate Material-special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate.

Contact Telestream Customer Service for additional Regulatory Compliance certificates.

Obtaining Support | Information | Assistance

Contact Telestream for support, information or assistance, as indicated below.

Resource	Contact Information
Lightspeed Live Support	Web site: telestream.net/telestream-support/lightspeed-live/support.htm Support Portal: support.telestream.net Support Email: support@telestream.net Terms and times of support services vary, per the terms of your current service contract with Telestream.
All Licensing	Website: telestream.net/telestream-support/lightspeed-live/support.htm License Email: license@telestream.net
Lightspeed Live Information | Assistance | FAQ | Forums | Upgrades	Website: telestream.net/telestream-support/lightspeed-live/support.htm Support Email: support@telestream.net
Telestream, generally	Website: telestream.net Sales and Marketing Email: info@telestream.net
Telestream Reseller Support	If you purchased your product from a reseller, please contact your reseller for support.
International Reseller Support	Website: telestream.net See the website for your regional authorized Telestream reseller.
Telestream Technical Writers	Email: techwriter@telestream.net If you have comments or suggestions about improving this document or other Telestream documents—or if you've discovered an error or omission, please email us.

Return Material Authorization (RMA) Procedure

If your Lightspeed Live Server requires service of any kind, regardless of whether you purchased the Lightspeed Live Server from Telestream or an authorized reseller, contact Telestream directly for a Return Material Authorization (RMA).

Caution: Except for the modular power supplies and disk drives, the Lightspeed Live Server is a sealed device, with no user serviceable parts inside. You should never open the top cover or attempt to upgrade or alter the server. Doing so exposes you to electrical hazard, may damage the unit, and may invalidate your warranty.

Please contact Telestream for all internal service via email: support@telestream.net

Provide your organization name, and contact information, the serial number of the inoperative unit, and request a Return Material Authorization.

Before returning your Lightspeed Live Server, back up the entire contents of all server drives to protect against data loss. See Live Capture Administration Guide > Backing up a Lightspeed Live Server for details.

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Introduction

Telestream's Live Capture is an enterprise-class system hosted on a Lightspeed Live Server platform or as Software Only—on a VM | cloud platform—to deliver real-time, enterprise-class live and tape-based media capture for media and entertainment companies, corporations, government agencies, and educational facilities.

Live Capture is one program in a family of Telestream's Live video recording and playback products: Live Capture, Live Schedule Pro, Tape Capture, and Live Play.

This guide—the Live Capture User Guide—is primarily intended for operators—personnel who are using Live Capture to perform video capture tasks. The companion Live Capture Administration Guide is intended primarily for those who are responsible for setting up, configuring, and managing Live Capture systems. It includes topics on licensing, server installation and updates, plus Live Capture management topics.

Telestream recommends that you read this chapter first, to become familiar with Live Capture.

Note: This guide uses different terms when referring to Live Capture platforms: The term *Lightspeed Live Server* refers to Telestream's high-performance Windows server, whose components are selected specifically to host Live Capture. The term *Live Capture server* refers more broadly on any supported platform hosting Live Capture: Lightspeed Live Server or a VM | cloud platform.

Topics

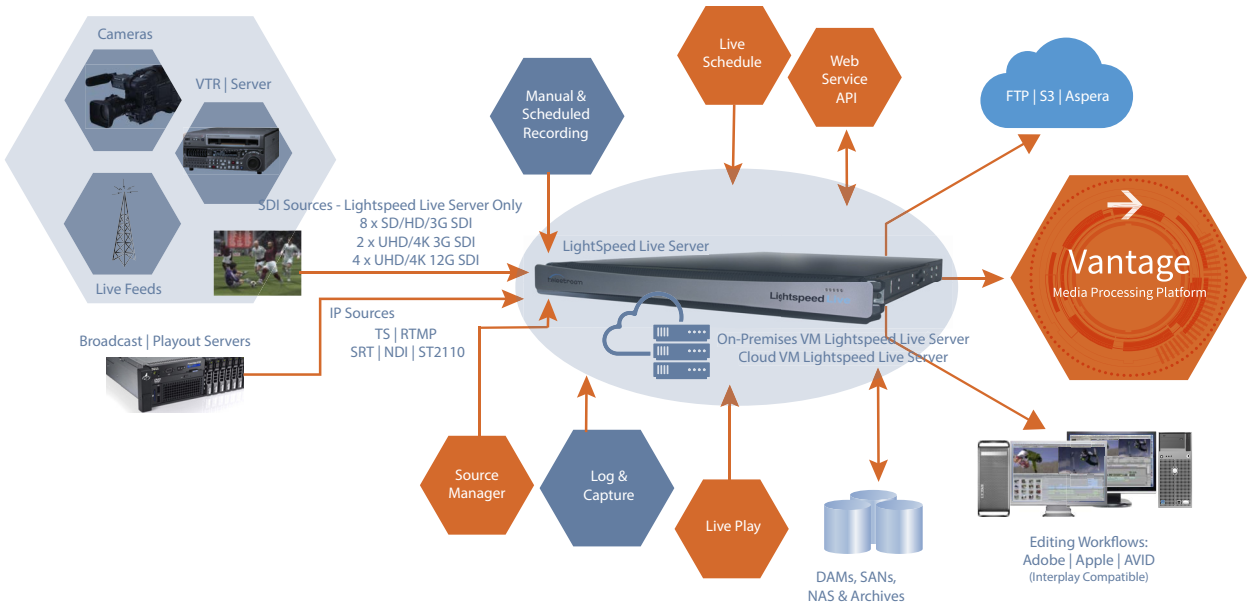
- Live Capture Overview
- Live Capture Web Apps
- SDI Source Video Formats
- SDI Source Audio Formats

Live Capture Overview

Designed for demanding, enterprise-class broadcast and professional video capture applications, Telestream's Live Capture offers premium features and exceptional performance. Live Capture excels at performing demanding video ingest from similar or mixed format sources, while simultaneously capturing and creating multiple high resolution and proxy files from any of its inputs.

Live Capture can also ingest live video streams and stream them back out on your IP network via SRT, for output monitoring or ingest by external systems, both on-prem and cloud-based.

Live Capture is flexible and scalable. Based on Lightspeed Live Server capabilities, Live Capture supports up to sixteen 3G HD-SDI inputs with active loop through for monitoring, or up to four UHD/4K inputs with active loop through for monitoring. When equipped with 12G SDI, Live Capture supports four HD SDI or UHD/4K inputs.



Live Capture also supports IP sources—RTMP, MPEG2 Transport Stream, NDI, and SRT—and ST 2110 (via text / HTML SDP files or NMOS)—when the Lightspeed Live Server is equipped for optional ST 2110 + NMOS support.

Live Capture is capable of capturing up to sixteen concurrent HD streams in select formats and codecs and four UHD/4K formats in select formats and codecs. Live Capture processes video in 16-bit space to preserve source quality and encodes it in multiple video formats, simultaneously creating high-resolution and proxy files in numerous formats. Files are written directly to the Live Capture server's local RAID storage or to external shared NAS | SAN storage, or S3 storage.

Live Capture is configured, operated, and controlled via the Live Capture and Tape Capture web apps. Live Capture APIs are provided for integration and control by other

systems (see Live Capture Administration Guide). Optional editing, scheduling and SDI routing control via RouteMaster, and live playback web apps are also provided.

Live Capture Platforms

Live Capture can be hosted on a Lightspeed Live Server and as Software Only, on virtualized deployments such as VMWare or AWS.

Lightspeed Live Server-based Capture systems provide the highest level of performance and enable you to capture live video via SDI and IP including ST 2110 when so equipped, plus tape-based VTR video. Other platforms enable you to capture live, IP streams and may reduce platform costs.

More Choices, More Flexibility

Live Capture offers a variety of methods to ingest video: 24/7/365 scheduled recording of live feeds, RS-422-controlled VTR tape capture, manual recording including gang control, DAI (SCTE-104) triggering (headless; no operator intervention), recurring segment creation, and automated control through a simple Web Service REST API.

Live Capture encodes captured video into MXF OP1a, QuickTime or Telestream TIFO format. To maintain closed captions and other ancillary data, Live Capture preserves it in MXF, QuickTime, TIFO and Avid proprietary containers.

Media Platform Friendly

Live Capture creates growing files that directly support a wide variety of 3rd party Media Asset Management (MAM) and Non Linear Edit (NLE) solutions including Avid Media Central, Avid Media Composer, Adobe Premiere, DaVinci Resolve, and Apple Final Cut Pro.

Fast, Parallel Open Media Processing

As a standalone system, Live Capture acquires SDI video from independent input channels or through IP connections. You can join multiple Live Capture servers together to create a Live Capture array under a common control interface. In addition, Live Capture is integrated directly with Vantage, enabling unlimited workflow possibilities via Vantage's Telestream Media Framework.

Live Capture workflows support Open workflows to perform transcoding, packaging, and deployment in near real time, as the media is being captured. These media processing workflows complete within seconds following the end of media capture.

You can also deliver Live Capture proxy (secondary) output in HLS | DASH format to Amazon S3 storage during file generation by the Capture action with a Push action immediately following, which only executes in Open mode in conjunction with an upstream Capture action running in Open mode as well.

File-Based Transcoding on Live Capture Servers

File-based transcoding directly on Live Capture servers is an optional, separately licensed feature. Transcoding options enable Vantage file-based transcoding *when not in use capturing media,* enabling you to utilize your Live Capture server for both live video capture and traditional file-based transcoding.

Note: Live Capture is integrated with Vantage Telestream Media Framework for ingesting live, live-linear and tape-based media for serializing media into files for processing in production, post-production and broadcast workflows. In the context of this guide, it is simply referred to as *Vantage*.
If you are performing concurrent ingest and encoding—using Open Workflows (Transcode while Ingest workflows)—you must perform transcoding workflows on a separate Vantage server, not on the Live Capture Server where ingest is executing.

When you're ready to get started, proceed to the *Up and Running Checklist*.

Live Capture Web Apps

Live Capture is comprised of programs implemented as Windows services, and web applications to provide users a graphic interface to utilize Live Capture's features and functionality.

Live Capture includes several client programs implemented as web apps:

- *Live Capture*—The Live Capture Web app (*Capturing Live Media*) is implemented by the Telestream Live Service and enables you to capture live video streams from SDI or from IP-based sources, and save them as files.
- *Tape Capture*—For tape-based media, the Tape Capture web application (*Capturing Tape Media*), which is implemented by the Telestream Live Service, enables you to capture tape-based media, typically in conjunction with a VTR.
- *Source Manager*—Source Manager (*Managing Video Sources*), implemented in the Telestream Live Source Service, enables you to create, configure, and manage all of your video source inputs from a central web app.
- *Group Portal*—The Group Portal web app (*User Administration*) enables you to create users with specific privileges in Source Manager.

SDI Source Video Formats

Live Capture supports the following SDI source formats, at indicated frame rates:

Source Rate	23.98	24	25	29.97	30	50	59.94	60
SD NTSC 525i				■				
SD PAL 625I			■					
HD 720P						■	■	■
HD 1080p	■	■	■	■	■	■	■	■
HD 1080PsF	■	■	■	■	■			
HD 1080i			■	■	■			
UHD 3840x2160P	■	■	■	■	■	■	■	■
4K 4096x2160 Quad link	■	■	■	■	■	■	■	■

* 3G level is detected automatically based on VPID data. Image division must be manually set. In the Source Manager web app, display the Configure Source panel (when Video Mode is specified as QuadLink Video) and set Quad Link Image Division to 2SI. See *Configuring SDI Sources* for details.

SDI Source Audio Formats

- 16-channel 24-bit Little Endian SDI embedded, 48 kHz synchronous

Input Reference

- *SD/HD*—Reference is derived from an internal free-run clock on each SDI input.
- *QuadLink UHD*—Reference is derived from SDI 1.

Output Reference

- *SD/HD*—Reference is derived from internal free run clock or external Bi-Level | Tri-Level (TLS) source. See *Using External Reference (REF) for SDI Monitoring* for details.

Note: All 16 UHD audio channels are provided on SDI 1 and SDI 5 (model-dependent).

Managing your Web Apps

Effective use of your Live Capture web apps requires a supported web browser, learning how to launch each web app and connect to a Live Capture server, and how to use the apps effectively in a networked environment and deal with changes in your network such as changing a Vantage domain name.

Topics

- Web Application Browser Requirements
- Efficient Use of Capture Web Apps
- Launching Live Web Applications
- Launching the Source Manager Web App
- Changing the Vantage Domain Name

Web Application Browser Requirements

Vantage and Live Capture web applications are implemented for execution in Microsoft IIS. Java Script and cookies must be enabled to use Capture web applications properly.

Capture web apps are implemented for viewing in the Chrome browser, version 113.0.5672.93 or greater. Other browsers are not supported. Chrome is installed by default on Live Capture servers and configured to operate properly. Windows is configured to permit Chrome to update automatically.

You can use Chrome on any workstation or other computer, regardless of the operating system, that supports Chrome.

Efficient Use of Capture Web Apps

When a user is logged into the Capture web applications, the web app consumes network and server resource cycles, particularly while viewing multiple channels. When viewed, each channel connects a thumbnail and preview stream to that instance of the web application. Multiple users connected to the web application can degrade its performance. Therefore, care must be taken to ensure that the Live web apps do not consume resources unnecessarily when not being used.

WARNING: Windows IIS allows for a limited set of web socket connections to applications. Over an extended period, if Capture web apps are opened in multiple browsers, the web server and browser may exceed the connection limit. This results in thumbnails and previews not displaying in the web apps. To avoid this situation, close any browser connected to the Live Capture Portal that are not being used.

Launching Live Web Applications

Note: This topic applies to all Live web apps except the Source Manager web app. For details on launching Source Manager, see *Managing Video Sources*.

Most Live web apps are launched from Vantage's web portal, which requires logging in to Vantage. Logging in to a Vantage domain from a web application is a bit different than logging in from a Vantage Windows client application, such as Workflow Designer.

Starting Live Capture | Tape Capture

To start Live Capture | Tape Capture web applications (or other Vantage client web apps), do the following:

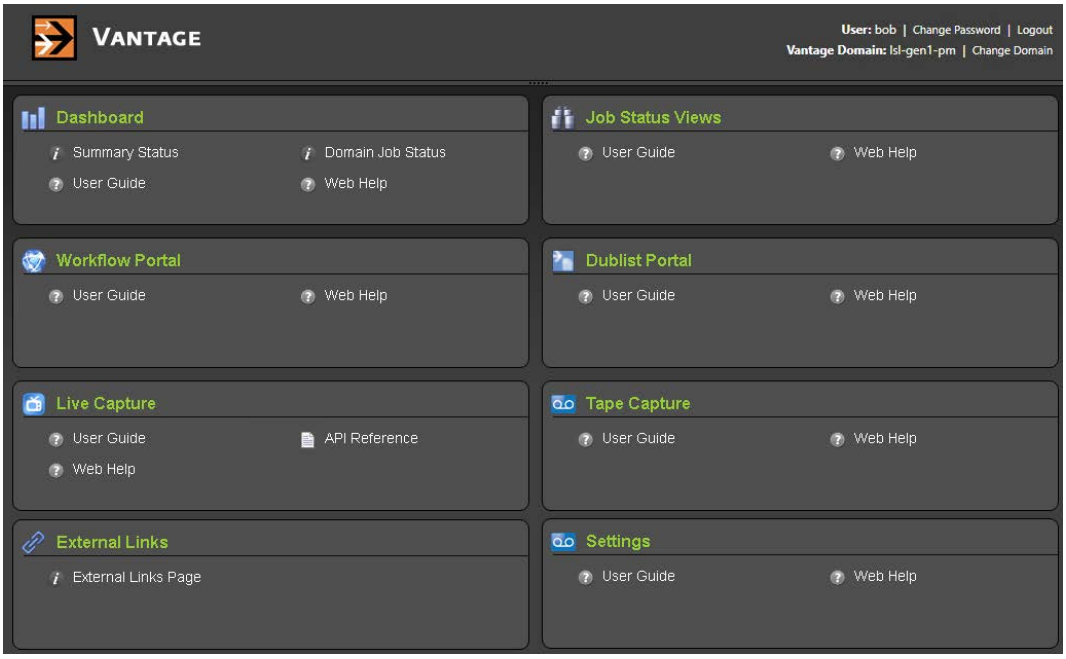
1. Display the Vantage web portal—open Chrome and enter one of these URLs:

   http://`<IISServerName>`*/Vantage* where `<IISServerName>` is the DNS name of the IIS server—by default, the same as the Vantage domain server

   OR

   If you're running Chrome directly on the server which hosts Vantage, enter *http://localhost/Vantage*.

   Vantage displays its web portal (also referred to as the Vantage home page).



Note: If you don't know your Vantage domain's server name (by default, the server where the Vantage domain database is hosted), contact your Vantage administrator / IT department.

2. Click on the panel for the web app you want to launch.
3. If you're prompted to log in to Vantage, enter your credentials.

Note: If you' re not authorized to log in, contact your Vantage domain administrator.

The apps that display in the Vantage web portal vary depending on your licenses. Click the web app you want to use.

Note: If you are logging into a web app from another workstation on the network, you may encounter a connection error: *No client connection to Live server*. Clear your browser cache and retry, determine if the Vantage Live Service is running and accessible, or go to *http://*`<host name>`*/Vantage* to display the Vantage web portal, and launch your web app there. Also, verify that the web app's port isn't blocked by a firewall (see *Live Capture Administration Guide* > *Firewalls and Blocked Ports Limit Functionality*).

Launching the Source Manager Web App

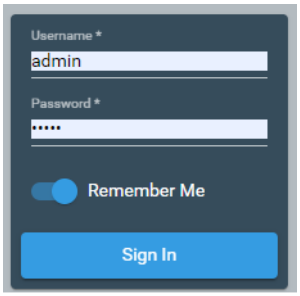
The Source Manager web app (see *Managing Video Sources*) is installed on every Live Capture server.

To start the Source Manager web app and log in, enter *http://localhost:8090/* | *http://* `<Remote host name>` *:8090/* in your Chrome browser.

Note: Unlike Capture, Tape, and other web apps, Source Manager does not utilize the Vantage web portal (*Launching Live Web Applications*) for launching or for managing user credentials. You can modify Source Manager user credentials using the Group Portal (see *User Administration*).

When you are accessing Source Manager locally (Chrome is running on the same Live Capture server as Telestream Live Source Service), use the keyword *localhost*. If you are accessing Source Manager remotely (Chrome is running on a computer that is not a Live Capture server), use the Live Capture server's host name.

Source Manager displays the login panel:



Enter your user name and password. The default user name and password is *admin/live!*. Users are defined using the Groups Portal web app (see *User Administration*).

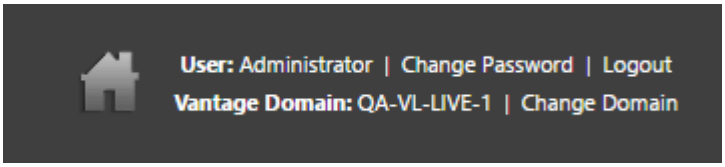
Logging Out of Source Manager

To log out of Source Manager, click the User icon in the toolbar at the top right corner of the window at the far right edge of the Source Manager title bar. Source Manager logs you out and immediately displays the Log In panel.

To log back in, enter your user name and password. The default user name is *admin* and the default password is *live!*, and it can not be altered. You can create additional users in the Group portal (see *User Administration*).

Changing the Vantage Domain Name

If you have changed your Vantage server's host name (by default, it is used to name your Vantage domain), you should verify that the Live Capture web application is using the new domain name. The currently-connected domain name displays in the upper right corner of the web app:



If it is not connected to the correct domain, change the domain with these steps:

1. Click on *Change Domain*.
2. Click OK to log out.
3. Click Search in the dialog that displays.
4. Select the correct domain, and click OK.
5. Enter the user name and password to log into the target domain.

Capturing Live Media

The Live Capture web application enables you to set up and configure SDI and IP-based sources and channels to capture live video streams dynamically, via event schedules, triggers, or by gang recording.

Live Capture web application also provides real time data, content previews, status information on capture operations as well as overall system robustness. You can also use the Vantage Job Status Views web app to monitor capture jobs.

Topics

- Using the Live Capture Web App
- Using Triggers to Control Channel Recording
- Recorded File Formats and Locations
- Using the Vantage Job Status Views Web App
- Configuring System Health Settings

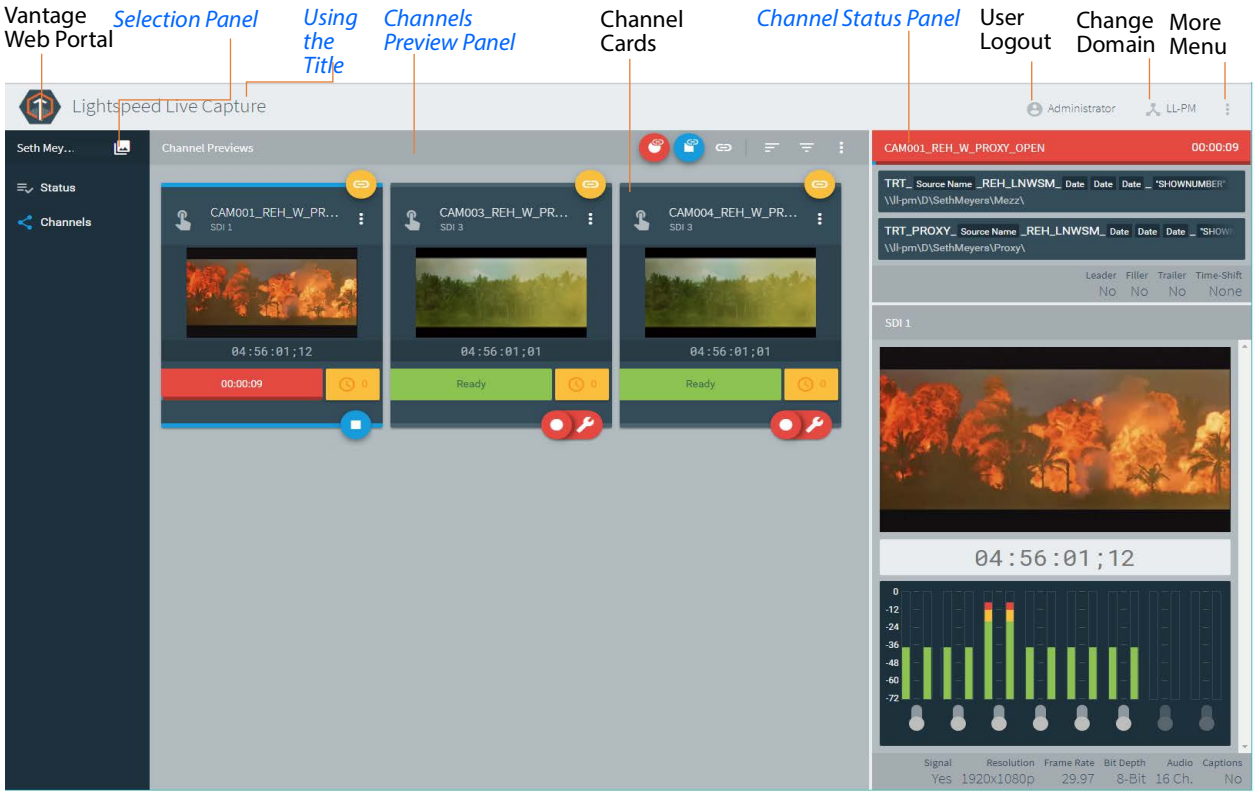
Note: For details on launching web apps and other general web app topics, see *Managing your Web Apps*.

Using the Live Capture Web App

These are the key tasks you perform in the Live Capture web app:

- Configure and manage channels: information, previews, and status
- Monitor a channel group's status
- Configure labels, variables, and recordings
- Start and stop channel recording. Control the operation of each channel manually by an operator or automatically—via web services, SCTE-104 (automatic—no operator intervention), Live Schedule Pro, or recurring segment triggers.
- Notify operator of high resource consumption that may require attention

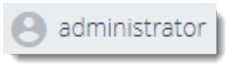
This figure represents a typical Live Capture web app interface—a panel selector to the left, the center Channel Preview panel with a selected channel (at left—note the blue bars, top and bottom), and its video stream with details to the right:



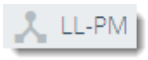
Using the Title Bar

The title bar at the top of the Live Capture web app provides these buttons:

Home—Click to open the Vantage web applications menu.



User Name—Displays the current user name. Click and select Log Out if you want to log in as a different user.



Vantage Domain—Displays the Vantage domain to which you are connected. Click and select Change Domain to open the dialog to select a different Vantage domain.

More Menu—Displays these panels:

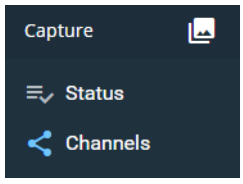
Notifications—Displays the Notification Settings panel, where you control and configure Live Capture notification functionality to suit your requirements (see *Configuring System Health Settings*).

Preferences—Displays the Preferences dialog, where you can set up recording confirmation preferences (see *Setting Recording Confirmation Preferences*).

About—Displays the Vantage Live Capture panel, and links to the user guide (this document), and application and support information.

Selection Panel

The Selection panel—on the left edge of the window—where you can select among your channel groups, and view capture status, and channels.



Channel Groups—Click Channel Groups to select a group from the list of available channel groups. Channel groups are helpful to filter channels by category when you have a lot of them. This is the first selection you must make. See Live Capture Administration Guide > In the Vantage Management Console... to create at least one Channel Group, where they are referred to as a *nexus*.

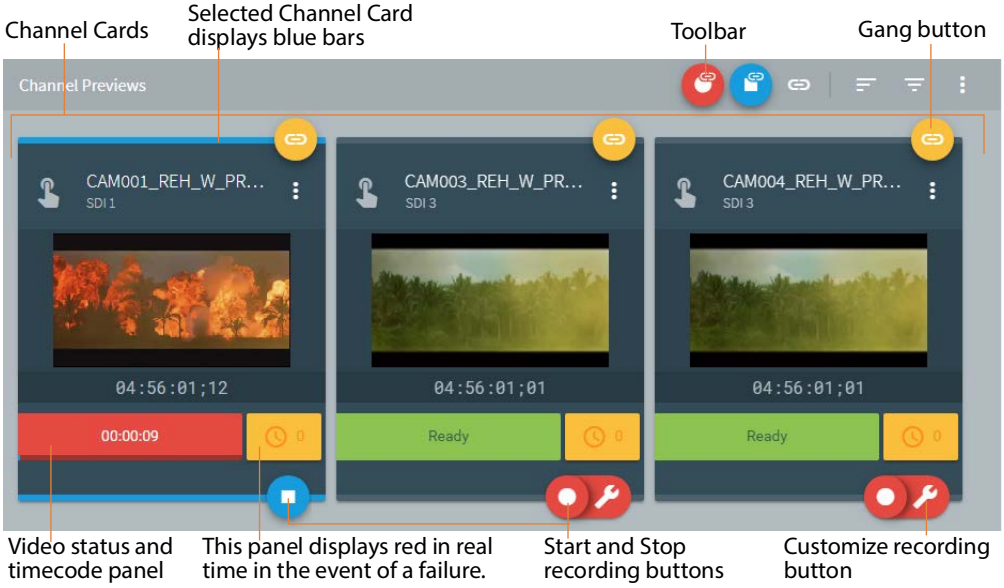
Status—Click Status to display the Job Status panel, which shows the status and jobs of all active workflows contained in the selected channel group. (See *Channel Status Panel*).

Channels—Click Channels to display the Channel Previews and Display panels (see Channels Preview Panel, following).

Channels Preview Panel

When you select Channels, the Channel Previews panel displays a thumbnail of each video stream on a channel card. One channel card is displayed for each active Live Capture workflow. Information, settings, and options are presented that are specified in each workflow.

- The selected channel card, indicated by blue bars on the top and bottom, plays in the Display and Information panel to the right.
- Use the toolbar and menus to control channel ganging—triggering multiple recordings at once, channel filtering, and recording settings.
- Each channel displays a channel name and displays a thumbnail of incoming video.
- Each channel displays a gray trigger type, a yellow gang/ungang button, a red and green Recording | Ready (Stopped) bar, and a yellow queued job bar.
- The More menu provides access to panels for each channel.
- The bottom right corner displays Record/Stop and Record Options buttons for one-button recording and easy access to recording settings.



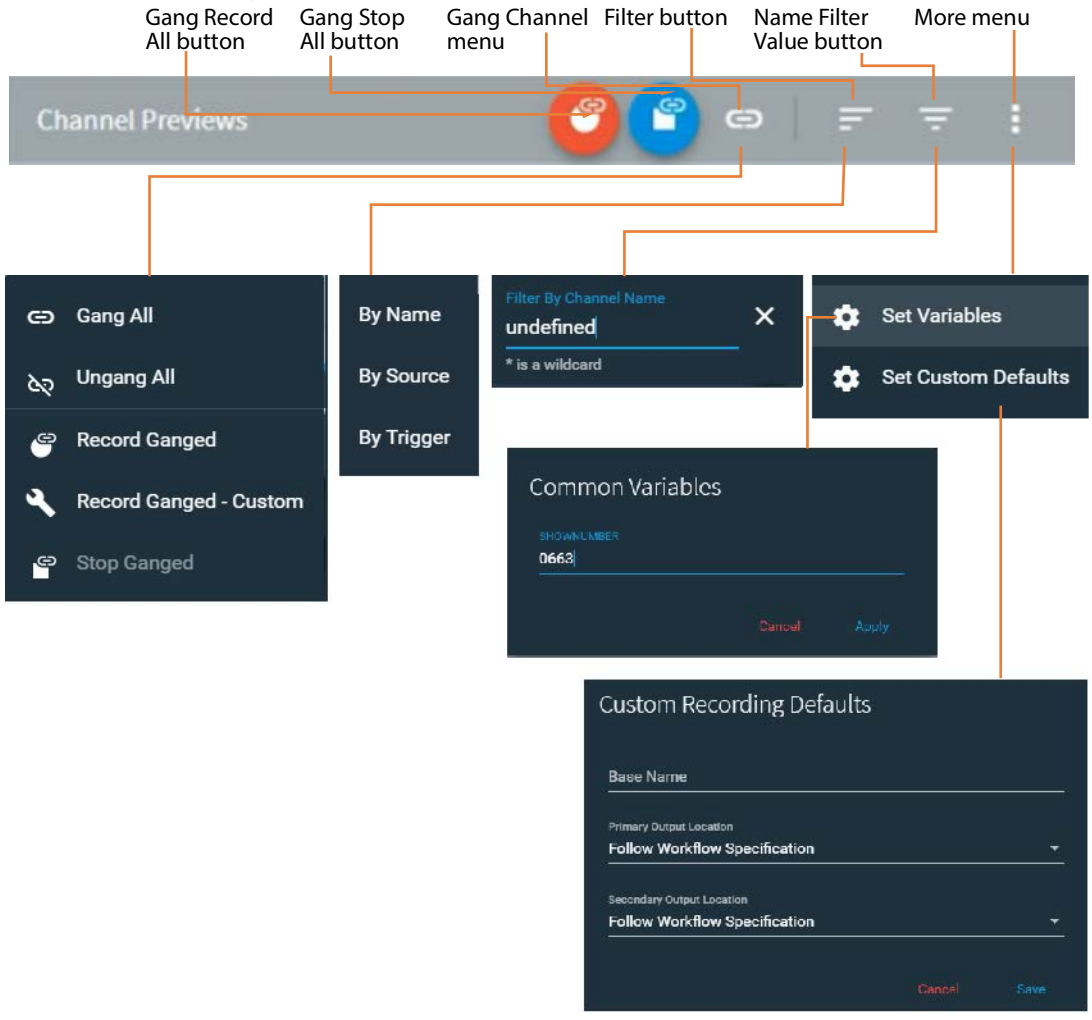
Channel Previews panel components and their operation are described in detail here:

Topics

- Channel Previews Toolbar
- Configuring Single-Channel and Custom-Ganged Recording
- Channel Card Details | Status | Controls
- Channel Options
- Viewing a Channel's Recordings History
- Channel Display and Information Panel
- Loss of Signal Behavior
- Limited Bandwidth Behavior

Channel Previews Toolbar

The Channel Previews toolbar displays several icons, each of which displays a set of commands or settings:



Record All—Click *Record All* to record the currently-ganged channels. Record All operates in two different modes depending on whether time-shift has been enabled in the workflow. (See the Capture action help topic for details about time-shift.) Frame-accurate gang recording may not be not reliable without using time-shift.

Effect of time-shifting for manual trigger workflows (does not apply to recurring segment workflows):

- **When Time-Shift is disabled** in the workflow, all channels start recording immediately with no attempt to synchronize the start timecode.
- **When Time-Shift is enabled** in the workflow, the system attempts to synchronize all of the selected channels to the same start timecode before starting recording. When recording starts, some portion of the frames in the time-shift buffer are added to the start of the recorded file (going back in time to included frames from the past). As a rule, add 10 seconds of time-shift for each ganged channel. For example, in a group capturing 12 channels (4 per server) each channel should be given 10 seconds of time shift (4 channels X 10 seconds per channel = 40 seconds per server). Buffer limits vary based on server, RAM, and media metrics. See Live Capture Administration Guide > Determining the Time-Shift Buffer Duration for details.

Caution: When you are gang recording with Time-Shift, you should configure all channels with a valid timecode, connected to inputs with identical frame rates and set to the same timecode source. Otherwise, channels may fail to start.

Stop All—Click *Stop All* to immediately stop recording all ganged channels in the channel group that have not been filtered out.

Gang Record menu—Select *Gang Record* to display a panel in which you can control gang recording. Gang recording allows you to trigger recording on multiple channels simultaneously without necessarily triggering all channels.

Use this menu to turn gang recording on or off for all channels (Gang All/Ungang All), start/stop gang recording (Record Ganged), and set up customized gang recording to specify which channels are ganged (Record Ganged Custom).

Frame-accurate gang recording is not reliable until you have a time shift of at least 10 seconds applied to a channel, 15 seconds is better.

See *Record All* above for details about how Time-Shift affects gang recording.

Sort—Sort channel cards by Name | Source | Trigger. You can also drag & drop channels.

Filter—Filter by typing portions of the workflow name to see only the channels that contain the typed characters. Use * as a wildcard character.

Channel Previews More menu—Displays dialogs for variables and custom recording default settings.

Select Set Variables to set common variables for all channels. For example if you set a bound variable in Set Variables, the value for that variable is used in every recorded channel it is associated with, except when explicitly set in a workflow's Variable dialog.

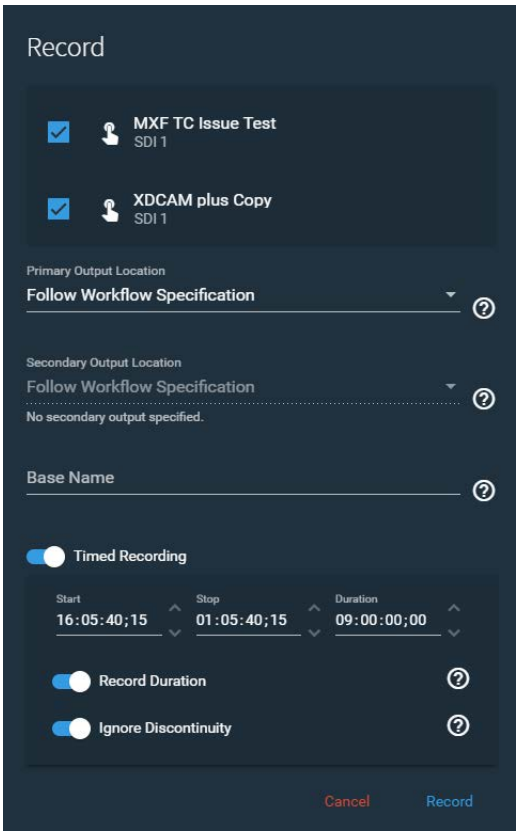
Select Set Custom Defaults to specify a default base name for all channel files, and default global primary and secondary output locations.

Values entered and saved in the Global Metadata menu are persisted in memory as long as the browser remains open. If no persisted value is present (for example, a new variable is assigned to a workflow that has just been activated), the default value configured in the Vantage Management Console is used.

Note: Variable and label data entered while a channel is in the waiting state are applied to a job at the time the job is queued for recording. Variable and label data entered while a job is in a recording or pending state is applied to the next job queued.

Configuring Single-Channel and Custom-Ganged Recording

Click Record Ganged - Custom or click the Custom Record button on the target channel to display the Record dialog and optionally, select which channels to include in the record operation and the settings to use for all channels.



Channel Name(s)—For each Manual or Recurring Segment Trigger, displays the name of the workflow channel and the name of the input for that channel. The channels—for ganged recording—that are checked are included in the record operation.

Primary Output Location—Select a Vantage folder address book entry for the Primary output destination or use the default location specified in the Capture action workflow.

Secondary Output Location—Select a Vantage folder address book entry for the destination of the secondary output, or use the default location specified in the Capture action workflow. The secondary output must be enabled in the Capture action for each channel included in the record operation for this to be active.

Base Name—Enter a name for the Base Name token. This name displays in the job name and is only used in the output media filename pattern when the Base Name token is added in the Filename Pattern Editor in the Capture action for this channel. The Base Name entered is applied to all channels selected for recording. To add the Base Name token, see *Configuring Primary and Secondary Outputs*.

Timed Recording—Enable Timed Recording so you can set start, stop, and duration times and options. Timed Recording is not active for channels configured to use *Using Recurring Segment Triggers*.

- **Start** (Timecode)—If all selected channels have a common timecode, the values of Start are automatically entered. You may enter any desired timecode.

  Setting Start Timecode to a value that is less than 60 seconds in the past results in a recording starting immediately. For example, if the current timecode is 02:30:00;20 and a start timecode of 02:30:00;18 is used in the job, recording begins immediately at the current timecode of 02:30:00;20.

  Setting Start Timecode to a value that is more than 60 seconds in the past results in a job to be scheduled for recording in 24 hours. For example, if the current timecode is 02:30:00;20 and a start timecode of 02:29:00;18 is used, recording begins at 02:29:00;18 the next day (nearly 24 hours later).
- **Stop** (Timecode)—Specifies the timecode when recording should stop.
- **Duration**—When you enter a *Start* and *Stop* timecode, the resulting duration is automatically displayed. When Record Duration (see below) is enabled, the duration entered here is used.
- **Record Duration**—When enabled, recording ignores the *Stop* timecode and stops when the *Duration* you specify is reached. When disabled, recording stops when the *Stop* timecode is reached; the Mark-OUT frame isn't included in the file.
- **Ignore Discontinuity**—When Ignore Discontinuity is enabled, recording ignores any timecode discontinuity if detected. When not enabled, recording stops when a timecode discontinuity is detected. See *Timecode Break Recording* for details.

Caution: When you enable Ignore Discontinuity, Live Capture suppresses time code errors—they are not displayed in the web app to alert you of a potential problem. If there are time code discontinuities on the tape, recording continues without interruption or warning.

Using Cue Mode

Cue mode allows for fast starting of synchronous ganged crash or timed recordings. Configure cue mode in the Custom Record Settings panel in the Capture user interface.

The following settings are persisted when a channel is set to cue mode:

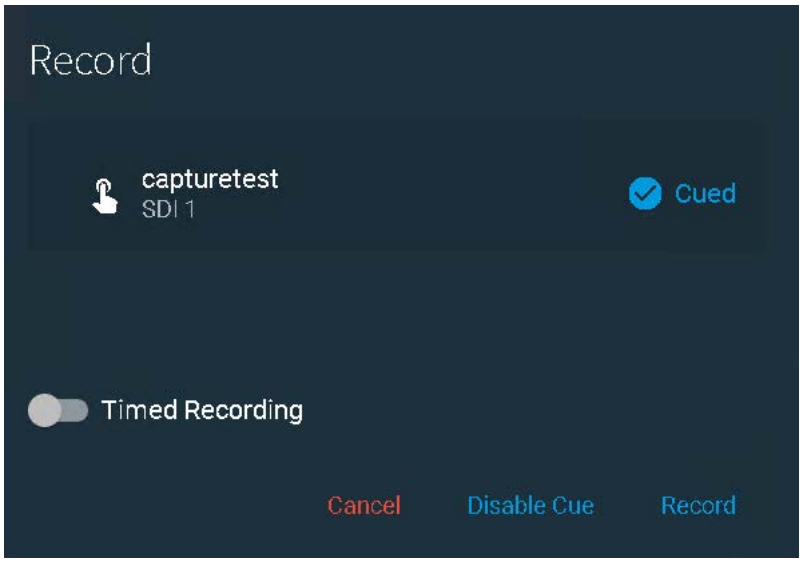
- Base Name for the recording (if provided)
- Primary output location
- Secondary output location

You can either start a crash recording directly using the Record button on the channel thumbnail, or create a crash or timed recording from the Custom Record Settings panel.

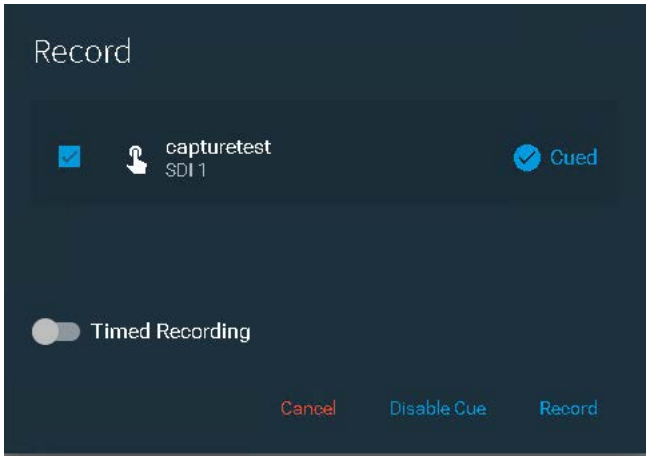
Cue mode takes approximately 5 seconds per channel to initialize. While the cue mode is initializing, the channel thumbnail hides the record option controls and record button, and status is displayed as Cueing.

While a channel is cuing, you can not change settings for that channel. When the channel is cued and ready to start, the record and record options buttons become available again.

To disable cue mode for an individual channel, open the Recording Options for the channel and select Disable Cue for each cued channel.



For ganged recordings, checking the Record Ganged - Custom option allows the same functionality.

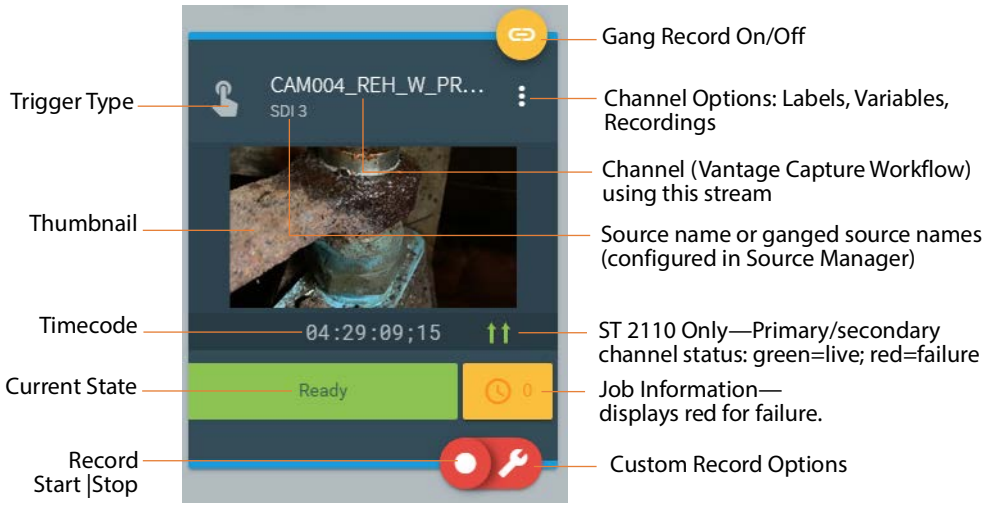


Note that in the Capture action, a workflow is set by default to Auto-Recue after a recording completes. If Auto-Recue is not enabled, you need to recue the channel after every recording.

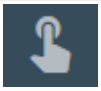
Channel Card Details | Status | Controls

Channel cards (which are displayed on the *Channels Preview Panel*) provide details and controls for each channel that has an active workflow. For SDI input, format mismatches are identified.

Here is a typical depiction:



Trigger Type—Icon indicates the type of trigger that controls the channel:

Icon	Trigger Type
	Manual Trigger
	DAI (Dynamic Ad Insertion) Trigger
	CalDAV Calendar Trigger
	Web Service Trigger
	Recurring Segment Trigger

Name—Shows the source name.

Thumbnail—Displays a still image of the channel input, updating about once every 3-5 seconds (depending on server usage load).

Timecode—Displays the current channel timecode.

 **Gang Recording**—Toggles gang recording for the channel. Yellow indicates it is on, and gray is off. You can only use channels configured with Manual | Recurring Segment | Web Service (when Manual Override is enabled) triggers in gang recording.

Current State—Indicates the current channel recording state by color and message:

- **Green**—Indicates the channel is ready to record, with a message of *Ready* (Manual, Recurring Segment, and DAI), *Listening*... (Web Service), or *Awaiting*... (CalDAV Calendar).
- **Yellow**—In a transition state and preparing to record or stop. For SRT streams, a message of *Connecting* or *Connected* indicates the status.
- **Red**—Recording is occurring. The elapsed duration of the recording is displayed. A blue progress bar indicates the current recording progress.

 **Channel Options**—Opens the Channel Options menu. See *Channel Options*.

 **Queued Job Information**—Displays in yellow; the number displayed indicates how many jobs are queued to start. Click to display the Recordings panel, which displays information about the current, queued, and previous recordings. See *Viewing a Channel's Recordings History*.

 **Failed Job Information**—Displays in red when the associated job has failed due to a downstream error condition. Remains red until a new job is started; the number displayed indicates how many jobs are queued to start. Click to display the Recordings panel, which displays information about the current, queued, and previous recordings. See *Viewing a Channel's Recordings History*.

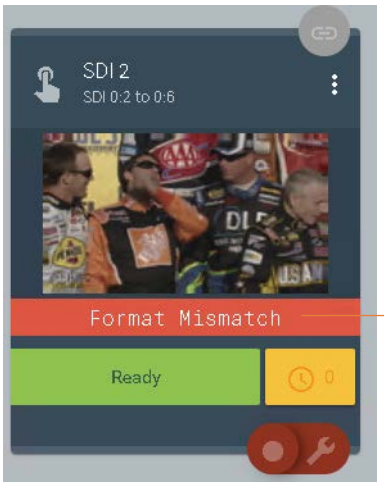
 **Record/Stop**—Click Record to start recording for the channel. If recording confirmation is enabled (*Setting Recording Confirmation Preferences*), Live Capture displays a confirmation dialog. When recording, click Stop to end recording. If you are using Live Schedule Pro, you can also start recording an event in the Live Schedule Pro event calendar—click on the event's start icon (see *Live Schedule Pro User Guide* > *Starting an Event Immediately*).

Note: In Live Capture SW, if you have more than one active Capture workflow with a single Live Capture Software Only license (see *Live Capture Administration Guide* > *Software Only Licensing*), you can't start recording. Only activate one Capture workflow or obtain more licenses.

 **Record Options**—Click Record Options to display the Record Options panel for the channel. See *Configuring Single-Channel and Custom-Ganged Recording*.

SDI Format Mismatches—When you've configured your Capture workflow to restrict SDI input to a specific frame type and rate (for example, 1080i@29.97), Live Capture

alerts you to a source video format mismatch by displaying a red banner on the channel card, with the text *Format Mismatch*:

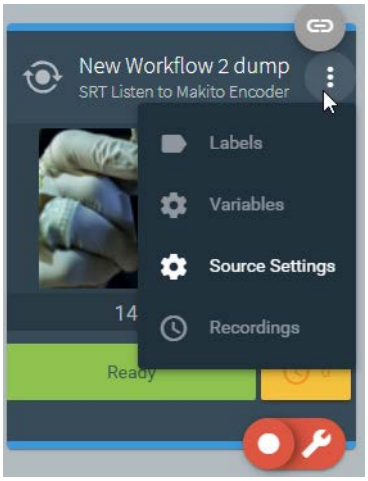


For details about configuring the Restrict Input control in Live Capture, see the Capture action man page in Workflow Designer.

Resolve the mismatch to restore event processing, as appropriate.

Channel Options

Select the More ⋮ menu on a channel card to select the task you want to perform:



Modifying Label Values

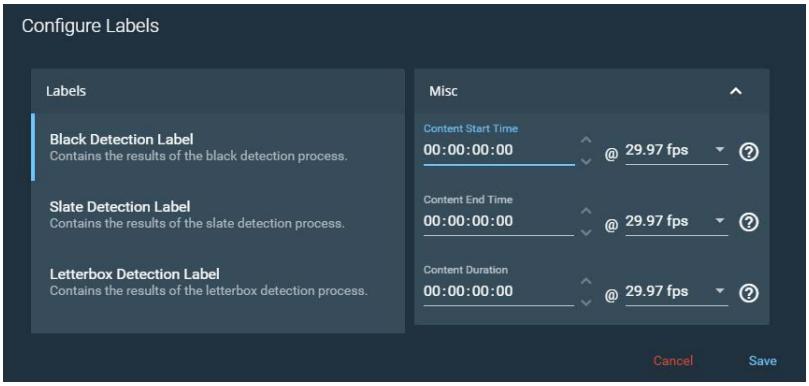
When you are using labels in the Capture workflow for the channel, click Labels to display the Configure Labels panel and modify the workflow label's settings.

The definition and contents of labels depends on the metadata labels you create and define in the Vantage Management Console and enable in the Capture action. You can use labels in downstream Vantage actions or transformed into text or XML for out-of-band delivery. To add labels to a Capture action, see *Expected Labels*.

Note: If you modify label parameters in the Vantage Management Console, the changes must be applied to the workflow's Capture action so that they are updated in the Live Capture web app.
To apply label updates:

1. Put the workflow into edit mode and open the Capture action inspector.
2. In Expected Labels, disable the target label(s); then re-enable them.
3. Save the action and re-activate the workflow.

Now, the updated label(s) displays the correct information in Live Capture.

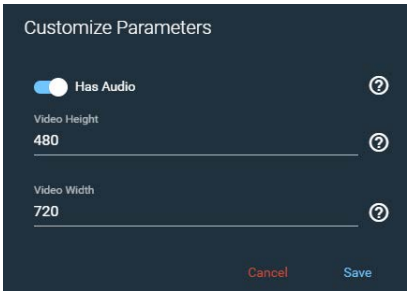


Note: Variable and label data entered while a channel is in the waiting state are applied at the time the job is queued for recording. Variable and label data entered while a job is in a recording or pending state are applied to the next job queued.

Modifying Variable Values

When you are using variables in the Capture workflow for the channel, click Variables to display the Customize Parameters panel and modify the workflow's variable values.

Configuration parameters bound to variables during Capture action setup or via the Add Variables menu in the Capture action are displayed in the Customize Parameters panel. You can turn selected variables on or off, enter configuration variables or adjust specific settings.

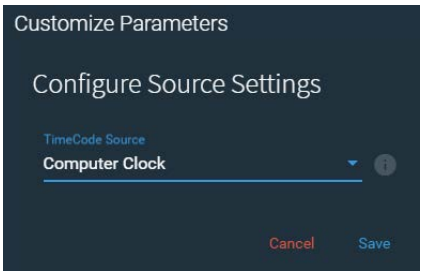


Any variable values entered and saved are persisted in memory as long as the browser remains open. If no persisted value is present (for example, a new variable is assigned to a workflow that has just been activated), the default value configured in the Vantage Management Console is used.

Note: All variable values are passed to downstream workflow actions where they can be analyzed or used in your entire workflow.

Modifying Source Settings

In addition to setting the timecode source for a channel when you're configuring it in Source Manager, you can also set it here on its channel card:



Timecode Source—Click the menu to choose one of the following timecode source signals for the selected SDI input:

- *Source*—Uses the timecode provided in VBI or VANC (SMPTE 12M-2/RP188) of the selected Live Capture's video input signal. If a valid timecode is not available or goes away, see the Free Run Timecode option below.
- *Computer Clock*—Uses the time-of-day clock provided by the Live Capture server. When selected, also configure Compensate for Computer Clock Drift.

WARNING: If video and timecode are not synchronized to the same reference, time code discontinuities can occur. To avoid time code anomalies such as unexpected discontinuities and repeated time codes, always sync the incoming SDI signal and timecode to the same genlock (reference) source. Failure to do so can cause recording that stop abruptly or do not stop as expected.

Caution: If your Live Capture server's Time Zone Setting is set to a time zone that does not have Daylight Savings Time, computer clock use UTC time, due to a Windows limitation.

- *None*—Specifies zero-based timecode recording. When recording begins, the timecode is set to 00:00:00:00. If Free Run Timecode is enabled, then the timecode inserted into a QuickTime or MXF file auto-increments. Otherwise, every frame in the output file contains timecode 00:00:00:00. Capture displays N/A on the workflow thumbnail, indicating that there is no applicable timecode available, and 00:00:00:00 displays in Capture's Preview timecode window.
- *Analog LTC*—Uses the timecode provided on the SDI card's LTC input (marked with an R on the SDI card). If a valid timecode is not available or goes away, see the Free Run Timecode option below.

Note: Analog LTC timecode is passed to Live Capture in input frame samples from the SDI card. When a channel is in an LOS state, the LTC timecode is not present and is passed to Live Capture at 00:00:00:00 until a valid signal is present on the input.

- *RS422*—Uses the timecode provided by a VTR connected via RS422 (requires the optional 4-port or 8-port RS422 VTR Interface Kit—see Live Capture Administration Guide > Connecting VTR Systems). If an input is connected to a VTR under RS422 control, RS422 must be selected.

Note: When using the CalDAV Calendar trigger you should set the Timecode Source to either Computer Clock or Source. When using Source, you must have time-of-day timecode in your source that matches the time set in your Live Capture server.
See *Configuring Trigger Settings*.

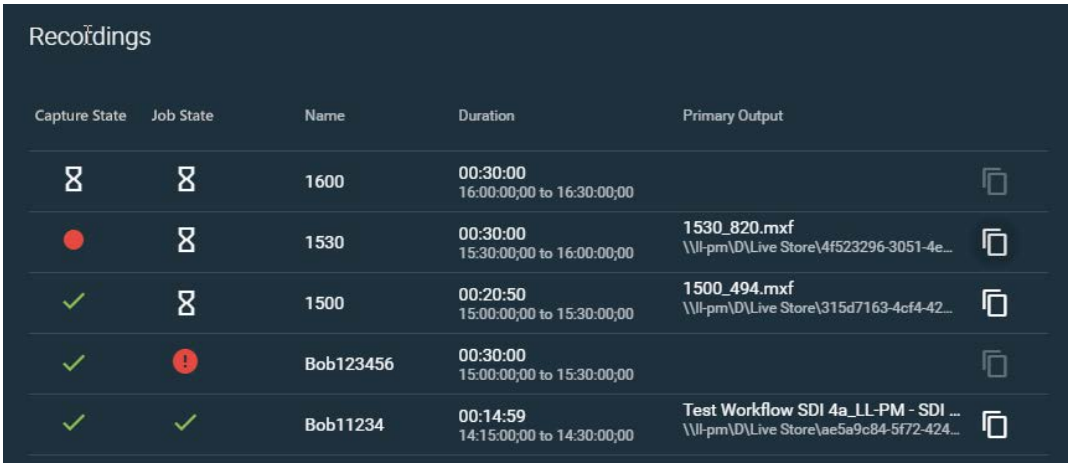
Viewing a Channel's Recordings History

Click Recordings to display the Recordings panel, which displays information about the current, queued, and previous recordings.

The Recordings panel provides information about the selected channel—queued, in-process, stopped, or completed—and enables you to copy the output path to your clipboard for use in other applications, such as a web browser or video player.

Note: Status details for Vantage Capture workflow can also be found in the Job Status Views web app. See *Using the Vantage Job Status Views Web App*.

You can not use multiple Capture actions in a workflow—when you attempt to add a second Capture action, Workflow Designer displays an error message, preventing from doing so.



The Recordings panel displays information in columns, described here:

Capture State—Indicates the real time state of the capture process (represented by the Capture action itself) for this channel's recording job:

Icon	Recording State
	The current recording is complete.
	In an idled state, either queued for or stopping recording.
	Recording is in progress.
	Recording has failed.

Vantage Job State—Indicates the real time state of the capture workflow's job in Vantage (which is set by the state of all actions in the workflow):

Icon	Job's Workflow State
	The workflow's job completed successfully.
	The job is waiting or in progress.
	The job has been stopped by the user.
	The job failed. Check the Job Status View for details of failed jobs. See *Using the Vantage Job Status Views Web App*.

Name—Displays the job name. The name varies for different trigger types and may include information such as base name, workflow name, or capture start time entries.

Duration—The duration that was specified to record, or the final duration. The Start **Name**—Displays the job name. The name varies for different trigger types and may include information such as base name, workflow name, or capture start time entries.

Duration—The duration that was specified to record, or the final duration. The Start and Stop timecode may also be displayed.

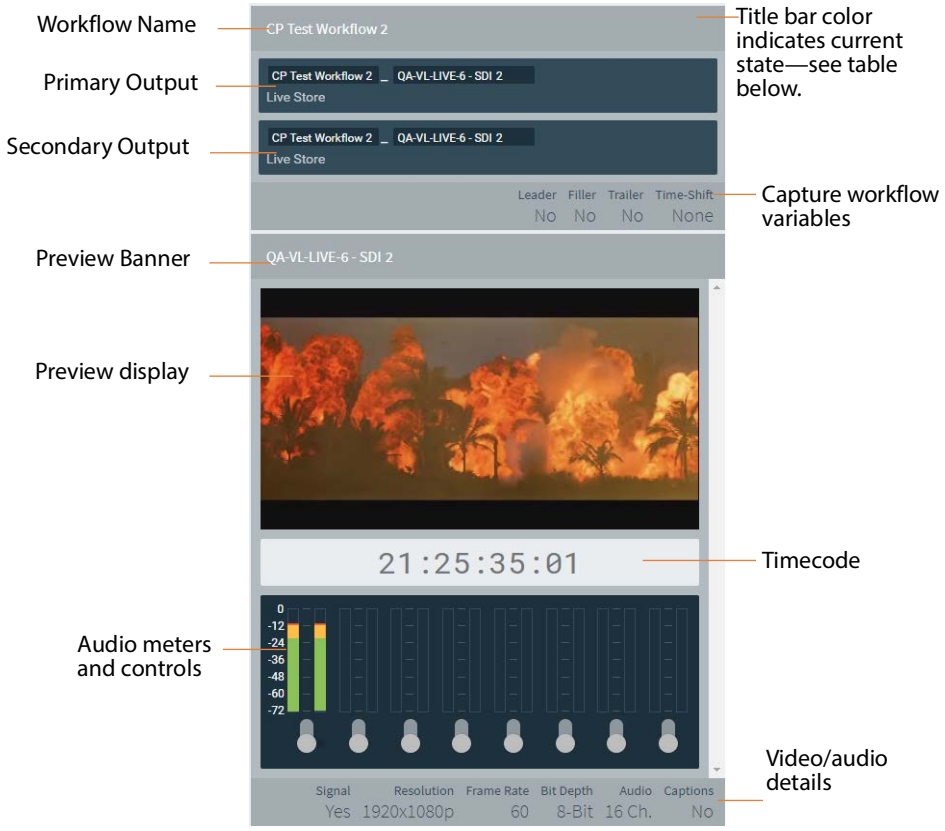
Primary Output—The primary output file name and location path. Click the icon to copy the output path to your clipboard. You can paste the copied path into Windows File Explorer, then log into the Live Capture server to open the file with an appropriate application.

Secondary Output—The secondary output file name and location path. Click the icon to copy the output path to your clipboard.

Customization—Custom settings that apply to the channel.

Channel Display and Information Panel

The Display and Information panel plays video and audio of the currently selected channel and provides channel status and other information, as shown in this example:



Workflow Name—Displays the channel workflow name.

Primary and Secondary Filename Pattern and Output Location—Displays the location where the output file is saved and shows the filename pattern set for the channel.

Preview Banner—The preview banner (directly above the Preview display) indicates the name of the workflow and the current state of the channel. When in the record state, it displays the elapsed time and a blue progress bar indicating the duration of the recording that has been captured.

Preview Banner	Current State
	Ready for recording to be initiated—displays the Vantage Domain and the source name.
	In a transition state, either queued up to record or stopping recording.
	Recording is currently underway.

Preview Display—Displays the content of the selected channel.

Source File Selections—Displays which of these variables have been enabled in the Capture workflow.

Audio Meters and Controls—Displays audio levels for all audio channels. The Preview Display can play just one channel pair at a time. Toggle a channel pair on to hear the audio for that pair. A level display bar shows variations in the audio level with green, yellow, and red indications and a decibel scale. Includes up to eight audio pairs.

Timecode—Displays the current timecode.

Video/Audio Details—Displays video resolution, frame rate, bit depth, number of audio channels, and whether captions are present.

Loss of Signal Behavior

If LOS is detected on an input at start-up and the state doesn't change, then:

The thumbnail and preview displays the LOS Video Test Pattern with LOS overlay indicating that the input channel is currently in an LOS state. The input is set to a default, un-configurable frame rate and resolution. Starting a Capture recording when the input is in this state results in a job failure with an LOS error.

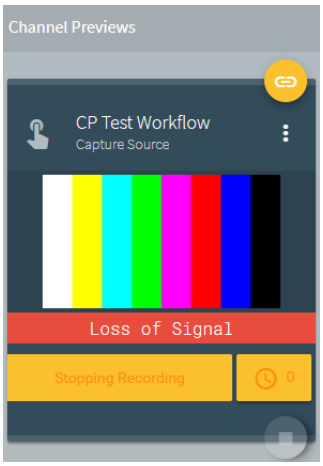
If LOS occurs after the input had good active video and channels associated with this input are not currently recording, then:

If Freeze on LOS is enabled the thumbnail and preview show the last frame of good video; otherwise, if Freeze on LOS is disabled the thumbnail and preview show the LOS Video Test Pattern. In either case the thumbnail and preview display an LOS overlay. The frame rate and resolution of the input is that of the previous active video. Starting a Capture recording when the input is in this state results in an immediate job failure with an LOS error.

If LOS occurs after the input had good active video and channels associated with this input are currently recording, then:

If Freeze on LOS is enabled, the thumbnail and preview show the last frame of good video; otherwise, if Freeze on LOS is disabled, the thumbnail and preview displays the

LOS Video Test Pattern. In either case the thumbnail and preview display an LOS overlay. The frame rate and resolution is that of the previous active video.



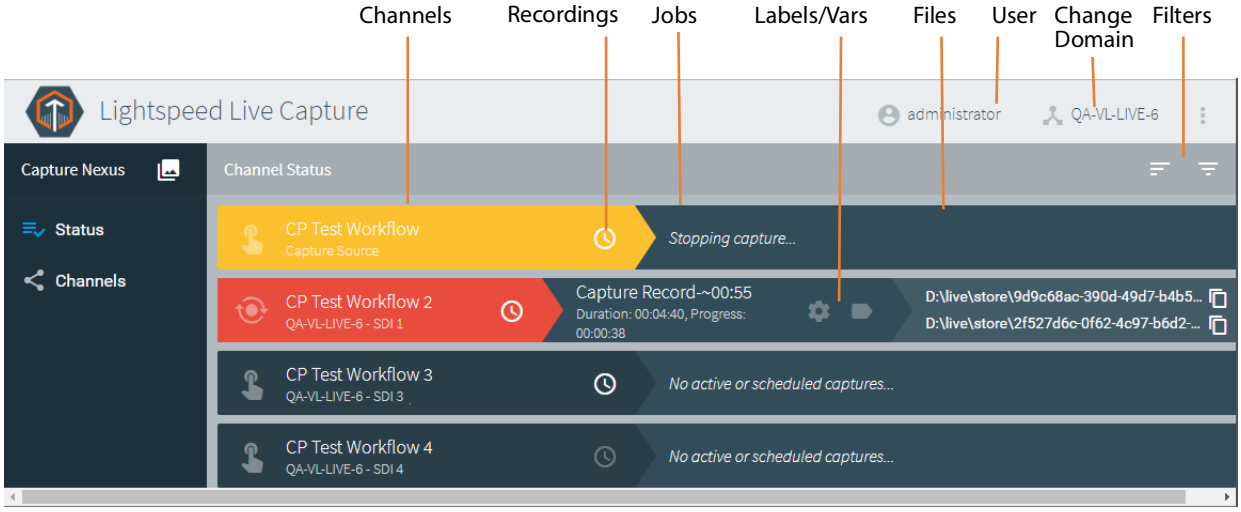
- Jobs that are recording with Ignore Lost Frames disabled in the workflow stop immediately. If the system is so configured, a new recording starts when the signal is regained. Enabling Ignore Lost Frames should not be necessary in most cases.
- Jobs that are recording with Ignore Lost Frames enabled continue capturing for their scheduled duration, and contain the frozen frame/color bar frame(s) or active video if it returns. When enabled, *all* input-related error messages are ignored without warning and capture continues.

Limited Bandwidth Behavior

If more than one second of preview data is buffered, a message displays, advising that the available resources are limited and audio is turned off in order to play video in the preview: "*Preview is degraded due to resource limitations. See User Guide for details*". Likely causes of the problem include network bandwidth or CPU/GPU over-saturation (not to exceed 75%; less than 60% is recommended). Taking actions to reduce the load on the network and processors may resolve the issue.

Channel Status Panel

When you select Status in the left panel, the Channel Status panel displays the current state of each channel in the current channel group, including current recording job status, and the previous job history. See the descriptions below for display details and *Viewing a Channel's Recordings History* for Recordings panel details.



Channels—The status display left column lists the channels in the channel group. Both the name of the channel and its description are shown. The trigger type appears beside the name.

Jobs—The status display middle column shows the current (pending or in-progress) job for each channel. The job's name, scheduled duration, and current progress counter are displayed.

Labels—The Labels icon displays the Labels panel, which shows labels and associated values generated by the channel workflow.

Variables—The Variables icon displays the Variables panel, which shows variables and associated values used by the channel workflow.

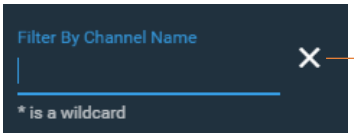
Captured Files—Primary and Secondary file outputs are listed. To quickly access captured files you can click the file name and path in the right-most column. The Captured Files panel displays. Click the icon to copy a file output path to your clipboard. You can paste the copied path into your Windows File Explorer, then log into the Live Capture server to open the file with an appropriate application.

Filtering Channel Status

Click the Status button in the menu to display the status of capture channels. You can order your channels by channel name, source, or trigger, and you can filter your channels by name.

Filtering Channels

Channels **Channels**—Select to filter the channel list by typing a portion of the channel name to see only the channels that contain the typed characters.



Filtering Jobs

Jobs **Jobs**—Select to filter by typing portions of the job name to see only the jobs in each channel that contain the typed characters.

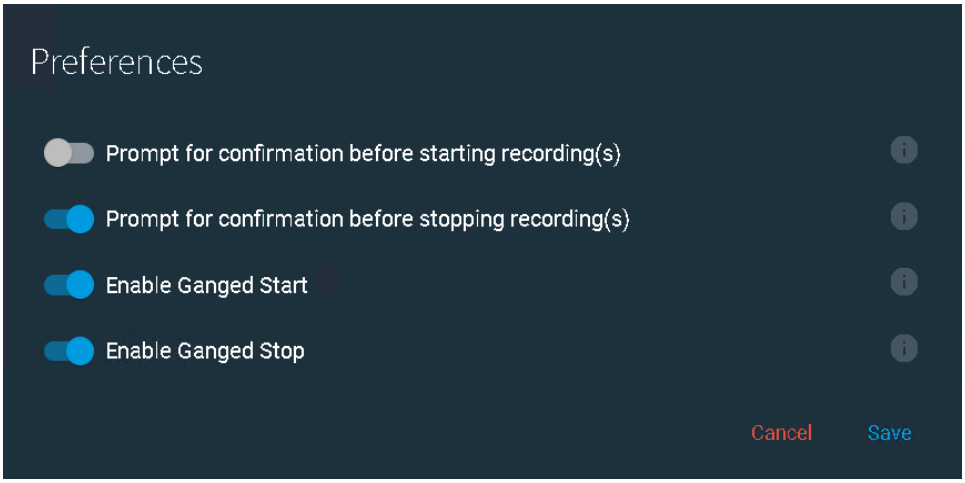
You can also select sorting options for additional refinements.

Setting Recording Confirmation Preferences

EDNOTE: Update these images to include Enable Immediate Ganged Stop.

Use the Preferences panel to enable and disable start and stop recording confirmation preferences. Recording confirmation only applies to manual recording; it is ignored when recording is started by any other means.

To display the Preferences dialog, select it from the Live Capture's More menu (to the far right in the title bar) > Preferences:



Starting Recording Confirmation

To display a confirmation dialog when you start recording, move the slider on the Prompt for Confirmation Before Starting Recordings control:

When you click the record button, Live Capture displays a confirmation dialog:

Live Capture won't start recording until you click Confirm. If you click Cancel, the recording is canceled and no Capture job is started.

Stopping Recording Confirmation

To display a confirmation dialog when you stop recording, move the slider on the Prompt for Confirmation Before Stopping Recordings control.

When you click the record button to stop, Live Capture displays a confirmation dialog:

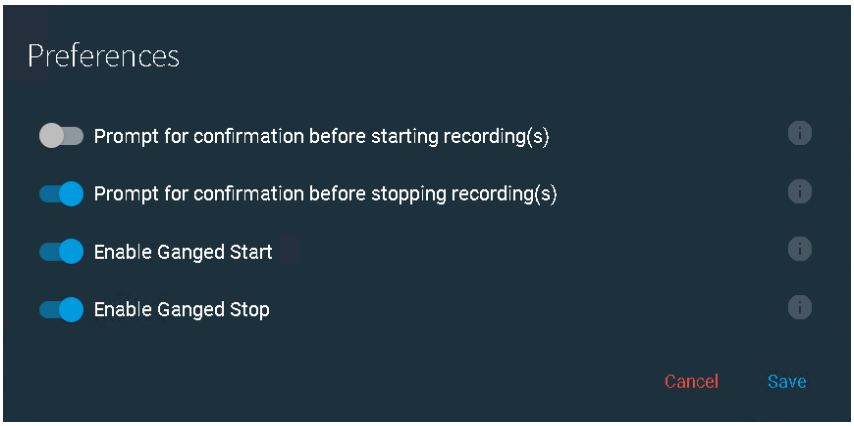
Live Capture won't stop recording until you click Confirm. If you click Cancel, the recording continues uninterrupted.

Enabling Immediate Ganged Start

To globally disable the Ganged Start button in Live Capture, move the preference slider for Enable Immediate Ganged Start to the left. The default is Enabled.

Note that when Immediate Ganged Start is disabled, you can still select the ganged icon in an individual channel, although the Ganged Record button is disabled.

This setting also disables the Record Ganged option in the Gang submenu.

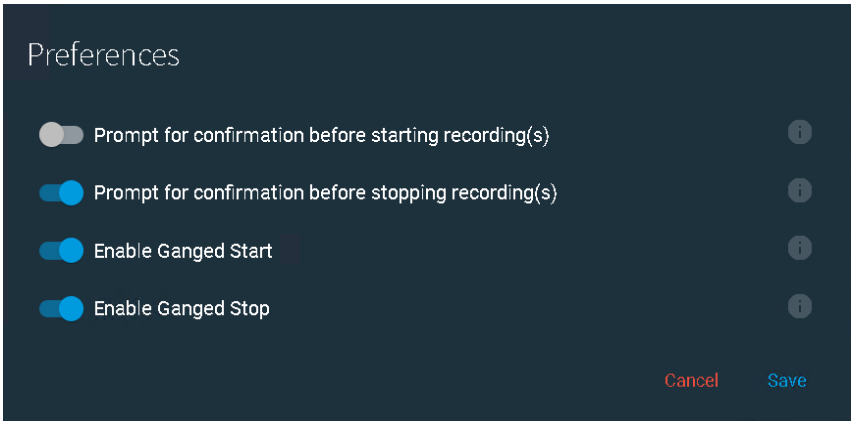


Enabling Immediate Ganged Stop

To globally disable the Ganged Stop button in Live Capture, move the preference slider for Enable Immediate Ganged Stop to the left. The default is Enabled.

Note that when Immediate Ganged Stop is disabled, you can still select the ganged icon in an individual channel, although the Ganged Stop button is disabled.

This setting also disables the Stop Ganged option in the Gang submenu.


Preferences
Prompt for confirmation before starting recording(s)
Prompt for confirmation before stopping recording(s)
Enable Ganged Start
Enable Ganged Stop
Cancel
Save

Using Triggers to Control Channel Recording

The trigger type that is specified in a Vantage Capture workflow's Capture action determines the method by which channel recording is controlled—manually, by an operator, or automatically via DAI or a web service, for example. For information about selecting triggers and their options in a Capture action, see *Configuring Trigger Settings*.

Topics

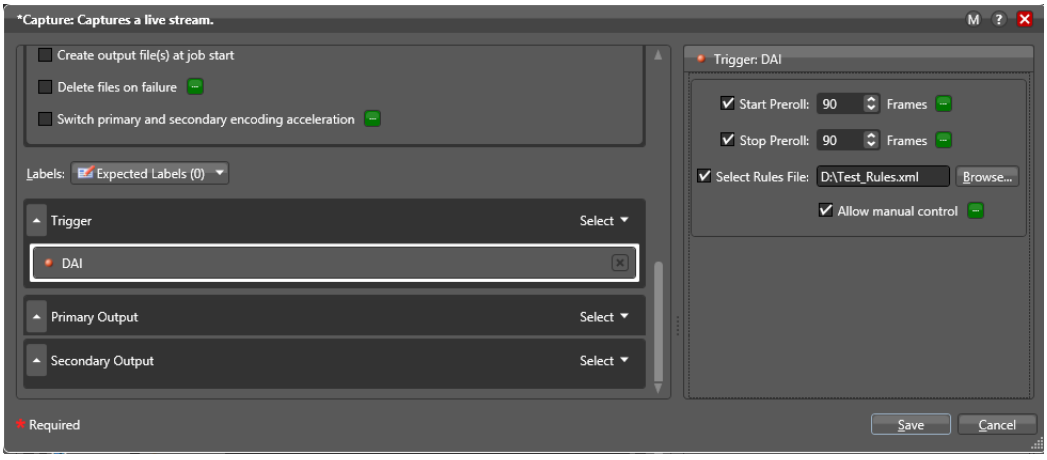
- Using DAI Triggers
- Using Manual Triggers
- Using Recurring Segment Triggers
- CalDAV Calendar Trigger
- Using Web Service Triggers

Using DAI Triggers

The DAI (Dynamic Ad Insertion) trigger enables automatic recording to start and stop based on incoming SCTE-104 markers contained in the VANC data stream of the workflow's SDI input. Recording begins when a Start Program marker is detected and stops when an associated Stop Program marker with an Event ID that matches the Start Program's ID is detected. Channels set to DAI trigger are presented in a read-only status unless Allow manual stop is checked in the Capture action to expose a manual stop button in the web app.

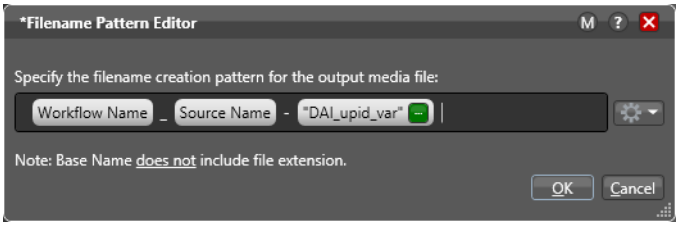
The following steps explain how to set up a DAI trigger. Steps shown here may vary according to your requirements:

1. In Workflow Designer, create a Live Capture workflow and configure the Capture action to use a DAI trigger.



2. Load the rules XML file (example shown below) into the DAI configuration (using Select Rules File) and make other DAI configuration selections. The file must include program start and end triggers and the UPID (identifier) of an ad to insert.

3. Use the Vantage Management Console > Variables panel to create a variable to extract the UPID value from the program triggers in the rules. (Using the UPID to populate a variable is optional.)
4. Use the variable in the Filename editor to capture the UPID value as part of the output base file name. (Using the UPID to populate the filename from a variable is optional.)



When the workflow operates correctly, the SCTE triggers in the source create a new job at the expected frame, the job stops at the expected frame, and the name of the inserted file matches the associated segmentation UPID.

The following example—the triggers element—illustrates a typical rules set:

```
<triggers>
  <rule>
    <description>Default Start - Program Start</description>
    <captureaction>Start</captureaction>
    <ignoreeventids/>
    <extracttovariable variablename="segmentation_upid_name">
      segmentation_upid</extracttovariable>
    <scte104>
      <multiple_operation_message>
        <time_signal_request_data>
          <pre-roll_time>0</pre-roll_time>
        </time_signal_request_data>
        <insert_segmentation_descriptor_request_data>
          <segmentation_type_id>16</segmentation_type_id>
        </insert_segmentation_descriptor_request_data>
      </multiple_operation_message>
    </scte104>
  </rule>
  <rule>
    <description>Default Stop - Program End</description>
    <captureaction>Stop</captureaction>
    <ignoreeventids/>
    <scte104>
      <multiple_operation_message>
        <time_signal_request_data>
          <pre-roll_time>0</pre-roll_time>
        </time_signal_request_data>
        <insert_segmentation_descriptor_request_data>
          <segmentation_type_id>17</segmentation_type_id>
        </insert_segmentation_descriptor_request_data>
      </multiple_operation_message>
    </scte104>
  </rule>
</triggers>
```

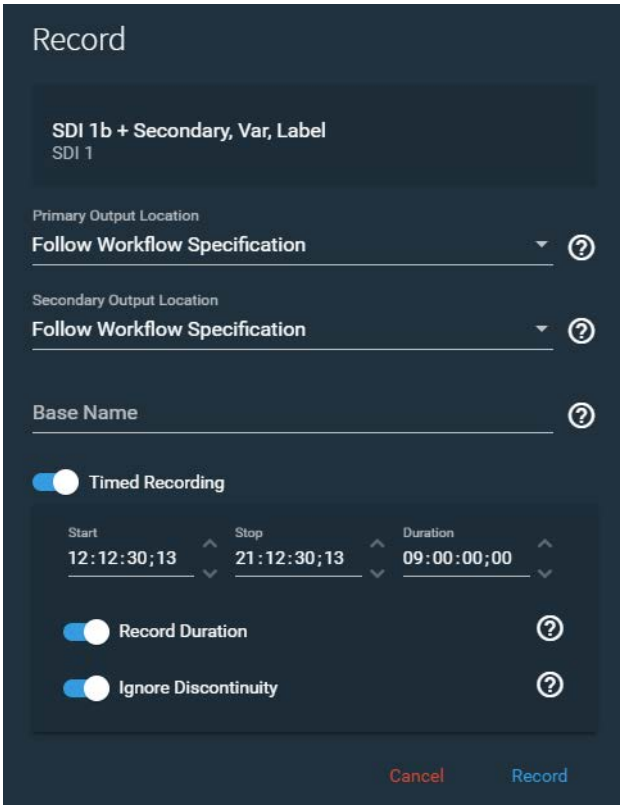
Note: SCTE-104 rules files may be complex. If you require assistance, contact Telestream Support (*Obtaining Support | Information | Assistance*) or your Telestream Sales Engineer for details on configuring them.

See *Configuring Trigger Settings* for specific DAI Trigger settings and details. You can also get help from Telestream Support in putting together workflows to enable DAI triggers.

Using Manual Triggers

The Manual start trigger enables you to control channel start and stop operation in the Live Capture web app. Click Record to display the Record panel so you can select settings for the record operation. You can also select the Record All option in the top bar of the Channel Previews panel to start the record operation for multiple channels.

See *Configuring Single-Channel and Custom-Ganged Recording* for descriptions of the Record panel controls.



Using Recurring Segment Triggers

The Recurring Segment trigger enables you to capture files of the duration specified in the Capture action's Recurring Segment control. Durations from 5 minutes to 8 hours are permitted. You can control when to start recording in the Live Capture web app by manually starting capture, via the API, or in Live Schedule Pro by adding an event,

unless the Capture action's Begin Recording on Workflow Activation control is also enabled—in which case, recording starts as soon as you activate the workflow.

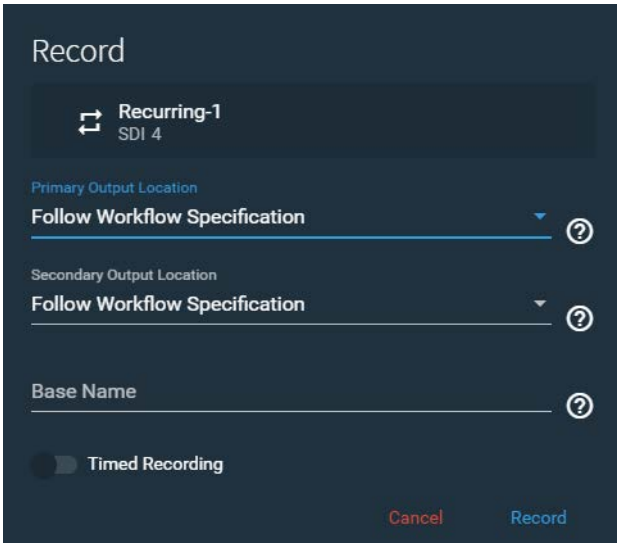
Note: For events in Live Schedule Pro, the recurring segment trigger workflow that you use should not have Start Recording on Activation enabled, and the optimal choice for the recurring segment scheme used in the workflow is Timecode.
Events for a recurring segment trigger workflow do not indicate a Queued state—it transitions directly from Waiting to Recording at the start of the event.
If any or all segments fail, Live Schedule Pro will not indicate the failure.
Event recording does not start or stop on the exact boundaries as set by the event; typically the offset is in the realm of seconds. Add an extra minute to the event duration to ensure the full range of the event is recorded.

WARNING: If video and timecode are not synchronized to the same reference, time code discontinuities can occur. To avoid time code anomalies such as unexpected discontinuities and repeated time codes, always sync the incoming SDI signal and timecode to the same genlock (reference) source. Failure to do so can cause recording that stop abruptly or do not stop as expected.

The first and last segments captured may be shorter than the specified duration, depending on when the recording start and stop commands are initiated.

In the Capture action, you can choose the method by which the duration is calculated, depending on your requirements.

The Timed Recording option doesn't apply to recurring segments. See *Configuring Single-Channel and Custom-Ganged Recording* for Record panel controls.



CalDAV Calendar Trigger

A CalDAV Calendar trigger enables you to record based on events in a CalDAV-compatible calendar. Channels that are set to CalDAV Calendar trigger are displayed in a read-only status view in the Live Capture web app. For configuration details, see *Configuring Trigger Settings*.

Note: The CalDAV Calendar trigger is specifically for use with CalDAV calendars. It should not be used with events created in Live Schedule Pro. For details, see topics in the Scheduling Live Capture Sessions chapter in the Live Schedule Pro User Guide.

Using Web Service Triggers

Use a Web Service trigger to perform live video capture using commands from the Live Capture REST API. You can queue up a maximum of 16 Web Service Trigger jobs per Live Capture host server at any one time.

Channels set to Web Service trigger with Allow Manual Control disabled are presented in a read-only status view in the Live Capture web app. If Allow Manual Control is enabled, manual controls and web service data is present on the channel's thumbnail card, allowing for full manual control (see *Channel Card Details | Status | Controls* for additional details). For more information see *Configuring Trigger Settings*.

Recorded File Formats and Locations

When recording is active, Live Capture output files are encoded and written to the Live store or the path specified in the Capture action under Output Location in the Primary Output or Secondary Output. To set the output locations, see *Configuring Primary and Secondary Outputs*. In addition, you can use a Push action in the workflow to deliver proxy media to AWS S3 storage in real-time.

To access the recorded files from the Live Capture web app, see *Viewing a Channel's Recordings History* and *Captured Files* under the *Channel Status Panel* heading in this chapter.

Selecting Output Encoders and Format

The primary output and secondary outputs in the Capture action enable you to select the container format and video and audio encoders to use for one or both captured outputs. You can create multiple output configurations in the Capture action, and then allow a Live Capture operator to choose which one to use for a given capture session. See *Configuring Primary and Secondary Outputs* for more information.

Delivering Secondary (Proxy) Output to AWS S3

You can add a Push action to a Live Capture workflow immediately following the Capture action, to deliver Live Capture HLS or DASH proxy (secondary) output to Amazon S3 object storage, all executing in Open mode.

The primary use case is for delivering Capture action secondary proxy output (HLS | DASH) files to remote object storage. All segments and manifest/playlist files are pushed to S3 as soon as they are written or updated during Capture job execution.

Deleting Captured Files

It is important to configure the Live store correctly to ensure that captured files are deleted when jobs are deleted or expired. Otherwise, obsolete recordings build up in the Live store, possibly filling up storage unnecessarily. For details about Live store configuration, see Live Capture Administration Guide > Identifying Live Stores with a UNC Path.

Using the Vantage Job Status Views Web App

Job Status Views is a Vantage web application that provides basic Vantage job monitoring and management via a web browser. You can use Job Status Views to access job information and manage jobs in your Vantage or Live Capture domain from anywhere on the LAN, or via the Internet if you provide access to your Vantage domain.

The Job Status Views web app is ideal for use when you don't have access to Workflow Designer, but want to monitor your jobs.

You can use the Job Status Views web application to...

- Display information about submitted jobs, including any errors that have occurred
- Sort and filter job entries
- Highlight and identify jobs in different states
- Troubleshoot job processing issues and view error messages.

The *views* that you see in Job Status Views are defined by Vantage administrators, who control which job information displays and which job control functions (such as the ability to delete a job) are allowed.

Views may be public or private and are configured in the Vantage Management Console. Public views are available to everyone, and private views are for use by specified Vantage users. See Configuring Vantage and Updating Live Capture in the Live Capture Administration Guide.

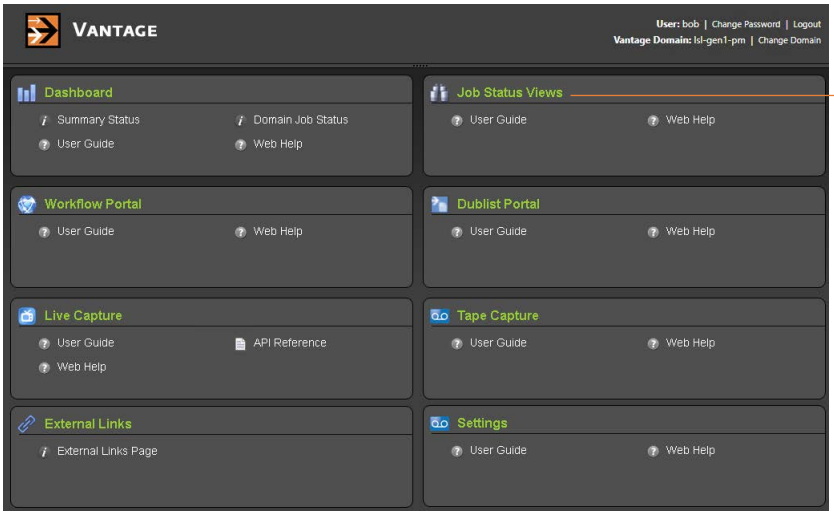
Topics

■ Launching the Job Status Views Web App
■ Using the Vantage Job Status Views Web Application
■ Configuring Job Status Views Information

Launching the Job Status Views Web App

To use the Job Status Views web App for Vantage or Live Capture or Tape Capture, click the Home button in the title panel to display the Vantage web portal.

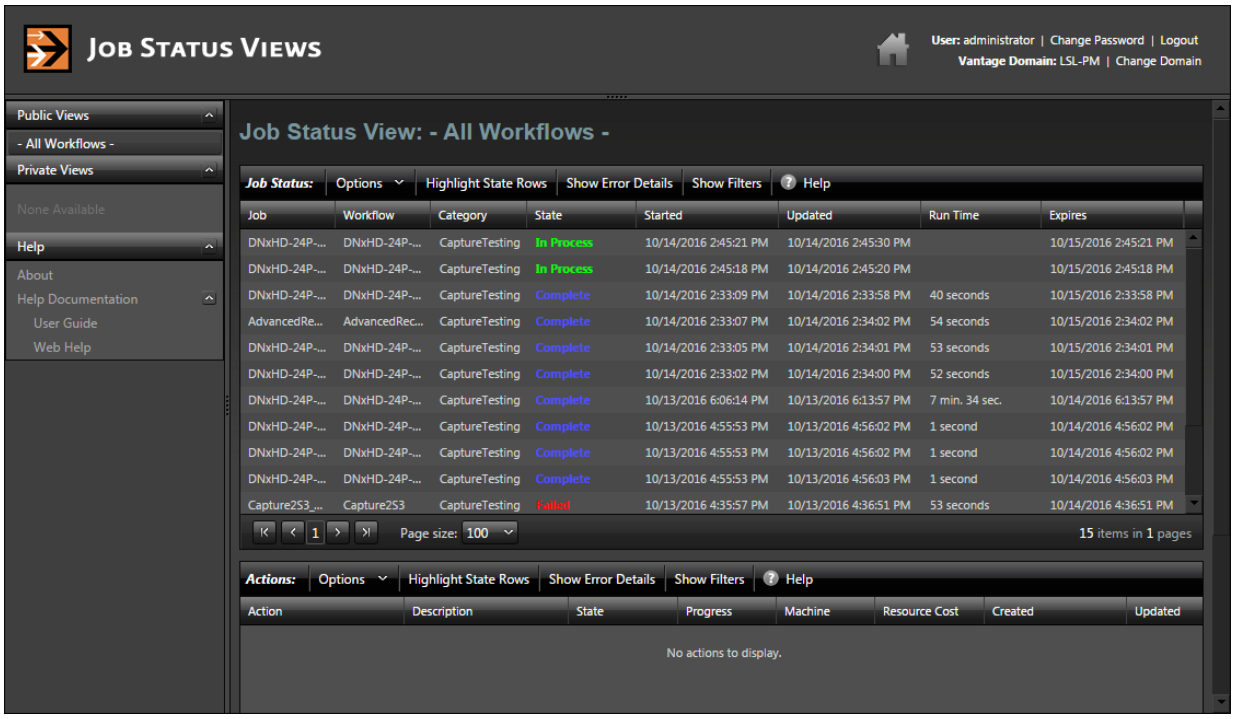
On the Vantage web portal, click the Job Status Views button.



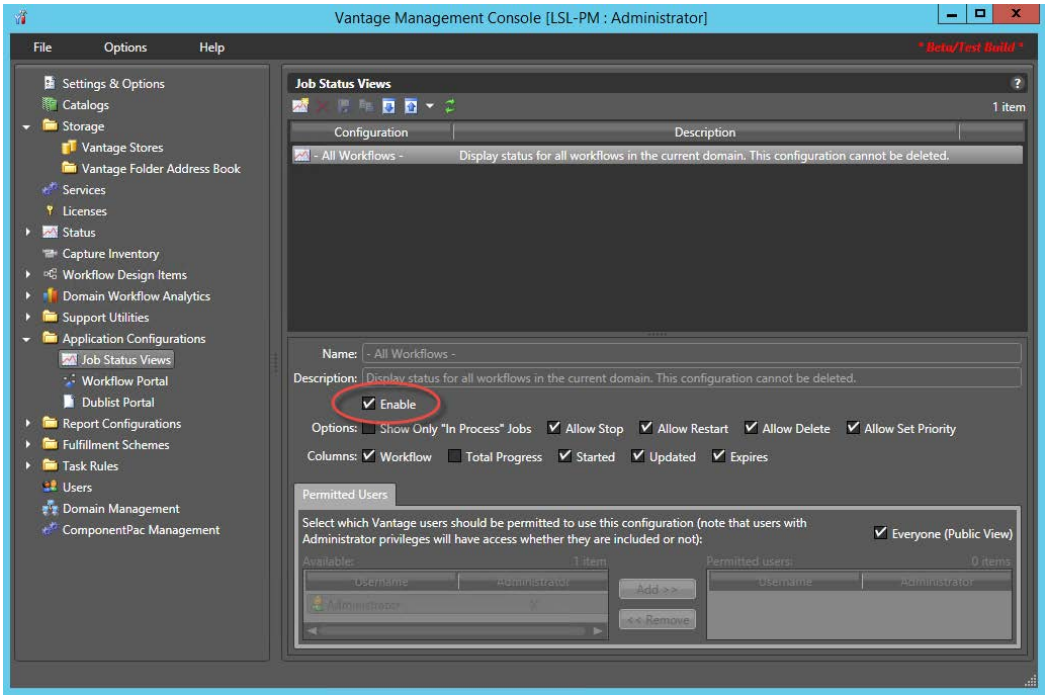
The Vantage Job Status View web app displays in your browser.

Using the Vantage Job Status Views Web Application

The following shows an example of information provided in the Job Status Views web application, this example is set to display All Workflows.



If no job status information displays in Job Status Views, you should make sure that this feature has been enabled in the Vantage Management Console. Open the Vantage Management Console and select *Application Configurations* > *Job Status Views*. Check the *Enable* option, shown in the red circle in the image below, then click the *Save* icon.

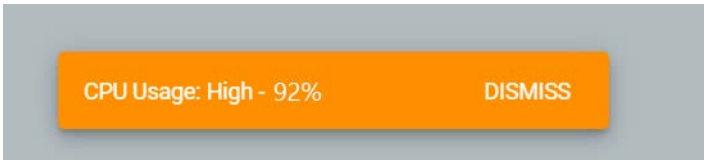


Configuring Job Status Views Information

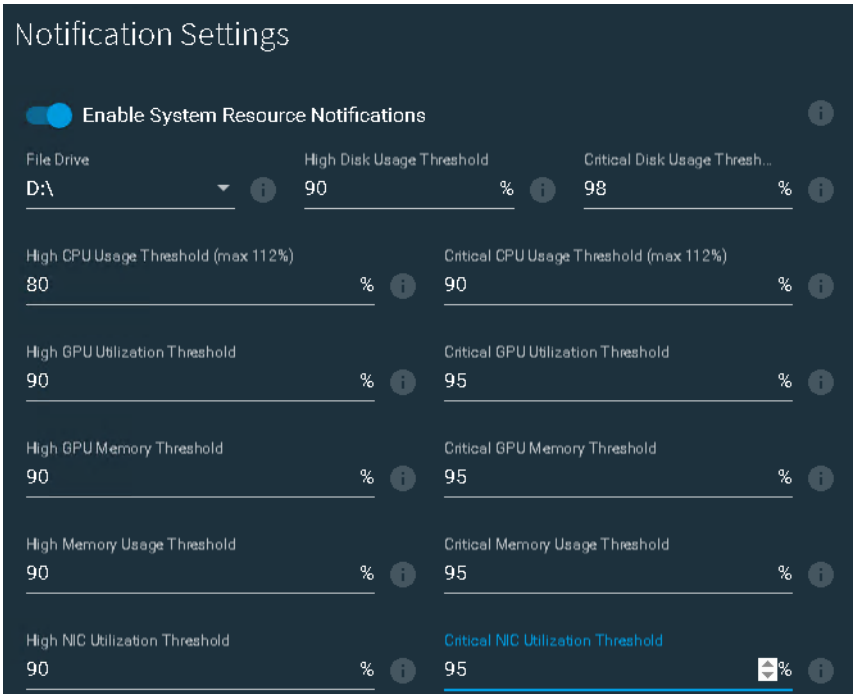
The information displayed in Job Status Views, and public or private access permissions, is configured in the Vantage Management Console. For details on customizing the Vantage Job Status Views see the Configuring Job Status Views topic in the *Domain Management Guide* on the Telestream web site.

Configuring System Health Settings

Use the Notification Settings panel to enable | disable your Live Capture system's resource notifications and configure thresholds for various aspects of system health in real time. When enabled and a threshold limit is exceeded, the operator is presented with a message identifying the problem. For example:



To display the Notification Settings panel, select it from the Live Capture's More menu (to the far right in the title bar) > Notifications:



Enable System Resource Notifications: Enable to display resource utilization warnings in real time, when thresholds you set are exceeded. Disable to ignore resource utilization thresholds.

File Drive: (Default: D:\) Specifies the drive being monitored for disk utilization.

High Disk Usage Threshold: (Default: 90%) Specifies the percent of disk space that may be consumed before displaying a High Disk Usage warning.

Critical Disk Usage Threshold: (Default: 98%) Specifies the percent of disk space that may be consumed before displaying a Critical Disk Usage warning.

High CPU Usage Threshold: (Max: 112%; Default: 80%) Specifies the percent of CPU usage tolerated before displaying a High CPU Usage warning.

Critical CPU Usage Threshold: (Max: 112%; Default: 90%) Specifies the percent of CPU usage tolerated before displaying a Critical CPU Usage warning.

High GPU Utilization Threshold: (Default: 90%) When GPU detected, specifies the percent of GPU usage tolerated before displaying a High GPU Utilization warning.

Critical GPU Utilization Threshold: (Default: 100%) When GPU detected, specifies the percent of GPU usage tolerated before displaying a Critical GPU Utilization warning.

Note: Setting this lower than 100% may cause warnings that have no impact on recording.

High GPU Memory Threshold: (Default: 90%) When GPU detected, specifies the percent of GPU memory consumption tolerated before displaying a High GPU Memory warning.

Critical GPU Memory Threshold: (Default: 95%) When GPU detected, specifies the percent of GPU memory consumption tolerated before displaying a Critical GPU Memory warning.

High Memory Usage Threshold: (Default: 90%) Specifies the percent of memory consumption tolerated before displaying a High Memory Usage warning.

Critical Memory Usage Threshold: (Default: 95%) Specifies the percent of memory consumption tolerated before displaying a Critical Memory Usage warning.

High NIC Utilization Threshold: (Default: 90%) Specifies the percent of NIC usage tolerated before displaying a High Adapter Usage warning.

Critical NIC Utilization Threshold: (Default: 95%) Specifies the percent of NIC usage tolerated before displaying a Critical Adapter Usage warning.

Capturing Tape Media

You use the Lightspeed Tape Capture web app to capture media stored on tape. Using Live Capture, you can set up and control VTRs, create clip logs, and capture the clips, encode the media and save it as a media files. You can also record whole tapes using Tape Capture. You can perform tape capture from most VTRs and video sources that support SDI I/O and RS422 control.

Note: Because Tape workflows require access to RS422-controlled tape devices, you can only use Live Capture systems hosted on a Lightspeed Live Server. Use on software-only platforms is not supported.

This chapter describes the Lightspeed Tape Capture web application, and how to use it.

Topics

- Tape Capture Overview
- Pre-requisites to Using Tape Capture
- Configuring a VTR Connection
- Tape Capture Controls and Status
- Checking on Job Status
- Using the Tape Capture Web App
- Resolving Tape Capture Error Messages

Note: For details on launching web apps and other general web app topics, see *Managing your Web Apps*.

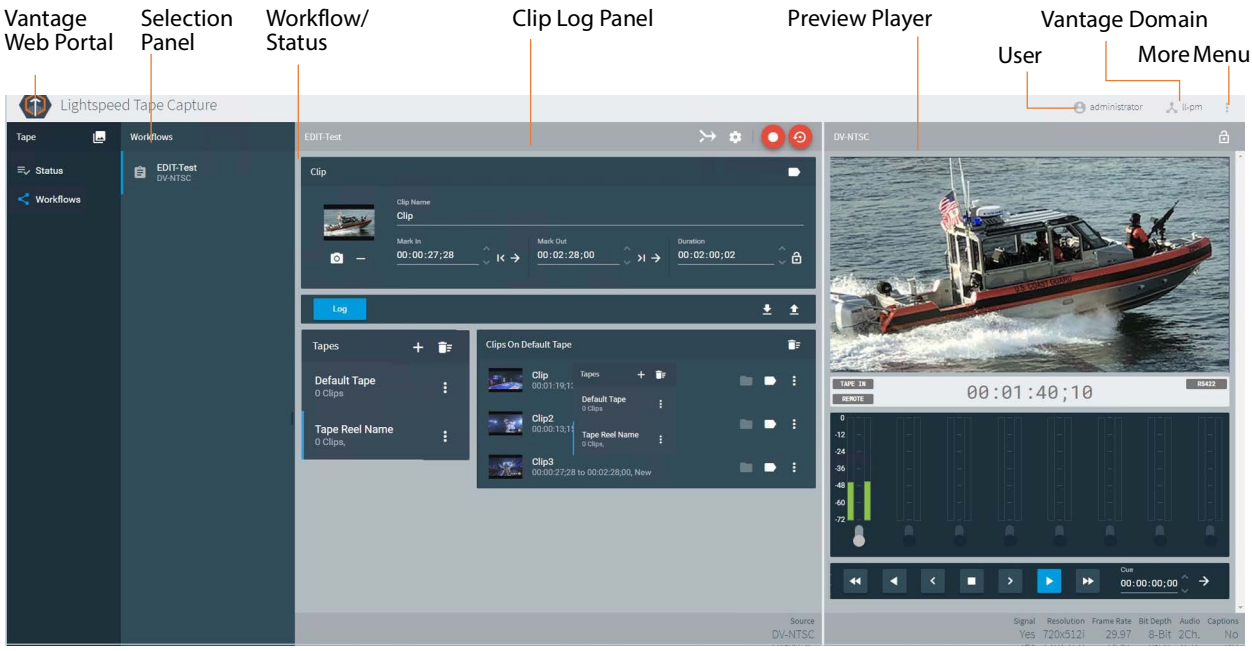
Telestream recommends reviewing *Pre-requisites to Using Tape Capture* to ensure your system is configured properly before using Tape Capture.

Tape Capture Overview

These are the key features of Lightspeed Tape Capture:

- Complete tape log and capture functionality in an HTML 5 browser client
- Logging multiple tapes and marking clips to be extracted from tape
- Captures clips from tapes into output media files with selectable container/codec
- Support for metadata labels and variables
- Full VTR transport controls with standard keyboard shortcuts
- Audio meters with 8 selectable stereo pairs
- Full user account controls for administrators and general users
- Source input locking to prevent users from competing for the same source.

The Tape Capture web application is organized in several panels:



Title Bar—At the top—Displays the Vantage Web Portal button, current Live Capture user (where you can log out), Vantage domain and user name, with controls to change domains, and access the More menu.

Selection Panel—Select Channel Group and Workflows or shows Status View.

Workflow/Status Panel—Shows workflows (if selected) or job status (if selected).

Clip Log Panel—Shows and controls tapes, clips, and media.

Preview Player Panel—Plays video, displays audio (8 stereo), provides VTR controls.

Pre-requisites to Using Tape Capture

Before you can use the Tape Capture web application to capture tape-based media, you must meet certain criteria:

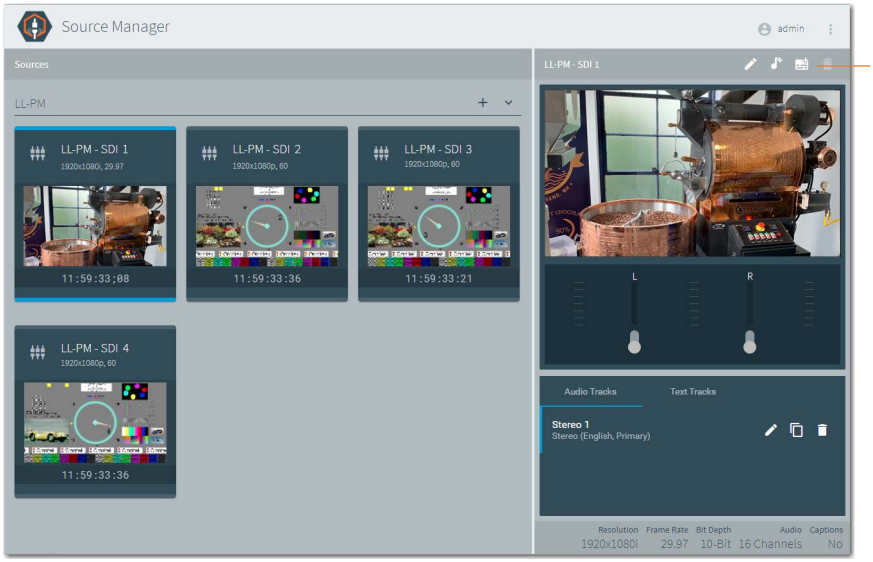
- Your Lightspeed Live Server must be connected to a VTR or other compatible tape source. See Live Capture Administration Guide > Connecting VTR Systems.
- Your VTR-based SDI sources must be set up. See *Configuring a VTR Connection*.
- You should enable user administration and create Vantage accounts for each user. See the Live Capture Administration Guide > Configuring Vantage and Updating Live Capture for instructions.
- You should create at least one tape capture workflow in Vantage (workflows with a Tape action) and activate it. See *Creating Tape Capture Workflows*.

Configuring a VTR Connection

To configure Tape Capture for VTR access, use the Source Manager web app (see *Managing Video Sources*) to set up your VTR-based SDI sources.

Follow these steps to configure the VTR connection (if you have additional VTRs, configure and save each SDI source connected to a VTR):

1. Make sure the VTR is properly installed and operating, and connected to one of the SDI ports on the Lightspeed Live Server. See Live Capture Administration Guide > Connecting VTR Systems for details.
2. Switch the VTR to the appropriate remote mode for operation via RS422 control.
3. Open the Source Manager web app (*Launching the Source Manager Web App*) and select the SDI source you want to use for the VTR connection (SDI 1 input—here named *LLPM SDI 1*—shown selected):



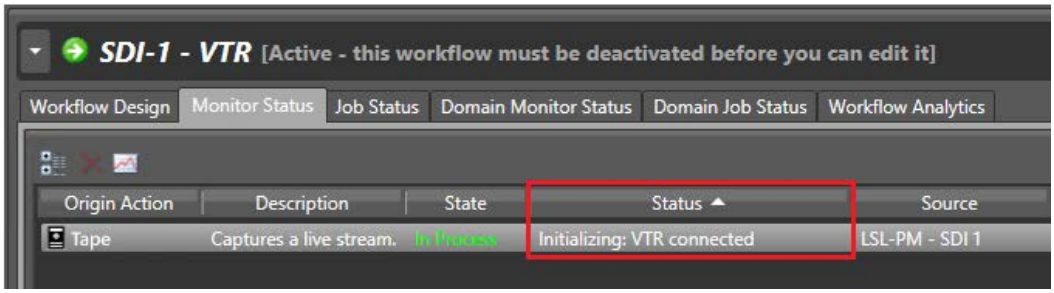
The source you select should match the terminal number to which the VTR is connected on the RS422 interface box. For example, when it is connected to channel 1 (CH1) on the RS422 interface box you should select SDI 1 input in Source Manager.

When you select a source, its preview panel displays on the right.

5. Click the Edit button in the details panel toolbar to display the Configure Source dialog, and select *RS422* from the Timecode Source menu.
6. Make changes to other settings as appropriate for your application.
7. Click Save to update the source configuration.

Checking VTR Connection Status

Activate your tape capture workflow in Workflow Designer, and display the Monitor Status panel—the workflow's origin action (Tape) should display this status: *Initializing: VTR connected*:



When the VTR connection is successful, use the Tape Capture web app to set recording parameters and control the VTR to play out the media from tape. When you play out the tape, the specified Tape workflow will start a job, capture the SDI stream and serialize it into the specified file.

Troubleshooting the VTR Connection

A problem that you may encounter is that the time code source is not set to RS422 in the source settings (see *Step 5*, preceding). If the time code source isn't set to RS422 the tape capture web app displays the *Initializing: VTR not connected* error in the Status field.

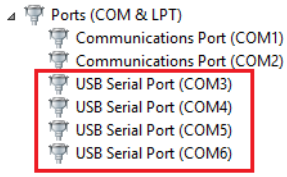
If you have an active tape capture workflow running in Vantage, but its Monitor Status displays *Initializing: VTR not connected*, solve the problem using these steps:

Note: After performing each step above, in Workflow Designer, check the workflow's Monitor Status panel again, to see if the Status has changed to *Initializing: VTR connected*.

---

1. Make sure that the RS422 interface box is correctly installed, all adapters and cables are properly connected to the Lightspeed Live Server, and the VTR is powered up. See Live Capture Administration Guide > Connecting VTR Systems for instructions.
2. Check that the source of the Capture action matches the RS422 port to which the VTR is connected. For example, when using SDI 1 input for the Lightspeed Live Server in the Capture action you must connect to Channel 1 (CH1) on the RS422 interface box. See Live Capture Administration Guide > Connecting a VTR to the Lightspeed Live Server for details.
3. Check that the RS422 interface box's serial ports are shown in the server's Device Manager. Open the Windows Device Manager and toggle open the Ports (COM &

LPT) devices. When properly connected, the ports of the RS422 interface box displays as *USB Serial Port (COM3)* through *USB Serial Port (COM6)* as shown here:



4. Check the properties for each USB port to verify that its settings are correct:

   Bits per Second—9600

   Data Bits—8

   Parity—None

   Stop Bits—1

   Flow Control—None

5. In Advanced... confirm that Latency Timer (msec) is set to 1. For details on adjusting this setting, see Live Capture Administration Guide > Configuring RS-422 Port Latency Time.
6. Verify that the SDI input associated with the VTR is connected to a live SDI video source.
7. If the VTR is not connecting after performing these steps, try replacing cables.

When the VTR connection is successfully initialized, use the Tape Capture web app to set recording parameters and control the VTR to capture the media from a tape.

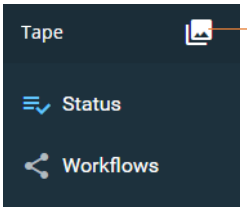
Tape Capture Controls and Status

The Tape Capture web application provides controls, options, and status information to perform clip log and whole tape capture operations.

Selection Panel

Context Help File: CAPUG_Tape_Selection_Panel.html

The Selection panel at the far left enables you to view Channel Groups, Status View, and Workflows panels.



Channel Groups—Click the Channel Groups button to select a channel group. This is the first selection you must make. See *Step 10* in the Up and Running Checklist > In the Management Console topic.

Status—Click Status to open the job status view panel.

Workflows—Click the Workflows button to display the active Vantage workflows in the selected channel group.

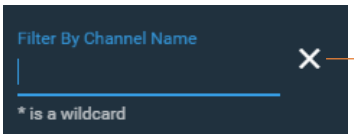
Checking on Job Status

Click the Status button in the menu to display the status of tape capture channels. You can order your jobs by channel name or source, and you can filter your channels by name.

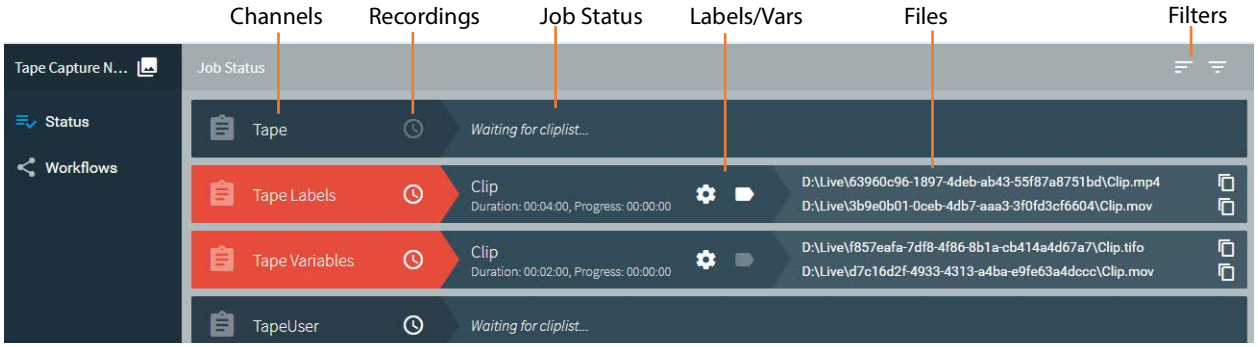
Filtering Job Status (Far Right)

Context Help File: CAPUG_Tape_Channels_Dlog.html

Channels **Channels**—Select to filter the channel list by typing a portion of the channel name to see only the channels that contain the typed characters.



Jobs **Jobs**—Select to filter by typing portions of the job name to see only the jobs in each channel that contain the typed characters. You can also select sorting options for additional refinements.



Channels—The status display left column lists the channels (workflow) in the channel group.

Recordings—Click to display the channel recording list.

Job Status—Displays the current (pending or in-progress) job for each channel. The job's name, scheduled duration, and current progress counter are displayed.

Labels—The Labels icon displays the Labels panel, which shows labels and associated values generated by the channel workflow.

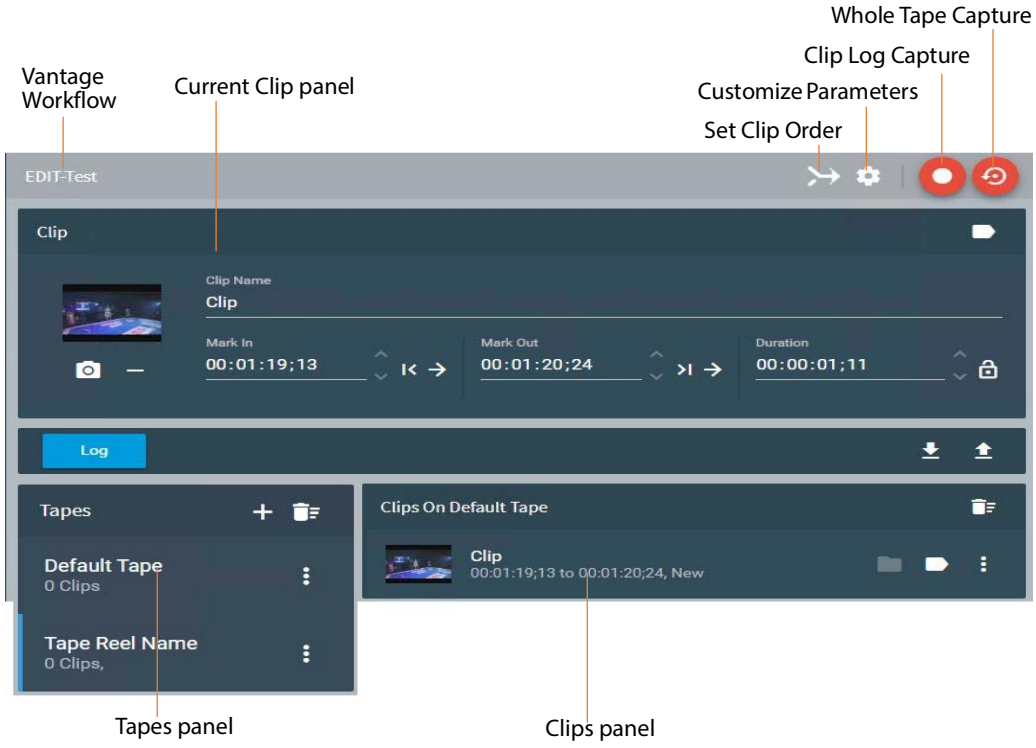
Variables—The Variables icon displays the Variables panel, which shows variables and associated values used by the channel workflow.

Captured Files—Primary and Secondary file outputs are listed. To quickly access captured files you can click the file name and path in the right-most column. The Captured Files panel displays. Click the icon to copy a file output path to your clipboard. You can paste the copied path into your Windows File Explorer, then log into the Live Capture server to open the file with an appropriate application.

For details see the Vantage Job Status Views web app and *Using the Vantage Job Status Views Web App*.

Using Vantage Tape Workflows

Click the Workflows button to display the active Vantage workflows in the selected channel group. Select a workflow to display its details:



This panel enables you to view sources, mark clips, and capture the media using this workflow, and view details about its configuration.

To create and use clip logs, the Log Panel displays the clip log for the selected tape source and enables you to add new tapes and select them. You use this panel to capture tape-based media in two ways: Capture the whole tape, or create and add clips to a log that you want to extract from the tape, and use the clip log to capture clips to media files.

Vantage Workflow—The Vantage workflow that is assigned to execute this capture displays in the tile bar. To select another workflow for this capture operation, use the Workflow panel (see *Checking on Job Status*).

For details about capturing the whole tape and capturing clips, see *Capturing Media*.

To use the Log Panel, use the default tape or add a tape and select it in the Tapes list, use the Preview Player and the current clip in the Clip Log to mark in and mark out the clip start and end points, and click Log to enter the clip into the log. Repeat as required, and when ready to capture the clips, click Capture. See below for control details.

Note: To edit a timecode, click on any time unit and change its value, and tab between units. Press Enter to return focus to the entire timecode and retain changes. Press Escape to exit timecode edits without saving changes.

Clip Panel

Clip Name—Place the cursor in this field and enter a clip name.

 **Use Current Preview Frame**—Click to use the preview frame as the thumbnail.

 **Remove Thumbnail**—Click to remove the thumbnail image from the display.

 **Mark In**—Click to update the Mark In point to the tape's current timecode position, or manually enter the timecode. Click the right arrow button  to cue the machine to the previously set mark in point.

 **Mark Out**—Click to update the Mark Out point to the tape's current timecode position, or manually enter the timecode. Click the right arrow button  to cue the machine to the previously set mark out point.

Duration—The duration is calculated as the out time minus the in time. Enter a new duration in the timecode fields to change the duration. The out timecode changes to match and the in timecode remains the same.

When entering timecode in the In | Out | Duration fields, click on a pair of numbers and use the tab key to advance to the next pair of numbers in the timecode.

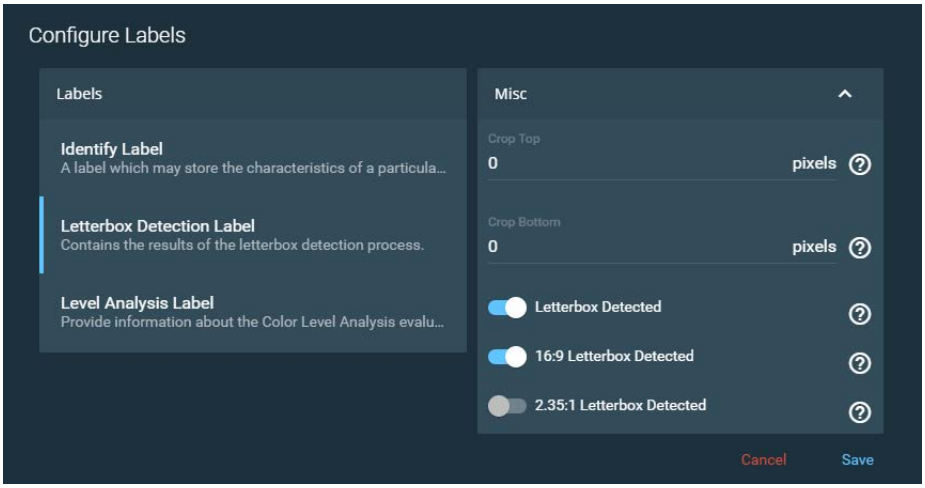
 **Duration Lock**—The lock feature allows manual editing when locked, but prevents the duration from changing automatically. When locked (lock top closed), duration always remains the same even though in and out times change. When unlocked (lock top open), duration can change automatically with changes to in or out times. Manual duration entries are always allowed whether locked or unlocked.

Click to disengage the lock and allow duration changes. Entering a new in timecode changes the duration timecode but leaves the out timecode unchanged. Conversely, entering a new out timecode changes the duration timecode but leaves the in timecode unchanged.

Click again to engage the lock to protect the duration. Duration always stays the same unless entered manually. If you change the in timecode, the out timecode adjusts to

match the new in time and the locked duration. If you change the out timecode, the in timecode adjusts to match the new out timecode and the locked duration.

Metadata—Click the metadata button to open the Configure Labels dialog to access and modify metadata contained in any Label added to the Tape action.



The contents of the metadata depends on the metadata labels you created in the Vantage Management Console and added to the Tape action. You can use labels in downstream Vantage actions or you can transform them into text or XML for out-of-band delivery. To make labels see Configuring Vantage and Updating Live Capture, Step 7. To add labels to the Tape action use the Expected Labels option, see *Creating Tape Capture Workflows*.

Clip Logging

Log **Log**—The Log button commits the current clip to the Clip Log using the associated mark in and mark out points, duration, label metadata, clip name, and thumbnail. Clips are associated with the currently selected tape name.

EDL File Import and Export

Import—The import button imports a CSV-formatted clip list that was previously created and exported to a file. The imported file populates the Clip Log.

You can import clips from a CSV file using the following format:

[Tape Name], [Clip Name], [Mark In], [Mark Out]

Example EDL (Edit Decision List) in CSV format:

```
Tape 1,Clip 1,00:11:45:00,00:12:13:00
Tape 2,Clip 2,00:14:15:00,00:16:20:00
```

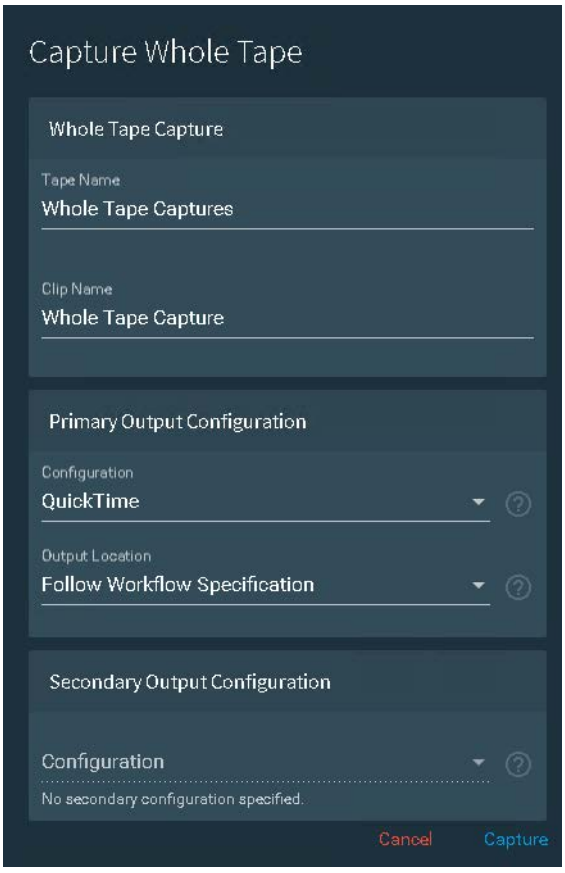
Export—Use the export button to export the current Clip Log to a CSV clip list file that you can re-import again later. Exported lists are named [workflowname].csv (using the associated Vantage workflow name) and are exported to the default download

folder specified by the Chrome browser. You can see and set the default folder in Chrome > Settings > Advanced Settings > Downloads.

Capturing a Whole Tape

Capture a Whole Tape—To capture all of the media on a tape, click the Whole Tape Capture button. Tape Capture automatically creates a single clip with mark in and mark out timecode values that instruct Tape Capture to record the entire tape from the beginning to end and save it as a file, as configured in the Tape action of the target workflow.

Tape Capture displays the Capture Whole Tape dialog:



Configure these controls and click Capture:

Whole Tape Capture

Tape Name—(Default: Whole Tape Capture) When capturing to a QuickTime | QuickTime Open container as configured in the target workflow's Tape action, specifies the tape name, which populates the Title metadata field in the file.

Clip Name—(Default: Whole Tape Capture) Specifies the clip name; optional for whole tape capture.

Primary Output Configuration

Configuration—Specifies the container type; the list is generated from the target workflow's Target action's primary configurations, which may be one or more.

Output Configuration—Specifies the location, which must be specified directly in the Tape action.

Secondary Output Configuration

Secondary Output Configuration—Specifies the container type; the list is generated from the target workflow's target action's secondary configurations, which may be zero or more.

Output Configuration—Specifies the location, which must be specified directly in the Tape action.

When you click Capture, the tape rewinds to the beginning and captures the content on the tape until EOT (End of Tape) is reached.

Note: Abort on Discontinuity is ignored when you are capturing a tape using the Whole Tape Capture button.

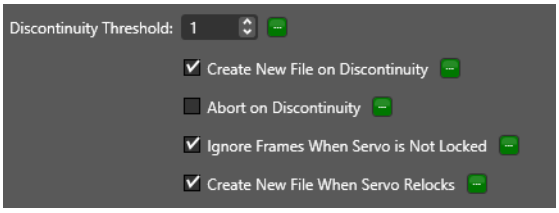
Source Display—The bottom of the panel displays the VTR source for the current clips.

Timecode Break Recording

To set up a timecode break capture—a process that automatically creates a new clip file when a break in the timecode is detected—make sure that the Tape action is configured in your workflow as described below.

The Timecode Break feature creates separate files when it detects a break in the timecode. To accommodate dropped frames when the tape was recorded, set the Frame Threshold control.

In the Tape action in your Vantage workflow, set these configuration options to control timecode break recording:



You can set these options statically for every job. Or, you can bind them to variables for modification on a job-by-job basis. If you plan to modify these options directly in the Tape Capture web app, bind them to variables in the Tape action in your workflow, so that they are configurable in the Tape Capture web app; see *Binding Variables to Configuration Controls*. Activate the workflow to display your variables here and enable,

disable, or change them using the gear icon in the Tape Capture Customize Parameters menu.

After you've set up and configured your workflow, activated it, and logged your clips, click Capture to initiate timecode break recording.

Note: The following configuration options affect how files are created in a Timecode Break workflow. It is important to understand how each option affects the files that are created. Some experimentation may be necessary to create the results desired.

Discontinuity Threshold—Specifies the minimum number of skipped frames that constitutes a discontinuity (timecode break) state. This threshold affects both Create New File on Discontinuity and Abort on Discontinuity, when enabled. Note that decremented and repeated frames always count as timecode discrepancies, and for these discrepancies, the threshold setting is ignored.

Create New File on Discontinuity—When checked and timecode discontinuity is detected, specifies that the current media file is closed and a new media recording file is opened. During an active capture recording, if a discontinuity is encountered, the current capture file completes and a new media file recording immediately starts.

Note: This feature is not functional in tape capture workflows where Primary Output or Secondary Output is configured to generate AVC | HEVC | MPEG2 video.

Timecode discontinuities are defined as follows:

- Timecode increments by a value equal to or greater than the selected Discontinuity Threshold value.
- Timecode repeats. The Discontinuity Threshold value is ignored in this case.
- Timecode decrements. The Discontinuity Threshold value is ignored in this case.

Example 1: A timecode incrementing from 00:00:30;10 to 00:00:30;15 is detected by a threshold of 4 or less.

Example 2: A timecode repeating from 00:00:30;10 to 00:00:30;10 is detected.

Example 3: A timecode decrementing from 00:00:30;10 to 00:00:29;00 is detected.

Abort on Discontinuity—Ends the current recording when timecode discontinuity is detected. Mutually exclusive with *Create New File on Discontinuity*.

Note: Abort on Discontinuity is ignored when you are capturing a tape using the Whole Tape Capture button. See *Capturing a Whole Tape*.

Ignore Frames When Servo is Not Locked—If enabled, all frames captured while the servo is in the unlocked state (as reported by the VTR) are excluded from the output file.

Create New File When Servo Relocks—If enabled, creates a new media file when the servo re-locks after being in the unlocked state. When a servo relock is encountered

during an active capture recording, the current capture file completes and a new media file recording starts.

Note: This feature is not functional in tape capture workflows where Primary Output or Secondary Output is configured to generate AVC | HEVC | MPEG2 video.

- If *Create New File When Servo Re-locks* is enabled and *Ignore Frames When Servo is Not Locked* is disabled, the system may create unwanted (unlocked) frames at the end of output files.
- If *Create New File on Discontinuity* is enabled and *Ignore Frames When Servo is Not Locked* is also enabled, the result may be an output file that contains a discontinuous timecode, even though *Create New File on Discontinuity* is enabled and the timecode was always incrementing. This occurs because of the system ignoring frames, regardless of the timecode, while the servo is unlocked.

  With this configuration, the frames captured during the period when the servo was unlocked are excluded from the output. New frames are added to the file when the servo re-locks, which causes the output file to have discontinuous timecode. To avoid this scenario, enable the *Create New File When Servo Relocks* option. In this state the re-lock of the servo starts a new file where the discontinuity in the output file would have been.
- As described above, repeating timecodes are counted as discontinuities. Most VTRs repeat timecodes when the servo is unlocked; therefore, if *Ignore Frames When Servo is Not Locked* is disabled and *Create New File on Discontinuity* is enabled, the result may be many single frame files while the servo is unlocked. This won't happen if *Ignore Frames When Servo is Not Locked* is enabled.
- With many VTRs, particularly an SRW-5800, there may be gray frames after the servo re-locks. Timecode for these frames is often invalid. Because the system is only able to respond to the status the VTR provides, it won't detect and exclude gray frames.
- No two passes of the same section of tape are likely to be identical. This occurs because the VTR can sometimes take longer than others to lock the servo after the control track is detected. Therefore, it is important to check the logs to verify whether the servo was locked while a specific frame was captured.
- For previous users of Telestream's Pipeline tape capture product, enabling all three settings above provide the cleanest results and the closest to what Pipeline did.

Tapes Panel

The Tapes panel enables you to create tape names and add them to the list. You can then associate clips with the names of the tapes where they originated. Do this by selecting a tape before selecting Log to log a clip or drag a clip from the Clip Log onto a tape to make the association.

+ (Plus)—Opens the Configure Tape dialog. Enter the name of the tape and click Save to save (or Cancel to cancel) the new tape to the Tapes list.

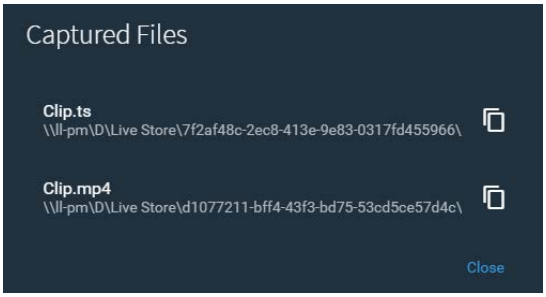
Trash—Click trash to delete all tapes from the tape list.

Modify—The modify (three dots) button opens a dialog to edit or delete the tape. Click Edit to view and modify tape details. Click Delete to delete the tape. Deleting a tape deletes the associated logged clips. Deleting all tapes deletes all logged clips.

Clip Log Panel

The Clip Log displays a list of clips that have been marked for recording in the media output file. After you set up a clip in the Clip log panel, clicking the Log button adds the clip to the Clip Log. The name displayed for the Clip Log changes depending on which tape is selected. The format of the name is: Clips On + <Name of Selected Tape>.

Captured Files Folder—To quickly access captured files, click the folder icon to display the Captured Files panel. Click the icon to copy the file output path and paste it into Windows File Explorer. Then, log into the Lightspeed Live Server to open the file with an appropriate program.



Metadata—Click the Metadata button to access and modify the Labels metadata list. The contents of the metadata depends on the metadata label(s) you created in the Vantage Management Console. See Metadata above in Clip Panel for more information.

Modify—Click the Modify (three dots) button to display a panel for selecting *Edit Entry* to view and modify clip details, or *Remove Entry* to remove the clip.

Trash—Click the Trash icon to delete all clips from the clip log.

Capturing Media

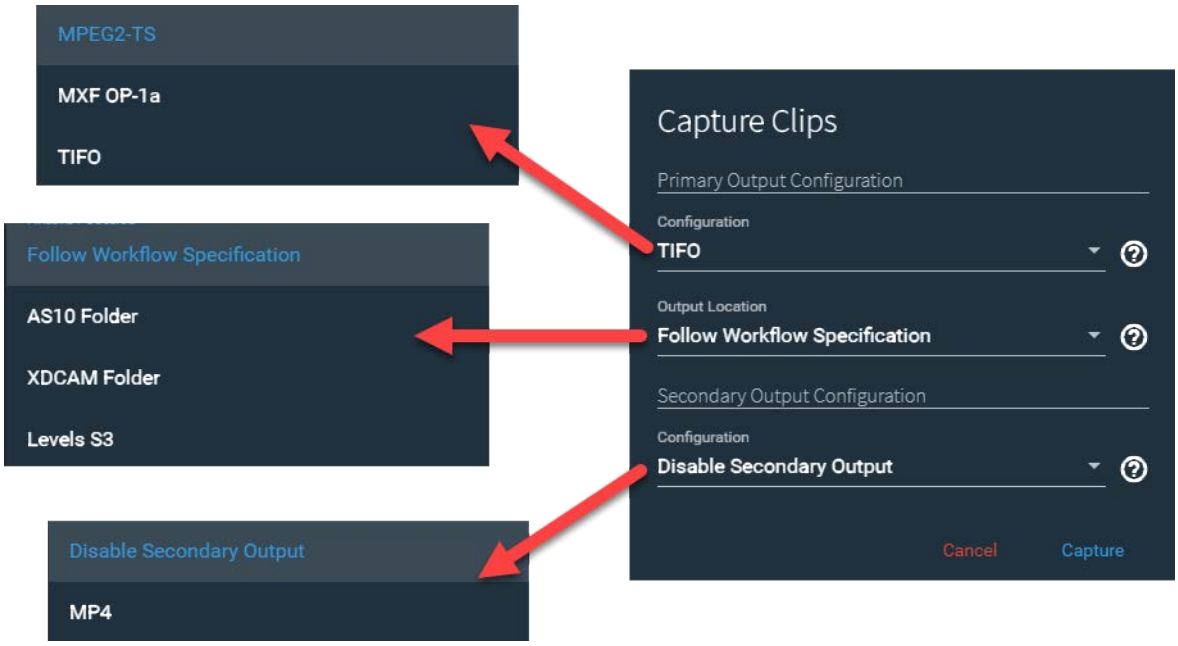
Use these buttons (at the top right corner of the Log panel) to alter your clip stitching order and update workflow variables.

Set Clip Order—Click to display the Clip Stitch Order panel:

This panel displays the list of clips in the clip log. To re-arrange their order, select a clip and use the up and down arrows to re-arrange the list. Or, drag-and-drop them on their new location in the list.

Customize Parameters—Click the gear icon to display the Customize Parameters panel and configure Tape action parameters that are bound to a variable so that you edit them here in Tape Capture, on a job-by-job basis. You can display any description contained in a variable—select the question mark tool tip (?) next to each parameter. The question mark (?) also provides a tool-tip to explain the parameter. Also see *Configuring Tape Parameters that are Bound to Variables*.

Capture—Click the Clip Log Capture button to read clips in the clip log, encode them and write the media to a media file. When you click Capture, the Capture Clips dialog displays.



From Capture Clips you can make these selections for the capture operation:

Primary Output Configuration—Select a container configuration that was added in the Tape action for the Primary Output. The configuration names are in alphabetical order and the full name is displayed.

Output Location—Select a Vantage Folder Address Book entry or select *Follow Workflow Specification* to use the location set in the Tape action workflow.

Secondary Output Configuration—Select a container configuration that was added or enabled in the Tape action for the Secondary Output. The configuration names are in alphabetical order and the full name is displayed.

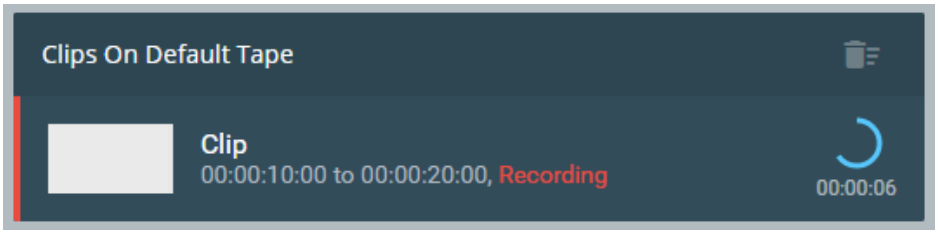
To add Primary and Secondary outputs, see *Configuring Primary and Secondary Outputs*.

Activate Capturing

When you click Capture in the Capturing Clips dialog, the dialog closes and Capturing starts and the blue Capture button in the top bar changes to Capturing during the recording operation.

Monitoring Capturing

When a capture is in progress, the Clip Log indicates which clip is currently recording and which clips are submitted to be recorded.

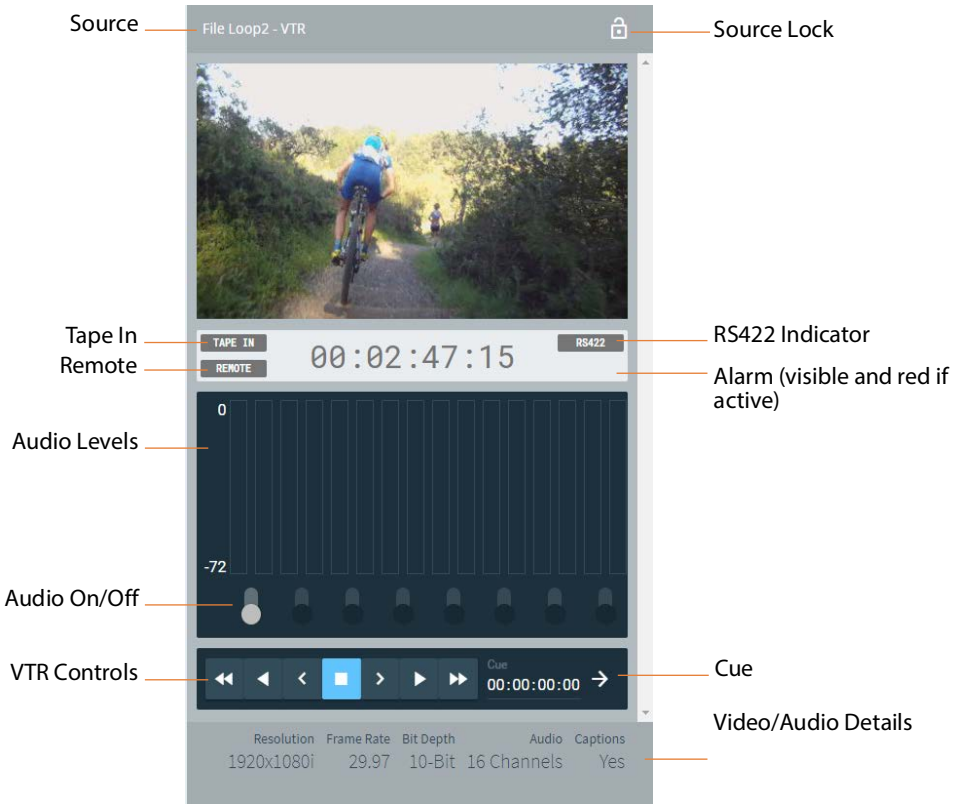


The time that has elapsed during the recording operation is displayed, along with a progress circle.

Using the Preview Player Panel

The Preview Player panel plays video and audio from the current VTR source so that you can locate and mark clips. The player includes these features:

- Includes audio level displays and controls for up to eight (8) stereo pairs
- Shows tape source video and audio details
- Contains a full set of VTR controls with standard keyboard shortcuts.



Source Display—The upper left corner displays the VTR source currently playing.

Source Lock—Click to lock the current source to your user account. When locked, the source cannot be controlled by other users. Click again to unlock (lock top opens). Note that you can forcibly unlock a source; a dialog states the user name and domain of the person who has reserved the source. The source is automatically locked when any RS422 transport control is in use.

Tape In Indicator—White indicates a tape is inserted; red TAPE OUT indicates the tape is not inserted.

Remote Indicator—White indicates VTR remote control; red LOCAL indicates local control.

RS422 Indicator—White when Tape Capture has VTR control; red NO RS422 when not in control (and Tape and Remote indicators are hidden).

Alarm—Red Alarm appears below RS422 only if a problem occurs with the source.

Audio Level Buttons and Displays—Click a button to turn an audio pair on or off. When on, a level display bar shows variations in the audio level.

Video/Audio Details—Displays video resolution, frame rate, bit depth, number of audio channels, and whether captions are present.

Cue—Cues video to the timecode you enter. Enter timecode and click the arrow to cue.

VTR Controls and Keyboard Shortcuts

The VTR controls operate in a standard fashion. Enter SHIFT+? to display the list of VTR keyboard shortcuts (shown below:

Buttons	Keyboard Shortcuts	Function
	i	Mark In
	o	Mark Out
	p	Log Clip
	j	Rewind (press 1-3 times to increase speed)
	[	Step Backward
	k	Stop
	]	Step Forward
	Space Bar	Play
	l	Fast Forward (press 1-3 times to increase speed)

Using the Tape Capture Web App

This topic explains how to perform typical tasks using the Tape Capture web application, and presents them in the order you usually follow to capture clips. The display indicator state for on/off controls is:

- Enabled
- Disabled

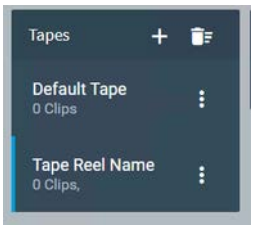
Setting up for Clip Logging

Before you begin logging and capturing, you must make preliminary selections:

1. Select a channel Group and VTR source in the upper left corner.
2. Select Workflows and then select a specific workflow from the list.
3. Configure capturing using the steps in the next topics.

Creating and Naming Tapes

Before you begin logging clips you want to capture, you should create tapes in the Tape Capture web app to match the tapes you plan to use in the VTR to capture clips:



1. In the Tapes panel, click the + (plus) button.
2. Enter tape information and press Enter.
3. Repeat to create as many tapes as needed for the clips you plan to capture.

The tape name is embedded in the output of the QuickTime and QuickTime Open container (and Avid MXF OP-Atom when generated by an Avid workflow via the Flip/Flip64 action) and is viewable in these applications: Final Cut Pro, Adobe Premiere Pro, and DaVinci Resolve.

In DaVinci Resolve, the Assist Using Reel Names... setting must be changed for the Tape Reel Name to display. Go to File > Project Settings > General Options and enable Assist Using Reel Names and set it to *Embedding in Source Clip File*.

To disable the propagation of the tape reel name, in the Tape action of the target workflow, check Disable Tape Reel Name.

Creating a Clip

To create a clip, make sure the VTR is connected and selected as the source, and follow these steps:

1. Insert the source tape for the clip into the VTR. The Tape In indicator on the Preview Player should be white.
2. Select a tape name in the Tapes list to associate the current clip with the tape.
3. Play or scrub the video using the VTR controls to find the point where you want your clip to start.
4.  Click the Mark In button in the Clip Panel to set the start timecode of your clip.
5. Play or scrub the video using the VTR controls to find the point where you want the clip to end.
6. Pick one of the two alternatives below as your next step:

    Click the Mark Out button to mark the ending timecode of your clip. The duration is calculated automatically.

   Optionally, instead of marking an out point, you can enter a duration after marking in, and the ending timecode is calculated for you.
7.  Click the metadata button to open the Configure Labels dialog to access and modify metadata contained in any Label added to the Tape action (if any).
8. Click Log to create the clip and add it to the Clip Log.

Configuring Clip Stitching

Clip Stitching direct-converts the source clips from multiple tapes, and arrange the clips in the order you want to stitch them in the output file. During capture, individual files are created of each clip. When capture from all tapes is complete, the output file is created with the clips in the order they were arranged in the Clip Ordering dialog.

To configure clip stitching, follow these steps:

1. Enable Clip Stitching in the Tape action, and then activate the workflow.
2. In the Tape Capture web app, create a clip list for each tape, either using manual IN/OUT/LOG or by importing an EDL. This is done for every tape to be included in the output file.
3. Select the Clip Ordering button to open the dialog that provides the ability to arrange the clips in the order that you want them to appear in the output file. The clips could be moved up/down either by drag/drop or by using up/down arrows.
4. Set the Timecode Override value, if desired. If Timecode Override is not enabled in the Tape action, the output clip has an initial timecode of 01:00:00;00.
5. Select any other configuration setting.
6. Select Capture.
   a. The Web app captures just like it does in the non-Stitching mode, by asking for the first tape by name and wait for confirmation that the tape has been inserted

into the VTR. After confirmation, the Web app controls the VTR and captures each of that tape's clips in linear TC order.

b. After all clips for the tape have been captured, the Web app prompts you to insert the next tape and the same process (step 6a) is executed. This process continues until all clips from all tapes have been captured into individual files.

7. When complete, the system generates an output file that contains all of the clips in the order that they were arranged in the Clip Ordering dialog.

Capturing Clips

When your clip log is complete (the list contains all the clips you want to capture), click the Capture button to open the Capture Clips dialog. Select the Configuration method and Output Location, and then click Capture.

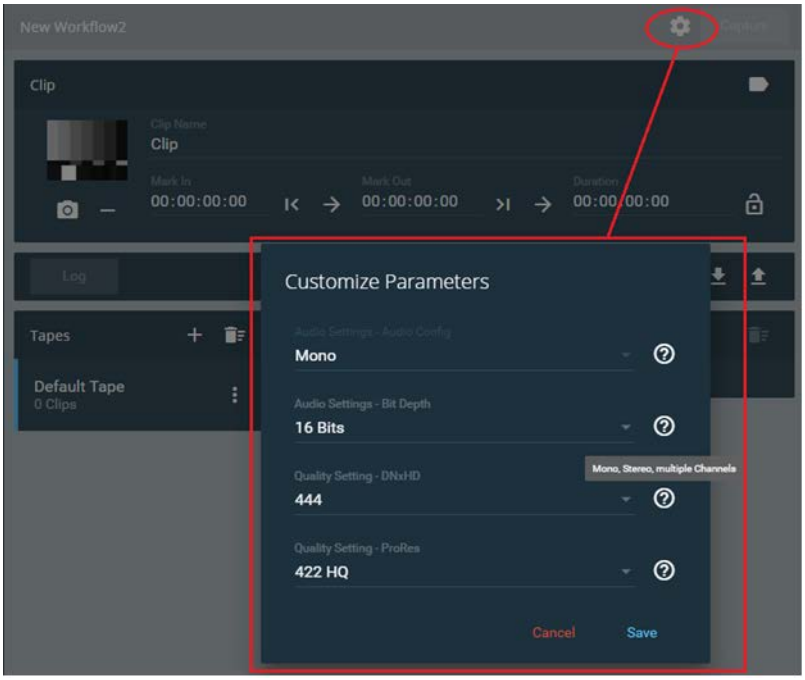
Tape Capture begins recording and capture the clips in the log into corresponding final output media files. For multiple tapes, the Tape Capture web app prompts you to insert the first tape when you start the capture.

If the *Rewind tape* setting is enabled, when all clips from the first tape are complete, Tape Capture sends the VTR a command to rewind the tape (Note that *Rewind tape* defaults to disabled.) The app also selects the next tape in the list, and indicates that a tape needs to be inserted. Then, insert the tape and press the *Capture* button to resume capture (the button displays yellow and reads *Resume*).

Configuring Tape Parameters that are Bound to Variables

You can configure parameters that are bound to a variable—or any variable added to the Tape action via the Add Variables menu— in the Customize Parameters dialog. To bind variables to a control, see *Binding Variables to Configuration Controls*.

Click the gear button next to the Capture button to display this dialog by:



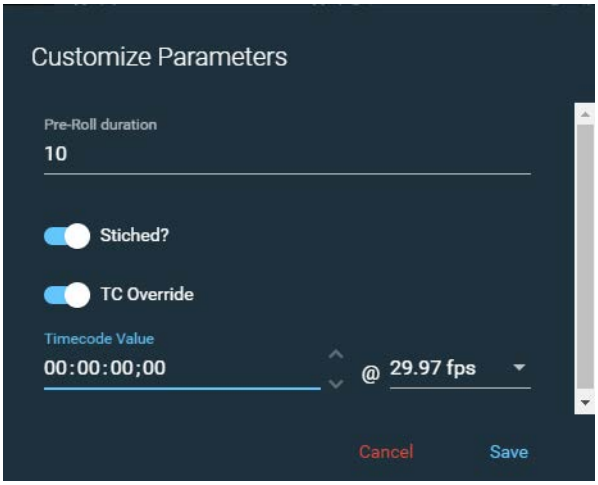
The question mark (?) provides a description of the variable, if one has been added.

Setting Drop/Non-Drop Frame Characteristics

You can change between drop frame and non-drop frame in the Customize Parameters dialog to change the characteristics of the captured file. For this option to be available in the Customize Parameters dialog you must have Timecode Override Enable activated in the Tape action, and have it bound to a variable. See *Creating Tape Capture Workflows* > *Settings Panel*.

To change between drop frame and non-drop frame:

1. Click the Gear icon to open the Customize Parameters dialog.



2. Enable TC-Toggle to enable timecode override.
3. Select 29.97 fps or 59.94 fps if you want to use drop frame. (Drop frame is only available for 29.97 fps or 59.94 fps.) Select any frame rate for non-drop frame.
4. Select the timecode by clicking it once or by selecting the line below it. When selected, the line and TC Override name displays in blue. (All numbers must be highlighted in white. If only one section of numbers is highlighted then you can not change between drop frame and non-drop frame.)
5. Type a semicolon ";" to set for drop frame, or a colon ":" for non-drop frame. The character should change in the timecode.
6. Click Save to save your changes and close the dialog.

When the capture is activated the output file uses the drop frame or non-drop frame characteristic you have set.

Creating a Stitched Clip

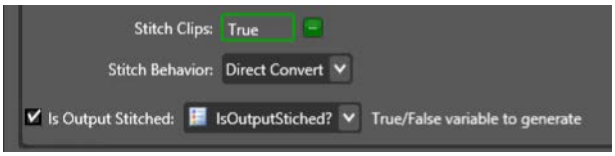
The Clip Stitching feature allows you to create a list of clips from one or more tapes, arrange the clips in the order in which they should be stitched together, capture all the clips to individual files, and then create a stitched output file (or files) containing all captured clips in the order specified.

Note: When clips or tapes have different frame rates, the job stops at the stitch location where the frame rate changes. Frames rates must be the same for stitch operations to complete successfully.

Follow these steps to create a stitched clip:

1. In Vantage Workflow Designer, open the Tape action to configure it. (See *Creating Tape Capture Workflows* for more details.)

2. In the Tape action Settings panel, enable the Stitch Clips option by binding it to a True variable. (To bind variables in the Tape action, see *Binding Variables to Configuration Controls*.)



3. In the Tape action, set the Stitch Behavior to Direct Convert and enable Is Output Stitched if required. See the Tape action *Settings Panel*.

Note: Clip Stitching is only supported for MXF OP1a, QuickTime, and MP4 outputs.

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4. When the Tape action workflow is configured, activate the workflow.
5. In the Tape Capture web app, create the list of clips you want to log, either by using the Mark In > Mark Out > Log method, or by importing an EDL file.
6. When your Clip Log is complete, select the Clip Stitch Order button to open the Clip Stitch Order dialog. Use the Clip Stitch Order dialog to arrange the clips in the order you want them in the stitched output file. You can re-order clips either by drag-and-drop or by using the up/down arrows next to each clip.

7. After the clips have been ordered, adjust any other parameters, as needed.
8. Click the Capture button to open the Capture Clips dialog. Select the Configuration method and Output Location, and then click Capture.
9. Tape Capture begins recording and capture the clips in the log into corresponding final output media files.

   With multiple tapes, Tape Capture prompts you to insert the first tape when you start the capture. When the tape completes, Tape Capture selects the next tape in the log list, and indicates that tape should be inserted. Insert the tape and click the

Capture button to resume the capture (the button displays yellow and displays Resume).

10. Once all individual clips have been captured from all tapes, the system automatically creates a primary output of individual clips and a stitched clip, or clips, depending on your workflow settings.
11. You can process the primary and secondary files by any downstream action in the same way they are in the non-stitched mode.

Recording an Entire Tape—Even if It Has Errors

Use the Whole Tape Capture button to record the entire tape, even if it has various errors, such as discontinuities in timecode, loss of the tape control track, or if alarms are triggered in the VTR.

Note: Abort on Discontinuity is ignored when you are capturing a tape using the Whole Tape Capture button.

To record the entire tape and ignore errors, click the Whole Tape Capture button  . Tape Capture automatically creates a single clip and enters Mark In and Mark Out timecode values that instruct the Tape Capture web app to capture the entire tape from the beginning of the tape to the ending of the tape. A dialog displays to confirm that you want to capture the whole tape. When you click CAPTURE, the tape is rewound to the beginning and captures the content on the whole tape until EOT (End of Tape) is reached.

Alternatively, without using the Whole Tape Capture button, you can set the Mark In timecode to 00:00:00:00 and the Mark Out timecode to 23:59:59:00. When you start the Capture recording process, the tape rewinds to the start (no matter where it was parked) and tape playback and recording starts. When the end of the tape is reached recording stops. Abort on Discontinuity is detected when using this tape capture method.

Note: The capture progress indicator does not function when capturing an entire tape, since the duration is unknown. However, you can observe the timecode display to confirm the current state. Although, with tapes that have no timecode or are without a control track the true state cannot be known. Direct observation of the VTR may be necessary.

Resolving Tape Capture Error Messages

A list of error messages and their resolutions is provided below.

Loss of Signal

If you encounter a loss of signal condition while capturing a clip with Tape Capture with Ignore Lost Frames in the Tape action in your workflow disabled, the logged clip fails with this error:

Event <Event Name> on <Channel Name> failed to capture. Loss of Signal detected. Error code = -19802. Data invalid.

You can avoid this by enabling Ignore Lost Frames in the Tape action.

Note: Enabling Ignore Lost Frames should not be necessary in most cases. When enabled, *all* input-related error messages are ignored without warning.

Creating Workflows for Live and Tape Media

Live Capture uses Vantage workflows to capture live media—both SDI and IP-based—as well as tape-based—and serialize it to files. Thus, you should know how to create, configure, and activate Live Capture Vantage workflows to utilize Live Capture effectively. Creating and configuring workflows is performed in Vantage Workflow Designer.

Topics

- Creating Live Capture Workflows
- Creating Tape Capture Workflows
- Using Paths for Vantage Storage
- Prototype Capture Workflow—Labels & Variables

The Vantage User Guide provides general information about topics related to creating and using Vantage workflows.

Creating Live Capture Workflows

Before you can use Live Capture to capture a live streaming source, you must create and activate a Live Capture workflow (you may have several, designed to meet different requirements) in Vantage, which uses the Capture action to serialize a live video source controlled from the Capture web app or from a Capture API-based program into a media file.

Topics

- Creating a Live Capture Workflow
- Capture Action Overview and Configuration
- Delivering Proxy Media to AWS S3 Storage
- Restricting Input - Frame Type and Frame Rate
- Expected Labels
- Configuring Trigger Settings
- Using the CalDAV Calendar Trigger
- Configuring Primary and Secondary Outputs
- Delivering Proxy Media to AWS S3 Storage

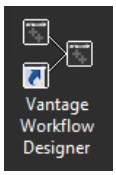
Creating a Live Capture Workflow

This topic describes the general process of creating and configuring a Capture action workflow.

This is a simple, example workflow. Your workflows may contain many more actions to implement your requirements. For configuration details, follow links or refer to online help directly in Workflow Designer.

Note: The Capture action is an Origin action. Only ONE Capture action is allowed in a Live Capture workflow. Workflow Designer displays the error "A workflow may contain only one Capture action" when you attempt to add the second Capture action to it.

Follow these steps to create and activate a Capture action workflow:



1. Launch Vantage Workflow Designer.
2. Select File > Create New Workflow and name the workflow. You may also want to create a Category (File > Create New Category), which is a folder where the workflow is stored. The default workflow naming pattern is [Workflow Name]_[Source Name].

Note: To avoid workflow failures, do not use these characters in workflow names:
` * | \ : ; " ' < > ? /

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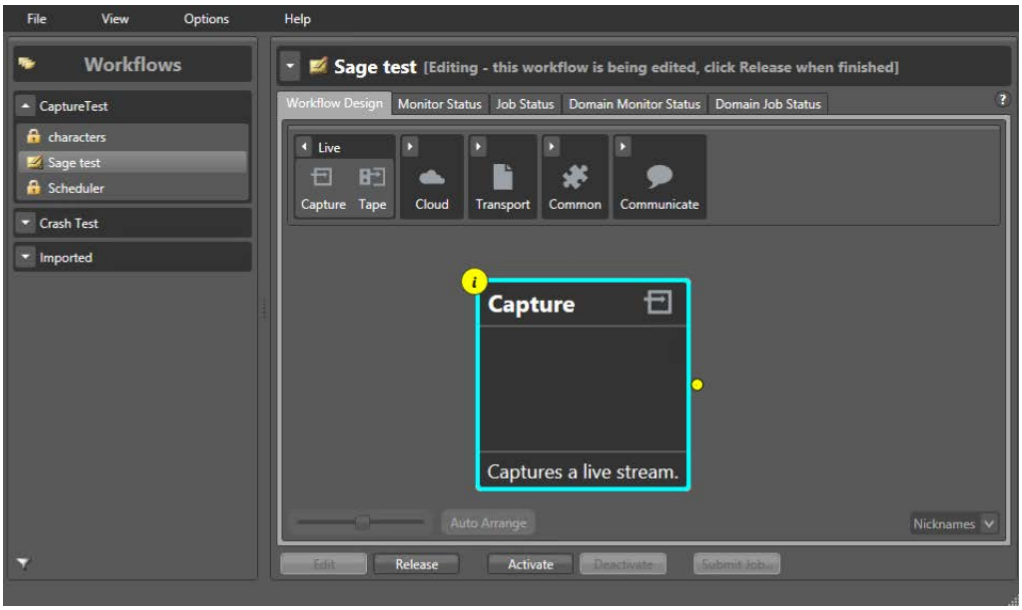
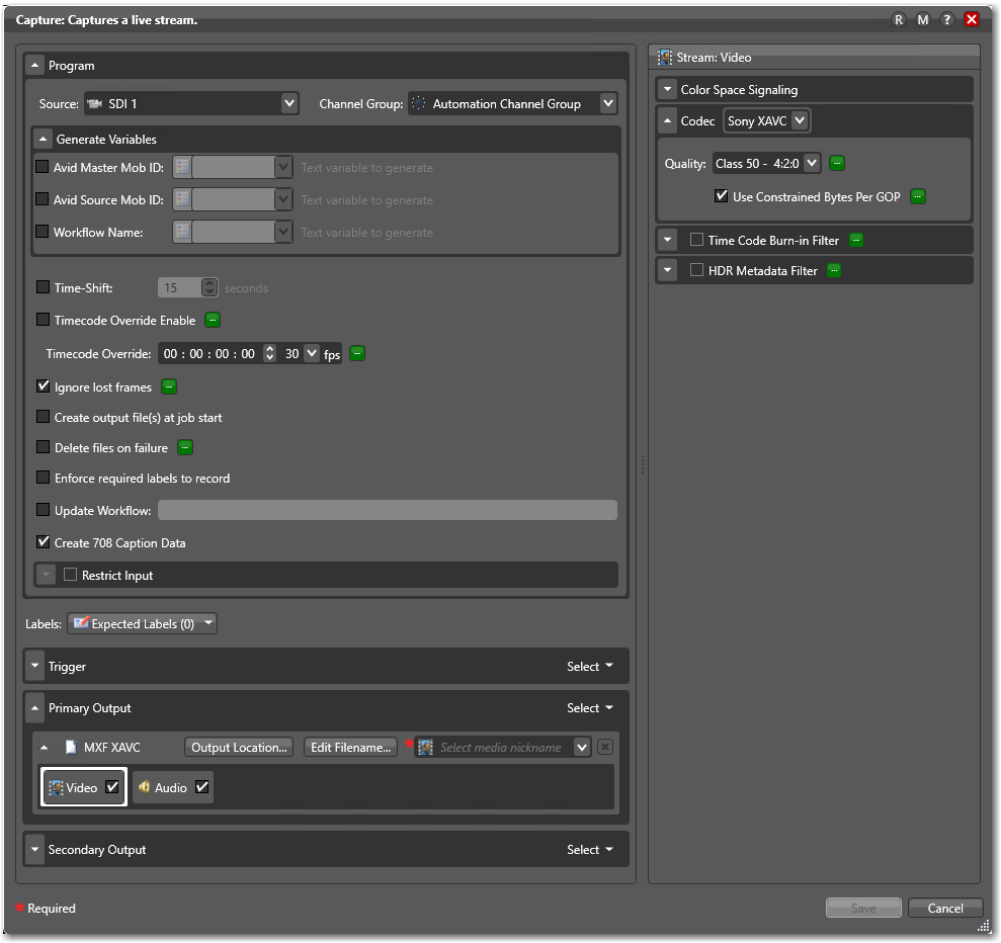
3. In the Workflow Design panel, open the Live action category and add a Capture action to the workflow design workspace:



4. Click the Inspector icon on the upper left corner of the action (or double-click the action) to open the Inspector.



5. Configure the action according to your requirements. For configuration details, see *Capture Action Overview and Configuration*.
6. Click Save when you finish configuring the action.
7. Click Activate to start the workflow so that it is ready to start jobs when directed to do so by the Live Capture web app.

Note: Job expiration is set for 24 hours and is enabled by default. For details, click the ? in the upper right to open the Vantage User Guide. See the *Viewing and Specifying Workflow Details* topic for information on adjusting the expiration time.

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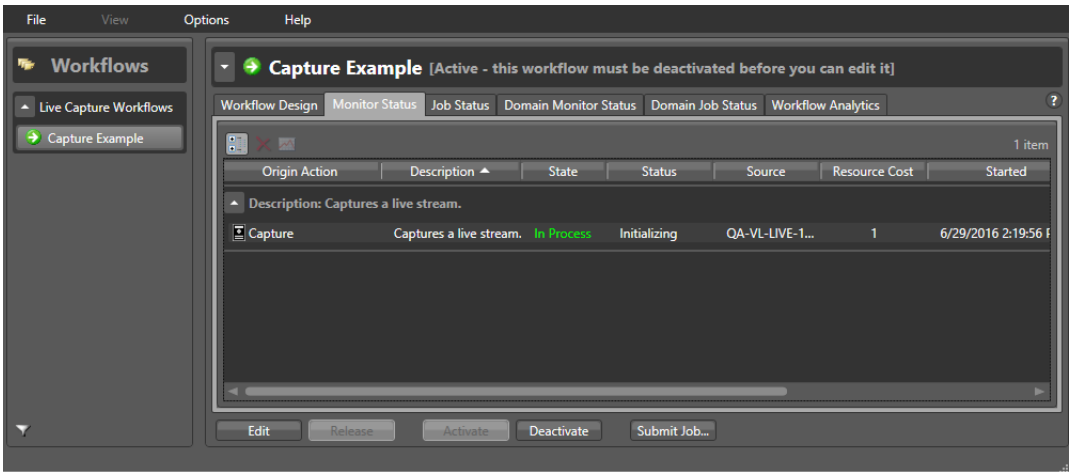
8. Display the Monitor Status tab to view the status of your workflow as it operates and provide details. Double-click a workflow for details:



When you activate a workflow, it begins to operate and communicate with the Live Capture or Tape Capture web application to accept the input you select, encode and package it into the format you specified in the workflow, and output the captured media package to the Live store location you specified.

There are many more ways to monitor your workflow. To learn more, click the ? icon or use the Help menu to open the *Vantage User Guide*.

Now, you are ready to log into the Live Capture web app and begin using it as explained in *Capturing Live Media*.

Capture Action Overview and Configuration

The Telestream Live Service and the Capture action are Vantage features enabled in a Vantage domain to support Live Capture and appropriately licensed. The Capture action is intended for use in conjunction with Live Capture, for the purpose of ingesting live and live-linear media directly into production, post production, and broadcast workflows and serializing it into a file for further, file-based video processing.

You use the Live Capture web application to capture selected live video streams being ingested by a Capture workflow executing in Vantage and encode and serialize the media into files.

You can also ingest live video streams and stream them back out on an IP network via SRT, for output monitoring and capture with external solutions.

Note: For SRT output, you are required to specify a file-based output location in the configuration.
After starting a capture that generates SRT output, for the SRT stream to successfully connect, the SRT receiver must be active within 15 seconds (the default timeout) of starting the capture. If the SRT output fails to connect, you must restart the capture.

You can use the Live Capture API to create custom programs to control Vantage capture workflows. Additionally, you can schedule and automate capture events using the Live Schedule Pro web app.

Live Capture ingests 3G and 12G SDI, plus RTMP, Transport Stream, SRT, NDI, and ST 2110 IP sources via the Telestream Live Service. The Capture action decodes the source to digital baseband in real-time for encoding and serialization. Sources are defined using the Live Source Manager web app.

Caution: Workflows containing more than one Capture action are not supported. When you attempt to add a second Capture action, Workflow Designer displays the error: A workflow may contain only one Capture action.

As an origin action, the Capture action can only be used to begin a workflow. It may optionally be the only action in the workflow. A capture workflow can also include additional actions to meet processing requirements, such as a Populate action or other transcoding (using a Flip action, for example). Or, it may contain Move or Copy actions, to replicate the captured file to other locations.

Note: Most MXF files, and QuickTime Open files are created in such a way that they can be opened for editing/playing while they are still growing during capture. Check with your edit/player application guide for details about supported formats.

The Capture action can operate in normal mode or Open mode. In Open mode, successive actions in the workflow execute concurrently as soon as the media is presented to it, dramatically speeding workflow execution. In workflows where actions execute normally (serially), the Capture action serializes the input stream and, when

recording stops, passes it to the next action (if any) in the workflow, an so on through all the actions in the workflow.

Live Capture workflows that are initiated with a Capture or Tape action can be executed in open mode. File-based workflows executed on a Capture system that are initiated with a Receive or Watch action require a Vantage Open Workflow license.

To enable Open mode on an action, right-click the action and select Workflow Mode > Open. (Open workflows must also be enabled in the workflow and in the Vantage Management Console). See user guides in Workflow Designer and the Domain Console for details.

The container and codec selected in the Capture action specify the encoding and format of the output file. The encoded media is captured to a primary file stored locally or copied to external SAN/NAS storage, also based on the Capture action configuration. At the same time, a secondary proxy file may also be configured and produced.

Note: Controls with a green Browse button may be bound to an input variable to dynamically assign their setting or value. The variable must have a value when this action executes. You can assign the value to the variable in a previous action in the workflow or use the variable's default value. Click Browse to select the variable or create a new one.

Configuring Program Settings

Use the Program panel to configure the Capture action to meet your requirements.

The Program panel displays the source selection, variables to generate, and controls.

Source. Specifies the input to use. For more information on Sources, refer to .

Channel Group. Specifies the name of the channel group this workflow is associated with. You can assign multiple workflows to each channel group (nexus) you create, and then use channel groups in your Capture web apps to filter workflow selections, narrowing your view of workflows to those that are relevant to your focus. Channel groups are managed in the Vantage Management Console, where they are referred to as Nexus definitions, in the Workflow Design Items > Nexus Definitions tab.

Generate Variables. Open this panel to specify which variables to generate for use in downstream actions:

Avid Master Mob ID 1 and 2 | Avid Source Mob ID 1 and 2. Check to update and publish the selected text variables to provide 1 or 2 sets of Master Mob ID and/or

Source Mob ID for use in a downstream Media Creation action, for Interplay check-in of assets.

Workflow Name. Check to update and publish the selected text variable to provide the name of this workflow.

Primary | Secondary File Path. Check to update and publish the selected text variable to the full paths for the primary and secondary container output.

Primary | Secondary Folder Path. Check to update and publish the selected text variable to provide the folder path for the primary and secondary container output.

Primary | Secondary Filename. Check to update and publish the selected text variable to provide the file name for the primary and secondary container output.

Start Timecode. Check to update and publish the selected variable to provide the starting timecode of the media.

Cue Mode. (Default: Disabled) If your application of this Capture workflow requires very low latency and ganged crash recordings with accurate start timecode, enable Cue mode.

Workflows with Cue mode enabled launch a Capture process upon activation instead of upon receipt of a Start Record command, reducing the time required to start recording significantly.

Typical use cases are ganged, multi-camera recordings such as studio productions, where recordings are designed to start within one second from a manual record action or an API trigger, and preview is ideally no more than a few seconds behind real time. The Stop command for ganged records is also designed to stop recording in under one second.

Start timecode for the first frame of file is identical across all channels when ganged.

In Cue mode, you can make any changes that are required before activating the workflow. After you activate a workflow, these limits apply:

- You can not edit sources - change file names - that are utilized by active workflows since they are in use.

- You can't modify variables - bound variables can only provide values that are present when the workflow is activated, to container and format components. If the value changes after activation, the new value is ignored.

Note: You should wait for a minute or two after channels stop before starting a new recording, so that the new process (or processes) associated with the workflow(s) are spun up again for continued Cue mode utilization. Don't serially create clips of extremely short duration - a few seconds, for example. Attempting to create multiple short clips in rapid succession, or performing repeated, rapid Record button pressing (*button mashing*) consumes significant CPU resources, preventing low latency from functioning as designed.

Auto Re-Cue. If Auto Re-Cue is enabled (default), the channel will be immediately returned to cue mode after a recording is completed. If Auto Re-Cue is not enabled, a channel will need to be recued at the conclusion of every recording

Cue mode allows for low-latency ganged crash recordings, and also allows you to set a Basename for the ganged recording from the Live Capture user interface. When a channel is in cue mode, recordings start quickly, generally one second or less after pressing the record button.

Similar to the Record option, choosing the Cue option starts a recording using the settings that have been provided. Cue mode takes five seconds per channel to initialize. While the cue mode is initializing, the channel thumbnail hides the Record Option controls and Record button and indicates in the status that it is cueing. During cueing, a recording cannot be started, and the settings for the cueing channels cannot be changed. When the channel is ready to start, the Record and Record Options buttons become available again, and the cued status is indicated with a blue background.

Time-Shift. (Legacy; use Cue mode) When enabled, allows ganged crash records to start all jobs on the same frame if time shift is applied, for manual trigger workflows only. This does not apply to recurring segment workflows, which have staggered start times. In a Capture workflow with Time-Shift enabled, the source input media frames are stored in a FIFO RAM buffer. This allows Live Capture to reach back in time and access media processed in the past, based on the value of the Time-Shift field. Since Live Captures Time-Shift is always processing a source input's media frames, when recording is initiated, each frame stored in the Time-Shift buffer is available to be added to the captured file.

The number of seconds set for Time-Shift in Capture actions associated with this source should be less than or equal to the Max Time-Shift set in the Live Capture Source Manager web app. See *Managing and Configuring Sources* in the *Live Capture User Guide* for more information on setting Max Time-Shift.

Generally, for HD up to 30fps, the total for all source Time-Shift buffers combined should not exceed 80 seconds. At rates above 30 fps, the total should not exceed 60 seconds. For UHD, the maximum should not exceed 10 seconds.

For accurate multi-channel recordings, use Cue mode rather than Time-Shift.

Timecode Override Enable. Check to enable override of the Input timecode with the one you enter in the Timecode Override control. When enabled, Timecode Override will override the Input timecode during a capture with the one specified and put this timecode at the beginning of the output file.

> **Timecode Override**. When Timecode Override Enable is checked, specifies the timecode value. Enter the timecode to put at the beginning of the output file.

Ignore Lost Frames. When enabled, this option suppresses all errors related to incoming video. It allows capture to continue recording if a Loss of Signal | FIFO overrun/overflow | Loss of RS422 condition is encountered or if video format changes are encountered. If disabled, the capture stops when it encounters these conditions. Enabling Ignore Lost Frames should not be necessary in most cases. For LOS details, see*Loss of Signal Behavior* in the *Live Capture User Guide*.

Delete files on failure. When enabled, the output files are deleted when a job fails or the workflow is deactivated while capturing. When not enabled, output files from failed

jobs are retained. Depending on the cause of the failure and type of file being captured, the output files from failed jobs may be usable to the point where capture stopped.

Enforce Required Labels to Record. When checked, when recording is started in the Capture web app, recording starts only if all label fields marked as required are not empty. If recording is prevented, an error displays indicating that the required label fields are empty. Update the fields in the label and retry. This feature is applicable to recordings started manually from the Live Capture web app only.

Update Workflow. Enable this control to allow operators to trigger update workflows during a Capture job. This starts a new workflow at the conclusion of this workflow, where the workflow name is entered in the text field. The workflow is often used in the case of post-Capture actions in the workflow failing or to update metadata and notify external systems, such as Avid Media Central. The target workflow must start with a Receive action and it must be active.

Create 708 Caption Data. (Default: enabled) When checked, 608 data is up-converted to 708 caption data. When unchecked, 608 data is not converted. The primary use case to disable this option is for SD broadcast formats that generally should not include 708 captions.

When creating QuickTime/QuickTime Open media using the 608 caption track in a QuickTime container, Create 708 Caption Data should be disabled.

Process Stagger Duration. (Default: disabled) When several jobs are submitted to Live Capture at the same time - particularly immediate (aka crash) recordings - the surge in resource requirements may cause one or more recordings to fail. Supply a unique value greater than zero for each Capture workflow to cause jobs that are submitted to the other workflows during the stagger duration period to have a delayed initialization.

For crash recordings, non-zero Process Stagger Durations are intended to delay the start time of some jobs, when multiple jobs are submitted simultaneously.

For example, crash recording jobs are submitted to three workflows in rapid succession:

- Workflow 1, with a Process Stagger Duration value of 3 seconds
- Workflow 2, with a Process Stagger Duration value of 5 seconds
- Workflow 3, with a Process Stagger Duration value of 0 seconds.

In this example, workflow 1 will initialize upon submission. Workflow 2 initialization is delayed by 3 seconds after workflow 1, because of the Process Stagger Duration value entered for workflow 1. Workflow 3 initialization is delayed by 5 seconds after workflow 2, because of the Process Stagger Duration value entered for workflow 2.

The Process Stagger Duration delays the initialization of the capture process, but not necessarily the start time of a timed job. Assuming a timed recording is submitted with an adequate buffer for initialization for all Capture Record processes to complete (approx. 30 seconds to one minute), the recording will be frame accurate with respect to the starting time code.

Hide Secondary Outputs (Default: disabled). When this control is enabled, paths to secondary outputs are not added to the Vantage binder for the job. This prevents

writing thousands of entries to the Vantage binder when creating ABR packages such as HLS and DASH, which adds load to the database without providing useful information. Note that there is an exception for HLS in that the manifest files (*.m3u8) are still added to the binder, but the *.ts fragments are not. This setting **must** be enabled for workflows using HLS and DASH outputs.

Restricting Input - Frame Type and Frame Rate

When enabled, the Capture workflow is restricted to a specific combination of frame type and frame rate. This setting applies only to the Manual trigger or any trigger that has Allow Manual Control enabled.

Select Frame Type. Specifies the frame type/size to use for the restriction.

Frame Rate. Specifies the frame rate to use with the selected frame type.

The following are the available combinations of frame type and frame rate:

- 2160p-4K: 23.98, 24, 25, 29.97, 30, 50, 59.94, 60

- 2160p-UHD: 23.98, 24, 25, 29.97, 30, 50, 59.94, 60

- 1080i: 25, 29.97, 30

- 1080p: 23.98, 24, 25, 29.97, 30, 50, 59.94, 60

- 720p: 50, 59.94, 60

- 625i-PAL: 25

- 525i-NTSC: 29.97.

Warning Only. Check when you want to start and stop manual recordings in the Live Capture web app with settings that do not match the selected restrictions. The warning message Format Mismatch displays on the channel card in the Live Capture web app, but recording continues.

Operation When Restrict Input is Enabled

When Restrict Input is enabled AND Warning Only is NOT enabled, the Record button and Gang Record icon are disabled when settings do not match. No recording can be started via the Capture web app. This restriction applies to the Manual trigger and any trigger that has the Allow Manual Control option enabled.

When Restrict Input is enabled AND Warning Only is IS enabled, manual recordings can be started and completed with settings that do not match the selected restrictions. The warning message Format Mismatch is displayed on the channel thumbnail card in the Capture web app, but recording will continue.

Automatic Triggers Record When Restrict Input is Enabled

Automatic triggers, such as Web Service, DAI Trigger, and CalDAV Calendar will record even when Restrict Input is enabled and settings do not match UNLESS they have the

Allow Manual Control option enabled. See Operation When Restrict Input is Enabled above for behavior when the Allow Manual Control option is enabled.

Expected Labels

Enable Labels to enable operators to update label values in the Live Capture web application and process them in the Capture action or downstream in the workflow. Labels can be used in downstream Vantage actions, typically to update or add properties in MAMs and NLEs, or transformed into text or XML for out-of-band delivery.

Labels that are enabled can be configured in the Live Capture web app Channel Options > Configure Labels dialog. Label creation and design is performed in the Vantage Management Console.

For more information on creating labels, search the *Live Capture User Guide* for *Create Labels and Variables for the Tape and Capture Actions*. To update Labels in the Live Capture web application, search for *Channel Options*.

Note: If label parameters are changed or modified in the Vantage Management Console, the changes need to be applied to Capture actions that use them, so that they display correctly in the Live Capture web app.
To apply label updates to a Capture action, you must:

1. Put the workflow into edit mode and display the Capture action inspector.
2. In Expected Labels, disable the target label(s); then re-enable them.
3. Save the action and re-activate the workflow.

Now, the updated label(s) will display correctly in the Live Capture web app.

Configuring Trigger Settings

Use the Trigger panel to select the method you want to use to control live video input, and to configure trigger settings.

You can implement the following triggers: DAI |Manual | Recurring Segment | CalDAV Calendar | Web Service. Proceed to the appropriate topic for configuration details, following.

Note: When you use Live Schedule Pro to schedule recordings, only Web Service, Manual, or Recurring Segment triggers are supported.

Select. Choose DAI |Manual | Recurring Segment | CalDAV Calendar | Web Service. Proceed to the appropriate topic for configuration details, following.

DAI Triggers

The DAI (Dynamic Ad Insertion) Trigger enables automatic recording to start and stop based on incoming SCTE-104 markers contained in the VANC data stream of the workflow's SDI input. Recording begins when a Start Program marker is detected and stops when an associated Stop Program marker with an Event ID that matches the Start Program's ID is detected. See details below.

You can not use DAI triggers with events created in Live Schedule Pro. You can only implement DAI triggers directly in the Capture action.

Single, unique files are created for each Capture event.

Note: A Time-Shift buffer of 10 seconds is required when using the DAI Trigger.

Start Preroll. Enable to set the number of frames to pre-roll the start trigger.

Stop Preroll. Enable to set the number of frames to pre-roll the stop trigger.

Default Start Behaviors for DAI Trigger

A recording is started by the Capture action when one of the following is seen attached to a sample on the source:

- SCTE splice insert data with Splice_Insert_Type = 3.

- SCTE time signal data with a segmentation type ID of 0x10 indicating Program Start.

Default Stop Behaviors for DAI Trigger

A recording is stopped by the Capture action when one of the following is seen attached to a sample on the source with the corresponding Event ID:

- SCTE splice insert data with Splice_Insert_Type = 1.

- SCTE time signal data with a segmentation type ID of 0x11 indicating Program End.

Select Rules File. Browse to select the XML rules file used to enable automatic recording to start and stop based on SCTE-104 markers.

Allow Manual Stop. When enabled, DAI jobs can be manually stopped via the Live Capture web application.

Note: SCTE-104 rules files can be complex. Best practice is to contact a Telestream Sales Engineer for details on configuring them correctly.

Manual Triggers

Select *Manual* to trigger video capture manually, using the Record button in the Live Capture web application.

Note: If you are using the Live Capture web application to control capturing, you must set the Trigger option to *Manual* so the web app can control the recording of input channels.
You can also use manual triggers when creating events in Live Schedule Pro.

Recurring Segment Triggers

The Recurring Segment trigger enables you to capture files of the time duration specified, from 5 minutes to 8 hours, and it repeats indefinitely. You control when to start recording and when to stop recording directly in the Live Capture web app, unless *Begin recording on workflow activation* is selected, in which case, recording starts as soon as you activate the workflow.

Live Schedule Pro now offers more advanced segmentation capabilities; customers using Live Schedule Pro should use the segmenting features rather than the Segmented Trigger type. Note that you can not use the two options together, but must choose either Live Schedule Pro segmentation or Capture segmentation.

Repeating segments are created based on your specified segment duration calculation method and the specified duration. The first and last segments captured may be a shorter time than the specified duration, depending on when the recording start and stop commands are initiated.

Port. Specify a port number (default: 19000) for the web service input that will trigger Live Capture. When activating multiple Capture workflows simultaneously, you must use unique ports. The program interacting with each workflow must be configured to use the same port number for execution of Capture operations.

Segment Duration. Specifies the time duration of recurring segments: 5 min. | 10 min. | 15 min. | 20 min. | 30 min. | 1 hr. | 2 hr. | 3 hr. | 4 hr. | 6 hr. | 8 hr. The default is 5 minutes.

Note: When you set the Primary Output of your workflow to use a QuickTime Open container, you should also set the Default Duration in the QuickTime Open general configuration to the same duration as the segment duration.

Duration Calculation Method. Specifies the method used to determine start and end points per segment: Midnight | Timecode | Duration.

Midnight - Segments are created on evenly-divided time boundaries starting at midnight, based on the duration selected. For example, if you specify a 15 minute segment, there are 96 divisions. The first segment stops at the next 15 minute boundary, and all repeating segments start and stop at 00:00, 00:15, 00:30, and 00:45. If you specify a 2 hour segment, there are 12 divisions, and the first segment stops at the next 2 hour boundary, and all repeating segments start and stop at 02:00, 04:00, 06:00, etc.

When capturing a recurring segment, Capture attempts to start new segments at the exact start of a minute, and the job name reflects this in the naming convention: record-HH:MM:SS:00. If the start time is only an estimate, the name reflects the estimated start time of the segment, and the delineation for seconds is omitted from the name: [base name]-~HH:MM. If the service fails to retrieve a time code but the source is not in a LOS state, the name is [base name]-initial.

1 hour example:

Recurring Segment duration=1 hour

Segment 1 start=current timecode

Segment 1 end= xx:00:00:00 (where xx is the next hour, mark out point exclusive)

Segment 2 start=xx:00:00:00 (where xx is the next hour, mark in point inclusive)

The result is that all segments are the selected duration based on timecode, except the first segment and the last segment, if it is ended arbitrarily.

Timecode - use when you want the start time code of the first segment to be the current timecode, and then advance the timecode by the segment duration you specified to determine the segment end point.

For example:

Recurring Segment duration=1 hour

Current Timecode = 08:00:03;22

Segment 1 start = 08:00:03;22

Segment 1 end = 09:00:03;22 (exclusive out point)

The result is that the duration of all segments are determined by timecode, except the last one if it is ended arbitrarily.

Duration - use when you want the duration of each segment to be measured in frames, rounded to the nearest whole frame (an integer value). It is calculated using the specified segment duration at the video frame rate, taking into account drop frame or non-drop frame. This ensures that all segments have the same frame count. For example, a 5 minute duration segment at 29.97 is 8991 frames.

Begin Recording on Workflow Activation. When checked, a job starts and begins recording immediately upon workflow activation.

Enable File Count Naming Pattern. When checked, a numeric string is added after the base filename string, based on the number of digits you specify. The string starts at 1 and increments for each segment recorded.

Number of digits in file name. Specifies the number of digits in the incrementing file count string being applied to the current segment filename. For example, if you set it to 4, files are specified as `basefilename.0003.mxf`.

CalDAV Calendar Triggers

The CalDAV Calendar Trigger enables you to record based on events on a CalDAV-compatible calendar. For detailed instructions, see *Using the CalDAV Trigger* below.

You can not use CalDAV Calendar triggers when creating events in Live Schedule Pro.

Note: When using the CalDAV Calendar Trigger you must set your TimeCode Source in the *Vantage Management Console* to either *Computer Clock* or *Source*. When using *Source*, you must have time-of-day timecode in your source that matches the time set in your Live Capture server.

Calendar. Enter the URL to the CalDAV calendar you want to use.

Username. Enter the email address you use for your CalDAV calendar.

Password. Enter the password you use to sign in to your CalDAV calendar.

Send Calendar Status Notification Emails. Check this option if you want to have an email sent when Capture is able to successfully connect to the CalDAV calendar upon workflow activation, or when connection to the URL goes online, and when the calendar goes offline. The email goes to the address configured in the Vantage Management Console for the *Administrator Email Address*. If you have not received a notification email, check your spam folder, and then check your Vantage configuration.

Note: The email address for notifications must be properly configured in the *Vantage Management Console* > *Settings & Options* > *Email* tab. See the *Vantage Domain Management Guide* for detailed instructions.

Allow Manual Control. (*Use caution when enabling the Manual Trigger control.*) When enabled, manual control via the Live Capture web application is allowed. Jobs can be immediately started using the manual controls in the same way as with the Manual Trigger.

In addition, scheduled jobs that have been added to the schedule record queue can be stopped and removed from the job queue. When a manual stop is issued, all scheduled jobs that are currently queued or are in the process of being recorded will be removed from the schedule queue. Jobs currently recording will be stopped and removed from the queue. New events added to the calendar will be added to the queue if they are within the 1-hour queue window.

If a CalDAV Calendar Trigger workflow is deactivated then reactivated, any scheduled events on the calendar that are within the 1-hour schedule queue window will be added to the scheduled capture queue regardless of any previous manual control.

Web Service Triggers

Select Web Service to trigger live video capture in a custom program, using commands from the Live Capture API. You can queue up a maximum of 16 Web Service trigger jobs per Live Capture server at any one time.

You can also use Web Service triggers when creating events in Live Schedule Pro.

Port. Specify a port number for the web service input that will trigger Live Capture or leave the default, which is 17000. When running multiple Capture workflows simultaneously, you must use unique ports. The program interacting with each workflow must be configured to use the same port number for execution of Capture operations.

Note: Do not use port numbers 8083, 8084, 8089, 8090, 15000, or 18000 for the Web Service input port. An error message does not appear when activating a workflow set to these ports, but the Web Service Trigger will not function.

Create Metadata Log. When enabled, metadata log files are created that include frame numbers, the timecode value of each frame, and RS422 status (when RS422 is enabled). The log file is written to the output location along with the primary output.

Allow Manual Control. (*Use caution when enabling the Web Service manual control.*) When enabled, manual control via the Live Capture web application is allowed, in addition to capture via the Live Capture API. Jobs can be immediately started using the manual controls in the same way as with the Manual Trigger.

In addition, web service jobs that have been added to the web service record queue can be stopped and removed from the job queue. When a manual stop is issued all web service jobs that are currently queued or are in the process of being recorded will be stopped and removed from the web service queue.

Using the CalDAV Calendar Trigger

The CalDAV Calendar Trigger enables you to capture video based on events in a CalDAV calendar. When using CalDAV Calendar Trigger:

- Each event must be at least 15 minutes in duration, or greater.

- Event durations are restricted to a maximum of 9 hours. Events that are longer will stop recording automatically at 9 hours duration.

- Event names cannot contain an accent grave character or any of the following characters: * | \ : ; " ' < > ? /

You can not use CalDAV Calendar triggers when creating events in Live Schedule Pro.

Note: You must use a calendar that is dedicated to *only* contain events that are used for Live Capture. All events in the calendar are used for Live Capture, no matter what name they are given or other purpose they are intended for.

What Happens When a Queued Event is Deleted

If an event on the calendar has been added to the Capture queue (events are queued up when they are within 1 hour of their start time) and is subsequently deleted from the CalDAV calendar, its job status is reported as Complete in the *Workflow Designer* and the *Job Status Views* application.

- In the case where the deleted event had not yet started capturing, a 0K (zero K) sized file associated with the job will remain in the workflow's output folder location.

- In the case where the deleted event was in a capturing state when it was deleted, a playable file associated with the job will remain in the file's output folder location.

See *Using the Job Status Views* in the *Live Capture User Guide* for more information on using this application.

Configuring Primary and Secondary Outputs

When you select SRT streaming output, specify the server, mode, and password in the details panel.

Note: AVC and HEVC uses the NVIDIA GPU which is not available on CPU-only systems. Interlaced output is not supported for GPU encoding, but if interlaced source is used, you can apply the de-interlace filter to produce progressive, GPU-encoded output from an interlaced source.

When you select an output file format, specify the output location, file name and nickname settings. Select the output location where the captured file should be written, optionally edit the file name using tokens or variables, and specify the output nickname for use by downstream actions operating on the file.

Output Location. Click Output Location and select from these choices.

- *Vantage Store*: Write the output to a Live Store. Select a Live Store from the menu.

At least one Live Store and one File Store per Capture server is required in Vantage, for use as the output location for Capture operations. See Live Capture User Guide > Using Live Stores for Capturing Files for details.

- *Path*: Write the output to a specific Windows file system. Manually enter a Windows share (UNC path) or drive letter (not recommended on Vantage arrays) or click Browse to navigate and select the location. Or, click the green Browse button and select a variable which supplies the fully-qualified path.

Caution: In rare instances, two capture processes writing to the same path location folder may result in one file overwriting the other. To prevent this, the best practice is to use a unique folder location for each workflow, or append a Time token (set to mmm) to the file name in a workflow (configured in Edit Filename), which returns the current millisecond, thus altering the file name.

Edit Filename. Displays the Filename Pattern Editor and specifies the pattern for the file you are creating. Default: Workflow Name - Source Name. Use the menu on the right to select one or more tokens to insert to create the exact filename pattern you require.

Available tokens:

- Base Name: Customizes the output file name with a name you enter in the Live Capture web application, or when passing a name token from the Live Capture API or CalDAV Calendar trigger.

- *Workflow Name*: Adds the name of the workflow as part of the file name.

- *Source Name*: Adds the name of the live source as part of the file name.

- *Variable*: Choose and add a variable to the file name.

- *Date*: Adds the date as part of the file name.

- *Time*: Add the time as part of the file name.

Note: The time applied to the Time token represents the time that the output file is created. Files are initialize at different times based on the Trigger type being used.

The variable token is replaced by the value it holds when the action executes. The variable should be set prior to execution of this action. For example, if a variable token named *ISCI* is given the value `12H4JA678`, wherever the ISCI variable token appears in the filename pattern it is replaced with that value.

Select Media Nickname. Select the nickname (or enter it manually) for this package file.

Add. Create a new Configuration Template by first choosing the template's output container format from the Add menu. Specify a container type by entering a unique name in the container Config Name field and configuring container details in the panel on the right. Now, click on the video and audio streams on the left and configure them as well, in the panel on the right. Add all of the output configurations that you want to have available in the Live Capture web app.

After logging clips, click the Capture button in the Live Capture web app to select the primary output container format you want to use for the capture operation.

Delete. Click the X icon on the right to delete the output from this action.

Note: In addition to primary and secondary outputs, you can add a tertiary output. To add a tertiary output, click the Select dropdown in the upper right corner of the Secondary Output area, then press CTRL + SHIFT while clicking the output type. The tertiary output appears within the Secondary Output area.

Delivering Proxy Media to AWS S3 Storage

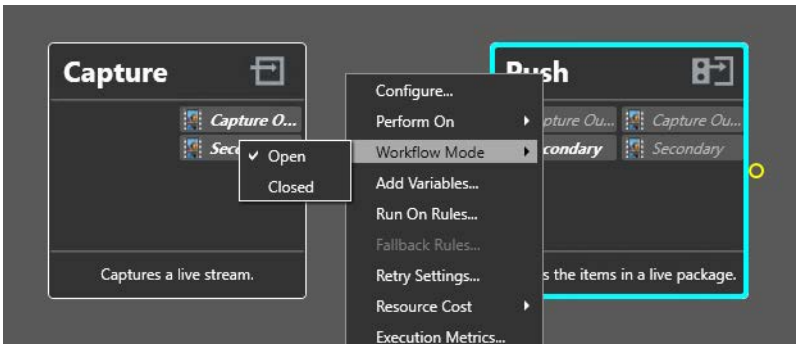
In addition to writing secondary output to your Capture server during transcoding, you can also deliver the Capture action's secondary proxy output HLS | DASH media to AWS S3 remote object storage.

Using the Push Action

You can use the Push action to write HLS | DASH media from the secondary output of an open, Capture-based workflow to AWS S3 in real-time, where segments and manifest/playlist files are pushed to S3 as soon as they are written or updated during Capture job execution in Open mode.

Note: Push actions are intended for use in Capture workflows, and should always be configured to operate in Open mode to write secondary HLS | DASH output to AWS S3 storage.

To deliver media to AWS S3 object storage, add a Push action immediately following the Capture action:



Configure the Push action with your AWS account information: region, bucket, target path, and credentials. For configuration details, see the man page—click the M button in the inspector's toolbar.

Finally, right-click on the Capture and Push actions and set them to Open mode, as shown in this figure.

Note: Open Workflow mode must be enabled in the Vantage domain—in the Vantage Management Console, Select Settings & Options, and in the General tab, check Enable Open Workflows. The workflow itself must the open mode enabled as well. In Workflow Designer, display the Workflow Details panel (click the disclosure button to the left of the workflow's title bar) and check Open mode.

Using the Deploy Action

You can also use the Deploy action in Closed mode, to write proxy media from the secondary output of the workflow to AWS S3 after the Capture action has completed.

Creating Tape Capture Workflows

Before you can use the Tape Capture web application or API to capture tape-based media to a file, you should create and activate one or more tape capture workflows as needed, each of which uses the Tape action to make a video source available for Capture web app or API control.

Note: Only ONE Tape action is allowed in a Tape Capture workflow. Workflow Designer displays the error "A workflow may contain only one Tape action" when you attempt to add the second Tape action to it.

Topics

- Tape Action Overview and Configuration
- Labels
- Configuring Primary and Secondary Outputs
- Settings Panel
- Creating a Tape Capture Workflow

Tape Action Overview and Configuration

The Telestream Live Service and the Tape action are Vantage features enabled in a Vantage domain to support Live Capture and appropriately licensed. The Tape action is used in workflows created for ingesting tape-based media via SDI in the Lightspeed Live Server and serializing it to files for further video processing.

You use the Lightspeed Live Tape web application to select sources and control recording during playout. You can also use Live Capture API to create custom programs to control Vantage capture workflows.

The Tape action is used to start SDI-based tape capture workflows created in the Vantage domain installed on the Lightspeed Live server. The Tape action inspector enables you to select and configure VTR sources for processing, filtering, transcoding, and output. You can also use the action to add metadata labels.

The container and codec selected in the Tape action allow configuration of the encoding and format of the capture operation. The encoded media is captured to a primary file stored locally or copied to external storage.

Note: Most MXF files, and QuickTime Open files are created in such a way that they can be opened for editing/playing while they are still growing during capture. Check with your edit/player application guide for details about supported formats.

As an origin action, the Tape action in a Vantage workflow begins the workflow, and it may be the only action in the workflow. A tape capture workflow may also include additional actions, such as a Copy or Move action, which can be optionally used to output the captured file to an additional location.

Use the Live Tape Capture web application to control VTR sources from the VTR Preview Player panel, log clips from tapes, and capture logged clips from tape to files. For information about the Live Capture web application, please see the *Live Capture User Guide*. The Live Capture API can also be used to create custom programs to control tape capture workflows.

This action is open workflow capable if the Open Workflows license is installed; right-click the action and select Workflow Mode > Open. Open workflows must also be enabled for the current workflow and in the Vantage Management Console Settings.

Note: Controls with a green Browse button may be bound to a variable to dynamically assign their setting or value. The variable must have a value when this action executes. You can assign the value to the variable in a previous action in the workflow or use the variable's default value. Click Browse to select the variable or create a new one.

Sources

Configure inputs and outputs on the left side of the inspector.

Source Inputs

Source. Select the input to use from the Source menu. For more information on Sources, refer to .

Channel Group. Specifies the name of the Group this workflow is associated with. You can add multiple workflows to each channel group you create, and then use channel groups in your Capture web apps to filter workflow selections, narrowing your view of workflows to those that are relevant to your work or focus. Channel Groups, which are referred to as Nexus definitions in the Vantage Management Console, are created and managed in the Workflow Design Items > Nexus Definitions tab.

Labels

Select the Labels that you want to include, to allow operators to update label values in the Tape Capture web application and process them in the Tape action or downstream in the workflow. Labels can be used in downstream Vantage actions, typically to update or add properties in Interplay, or transformed into text or XML for out-of-band delivery.

Labels that are enabled can be configured in the Tape Capture web app - select the Channel Options > Configure Labels dialog. Label creation is performed in the Vantage Management Console.

For more information on creating labels, search the *Live Capture User Guide* for *Create Labels and Variables for the Tape and Capture Actions*. To update labels in the Live Capture web application, search for *Channel Options*.

Note: If label parameters are changed or modified in the Vantage Management Console, the changes need to be applied to Capture and Tape actions that use them, so that they display correctly in the Tape Capture web app.
To apply label updates to a Capture action, you must:

1. Put the workflow into edit mode and display the Capture action inspector.
2. In Labels, disable the target label(s); then re-enable them.
3. Save the action and re-activate the workflow.

The updated label(s) will now display correctly in the Tape Capture web app.

Configuring Primary and Secondary Outputs

You use the Primary and optional Secondary Output panels to create configuration templates that you can select in the Tape Capture web app.

The output location, file name and nickname settings are set once for all primary and secondary configurations. Select the output location where the captured file should be written, optionally edit the file name using tokens or variables, and specify the output nickname for use by downstream actions operating on the file.

Configuration templates can be added to each output type and consist of a container format and the video and audio codecs to be use for the captured output. There is no limit to the number of configuration templates you can create.

Output Location. Click Output Location and select from these choices:

- *Vantage Store*: Write the output to a Live Store. Select an available Live Store from the menu.

Telestream recommends creating a Live Store in Vantage and using it as the output location for efficient Capture operations. See Live Capture User Guide > Using Live Stores for Capturing Files for details.

- *Path*: Write the output to a specific Windows file system server and directory. Manually enter a Windows share (UNC path) or drive letter (not recommended on Vantage arrays) or click Browse to navigate and select the location. Or, click the green Browse button and select a variable which supplies the fully-qualified path.

Caution: In rare instances, two capture processes writing to the same path location folder may result in one file overwriting the other. To prevent this, the best practice is to use a unique folder location for each workflow, or append a Time token (set to mmm) to the file name in a workflow (configured in Edit Filename), which returns the current millisecond, thus altering the file name.

Edit Filename. Displays the Filename Pattern Editor and specifies the pattern for the file you are creating. Default: Base Name. Use the menu on the right to select one or more tokens to insert to create the exact filename pattern you require.

Available tokens:

- *Base Name*: Select to add the base (clip) name as part of the file name. The Base Name token is populated with the Clip Name selected in Clip Panel of the Tape Capture user interface.

- *Workflow Name*: Select to add the name of the workflow as part of the file name.

- *Source Name*: Select to add the name of the live source as part of the file name.

- *Variable*: Select to choose and add a variable to the file name.

- *Date*: Select to add the date as part of the file name.

- *Time*: Select to add the time as part of the file name.

The Variable token is replaced by the value it holds when the action executes. The variable should be set prior to execution of this action. For example, if a Variable token named ISCI is given the value `12H4JA678`, wherever the ISCI variable token appears in the filename pattern it is replaced with that value.

Select Media Nickname. Specifies the nickname for this media.

Add. Create a new Configuration Template, by first choosing the template's output container format from the Add menu. Specify a container type, enter a unique name in the container's Config Name field and configure container details in the panel on the right. Now, click on the video and audio streams on the left and configure them as well, in the panel on the right. Add all of the output configurations that you want to have available in the Tape Capture web app.

After logging clips, click the Capture button in the Tape Capture web app to select the primary output container format you want to use for the capture operation.

Delete. Click the X icon on the right to delete the output from this action.

Settings Panel

Specify Tape action general settings in the Settings panel on the right.

Binding a parameter to a variable makes the parameter configurable directly in the Tape Capture web app.

Generate Variables

Generate Variables. Select which variables to generate for use in downstream actions.

Is Output Stitched. When checked, enables the ability to detect if the output is stitched or not. Select or create a True/False variable to generate, which is used in a downstream action to execute the workflow based on the result. (Use a Decide action to test the variable and perform one branch or another.)

Primary Configuration. When checked, generates the specified variable to enable downstream actions to determine which configuration was used in this action. The variable contains the primary configuration that was selected by an operator for this job, in the Record panel of the Tape Capture web app, which is selected from the menu that displays all of the primary configurations you have configured here in the Tape action to be available to the operator during tape capture operations.

Secondary Configuration. When checked, generates the specified variable to enable downstream actions to determine which configuration was used in this action. The variable contains the secondary configuration that was selected by an operator for this job, in the Record panel of the Tape Capture web app, which is selected from the menu that displays all of the secondary configurations you have configured here in the Tape action to be available to the operator during tape capture operations.

Avid Master Mob ID | Avid Source Mob ID. Check to generate variables to provide the Avid Master Mob ID and/or the Avid Source Mob ID for use in downstream actions. Then select the text variable you want to generate.

Workflow Name. Check to generate variable to provide the name of this workflow for use in downstream actions. Then select the text variable you want to generate.

Tape Action Settings

Configure these Tape action settings:

Ignore Lost Frames. When enabled, this option suppresses all source and load-related errors. It allows capture to continue recording if a Loss of Signal | FIFO overrun/overflow | Loss of RS422 condition is encountered or if video format changes are encountered. If disabled, capture stops when it encounters these conditions. Enabling Ignore Lost Frames should not be necessary in most cases. For LOS details, see .

Pre-Roll Duration. Specifies the number of seconds that tape rolls before a scheduled recording begins. You can also assign a variable defined elsewhere in the workflow.

Note: Setting Pre-Roll Duration to 0 (zero) may have a use in some cases, such as capturing digital sources. A 0 (zero) setting could cause issues when capturing from tape sources. The default Pre-Roll is 3, which often works fine for a tape source.

Post-Roll Duration. Specifies the number of seconds that tape rolls after a scheduled recording ends. You can also assign a variable defined elsewhere in the workflow. Note that the VTR stops only after all frames have been captured, so post-roll may continue longer than the duration you specify.

Timecode Override Enable. When checked, activates and overrides the Input timecode with the one entered in the Timecode Override control. When enabled, Timecode Override overrides the Input timecode during a capture with the one specified and puts this timecode at the beginning of the output file. All clips in the Tape clip list will have their timecode overwritten by this timecode.

Timecode Override. Specifies the timecode value to use to put at the beginning of the output file when Timecode Override Enable is active.

Discontinuity Threshold. Specifies the minimum number of skipped frames that constitutes a discontinuity (timecode break) state. This threshold affects both Create New File on Discontinuity and Abort on Discontinuity, when enabled. Note that decremented and repeated frames always count as timecode discrepancies, and for these discrepancies, the threshold setting is ignored.

Discontinuity Cooldown. When checked, delays discontinuity checking for the specified time. After a discontinuity is detected, additional discontinuities are ignored until the specified time (in seconds) has passed.

Create New File on Discontinuity. When checked and timecode discontinuity is detected, specifies that the current media file is closed and a new media recording file is opened. During an active capture recording, if a discontinuity is encountered, the current capture file will complete, and a new media file recording will immediately start.

Time code discontinuities are defined as follows:

- Time code increments: If time code increments by a value equal to or greater than the selected Discontinuity Threshold value.

- Time code repeats: The Discontinuity Threshold value is ignored in this case.

- Time code decrements: The Discontinuity Threshold value is ignored in this case.

Example 1: A time code incrementing from 00:00:30;10 to 00:00:30;15 would be detected by a threshold of 4 or less.

Example 2: A time code repeating from 00:00:30;10 to 00:00:30;10 would be detected.

Example 3: A time code decrementing from 00:00:30;10 to 00:00:29;00 would be detected.

Abort on Discontinuity. When enabled, capture aborts when a timecode discontinuity is detected as specified by the Discontinuity Threshold or when the VTR servo is not locked.

Note: Create New File on Discontinuity and Abort on Discontinuity options are mutually exclusive; when both are checked, Abort on Discontinuity takes precedence. That is, if discontinuity is detected, the job is aborted.

Ignore Frames When Servo is Not Locked. If enabled, all frames captured while the servo is in the unlocked state (as reported by the VTR) are excluded from the output file.

Create New File When Servo Relocks. If enabled, creates a new media file when the servo relocks after being in the unlocked state. When a servo relock is encountered during an active capture recording, the current capture file will complete, and a new media file recording starts.

If Create New File When Servo Relocks is enabled and Ignore Frames When Servo is Not Locked is disabled, the system may create unwanted (unlocked) frames at the end of output files.

If Create New File on Discontinuity is enabled and Ignore Frames When Servo is Not Locked is also enabled, the result may be an output file that contains a discontinuous timecode, even though Create New File on Discontinuity is enabled and the timecode was always incrementing. This occurs because of the system ignoring frames, regardless of the timecode, while the servo is unlocked. With this configuration, the frames captured during the period when the servo was unlocked will be excluded from the output file. New frames would then be added to the file when the servo relocks, which would cause the output file to have discontinuous timecode. To avoid this scenario, enable the Create New File When Servo Relocks option. In this state the relock of the servo will start a new file where the discontinuity in the output file would have been.

As described above, repeating timecodes are counted as discontinuities. Most VTRs repeat timecodes when the servo is unlocked; therefore, if Ignore Frames When Servo is Not Locked is disabled and Create New File on Discontinuity is enabled, the result may be many single frame files while the servo is unlocked. This will not happen if Ignore Frames When Servo is Not Locked is enabled.

With many VTRs, particularly an SRW-5800, there can be gray frames after the servo relocks. Timecode for these frames is often invalid. Because the system is only able to respond to the status the VTR provides, it will not detect and exclude these gray frames.

No two passes of the same section of tape are likely to be identical. This occurs because the VTR can sometimes take longer than others to lock the servo after the control track is detected. Therefore, it is important to check the logs to verify whether the servo was locked while a specific frame was captured.

Use Duration Over Markout. Ignores mark out and rolls tape for the specified duration regardless of time code.

Treat input as Progressive. Assumes input is progressive even if it is interlaced.

RS422 time code delay. Adjusts RS422 time code by specified number of frames. RS422 time code delay can be used to compensate for VTR decks requiring adjustments to frame timing. Most VTR decks do not require this offset adjustment. If you have a VTR deck that requires this adjustment it is necessary to use a trial and error process to determine the correct offset. The default is 0, the minimum is -3 frames, and the maximum is +3 frames.

Rewind Tape. When checked, a Rewind command is sent to the VTR after capture is complete. If there are multiple clips on a tape slated for capture, the Rewind command is sent once; after all clip capture jobs have completed.

Stitch Clips. When checked, stitches the aggregated content from all captured clips into a direct-converted output file. See Stitch Behavior, below.

Stitch Clip Base Name. Specifies the base name to use in job names and the *Base Name* part of the file name pattern. When blank, `StitchedClip` is the default base name.

Stitch Behavior. Specifies the stitched file behavior: *Direct Convert*, which can not be changed. Creates a self-contained output file for the Primary and/or Secondary outputs, which contains the aggregated content from all captured clips in the order specified by the user.

The output file can be used by a downstream action for additional processing.

Allow Secondary Output to be Disabled. Check to add the option to disable the secondary output in the Tape Capture web application. When selected, the Disable Secondary Output control is displayed in the Tape Capture web app Capture Clips dialog.

Note: When *Allow Secondary Output to be Disabled* is selected, no downstream processing can be performed on secondary output. With this enabled, you cannot save the workflow if it is set to process secondary output.

When you have downstream actions process secondary output, but you want to disable secondary output in the Tape Capture web app, add a Poster Frame secondary output so that can be selected in the web app as the disabled option.

You must create one or more MP4 secondary outputs when Allow Secondary Output to be Disabled is selected, in order to have the option to enable and create a secondary output in the Tape Capture web app.

Time Code Burn-in Filter

Check to enable this filter and configure it. The Time Code Burn-in filter writes the current value of the time code into the video frame at the specified location and font size, typically for use in proxy files.

Controls with a green Browse button can be specified dynamically, on a job-by-job basis by assigning a variable whose value has been set in an upstream action.

X Position. The X position of the top-left of the timecode in the output video frame. The range is from 0 to 4096 pixels.

Y Position. The Y position of the top-left of the timecode in the output video frame. The range is from 0 to 2160 pixels.

Font Size. Sets the font size of the timecode. The range is from 6 to 120 pixels.

Text Color. (Default: White). Sets the text color of the timecode. You can enter simple color names, such as red, green, or white. Or enter a color hexadecimal code such as #0000DDFF, which is dark blue. The "FF" characters in this example specify the opacity, and are optional. When these characters are not included the text is completely opaque (no transparency). The pound sign (#) must be included with the hexadecimal code. When a color entry is not valid, the black default is used.

Background Color. (Default: Black). Sets the color of the area behind the timecode. You can enter simple color names, such as red, green, or blue, or enter a color hexadecimal code such as #0000DD, which is dark blue. The pound sign (#) must be included with the hexadecimal code. When a color entry is not valid, the white default is used.

Timecode Transparency. The opacity of the timecode. 1.00 is fully opaque, or 100 per cent opacity, 0 is transparent.

Note: The burned-in Timecode will always represent the actual input timecode being used by the Input Source.

Creating a Tape Capture Workflow

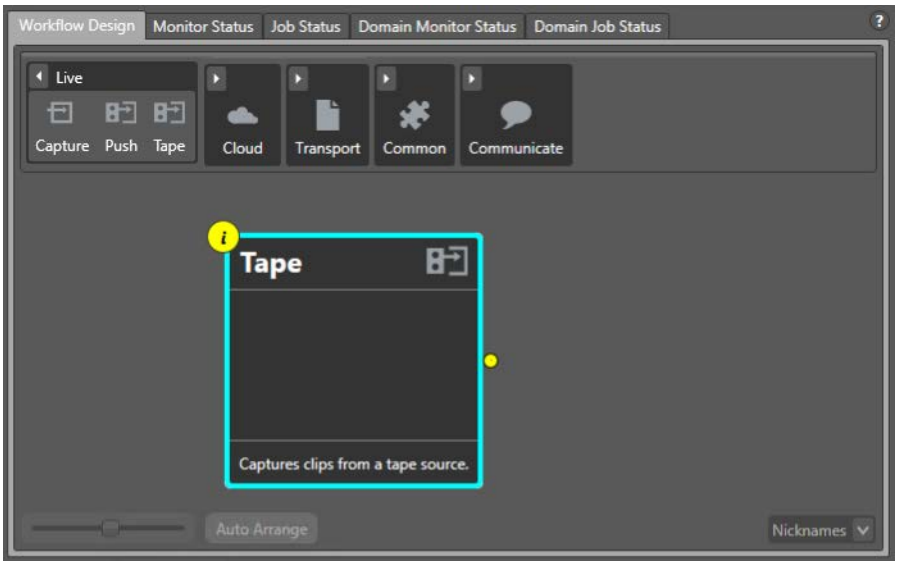
Follow these steps to create and activate a tape capture workflow in Vantage:

Note: Only ONE Tape action is allowed in a Tape Capture workflow. Workflow Designer displays the error "A workflow may contain only one Tape action" when you attempt to add the second Tape action to it.

---

1. Open Vantage Workflow Designer.
2. Select File > Create New Workflow to start a new workflow.
3. Drag a Tape action from the Live group to the design area. A tape capture workflow may consist of this one action. However, you can add other actions to perform

additional functions. See Live Capture Administration Guide > Vantage Actions | Containers | Codecs.

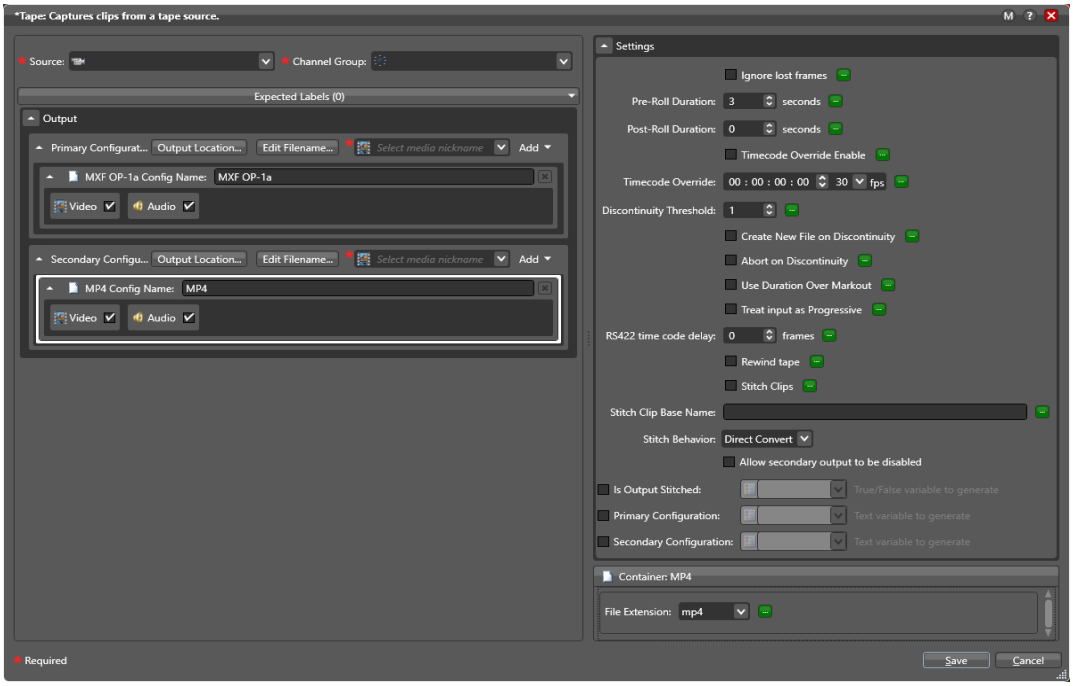


4. Open the Tape action inspector and configure these controls:

   Source—Select the source to utilize.

   Channel Group—Select a channel group (Nexus).

   Expected Labels—Select labels you created, if any, to contain metadata. When selected, they are available to configure in the Tape Capture web application.



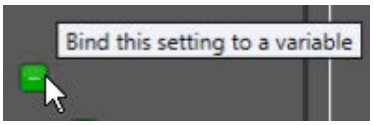
5. Configure the *Configuring Primary and Secondary Outputs* and the *Settings Panel* to meet your requirements. For configuration details, see *Tape Action Overview and Configuration*.
6. Click Save when you finish configuring the Tape action.
7. Click Activate to start the workflow. This workflow must be running to connect the Tape Capture Web app to the VTRs.

Binding Variables to Configuration Controls

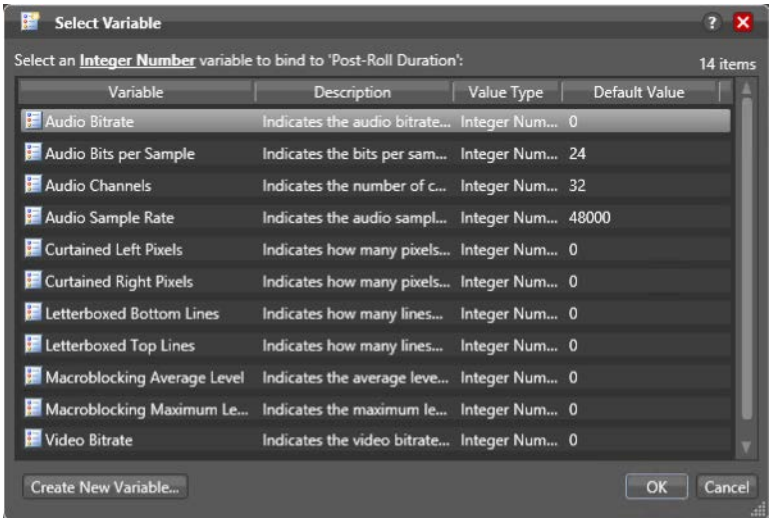
Binding variables to an action's configuration settings enables you to configure those settings directly from the Tape Capture | Live Capture | Live Schedule Pro web application and provide run-time values for each job you submit, rather than hard-coded, static values that never change from job to job.

Note: For detailed topics on creating and using Vantage variables, click the ? icon to display the Vantage Users Guide.

To bind a variable to a control where supported, click the green Variable browse button next to the control:



The Select Variable dialog displays:



You can update each variable that is bound to a control is displayed in the...

- Live Capture web app Customize Parameters dialog. See *Channel Options*.
- Tape Capture web app Customize Parameters dialog. See *Configuring Tape Parameters that are Bound to Variables*.

- Live Schedule Pro web app Variables dialog. See Using Variables in Events in the Live Schedule Pro User Guide.

Using Paths for Vantage Storage

Vantage *stores* are named locations for temporary files. They are used in Vantage to conveniently store and access working media and attachment files, and to write media and other output files. Many Vantage services require access to files; Windows clients such as Workflow Portal also read and write files. These programs (both Windows programs and services) may run on one computer. Usually, however, they are distributed on many computers in an array. In an array, file access must be managed to ensure that the all programs can function correctly.

You can specify Vantage stores on a Windows computer using the following forms:

- UNC paths (shares): *ComputerName**Sharename*
- Drive-letters: *C:**folder**folder*

If Vantage is installed on a single server—the Vantage database, Vantage services, clients, Vantage stores and folders (an All-in-one domain), you can use either form. However, Telestream recommends that you always use the UNC path form to reduce file access problems. It is a requirement when you are operating in an array.

Drive-letter paths are defined in the context of a local computer; it does not identify the computer that hosts the drive. This prevents them from being useful in arrays. For example, if you specify a Vantage store on drive C using a drive letter, and a Workflow Portal operator on a different computer tries to view files in that store, Workflow Portal searches for files on drive C on the operator's computer, not the Vantage server.

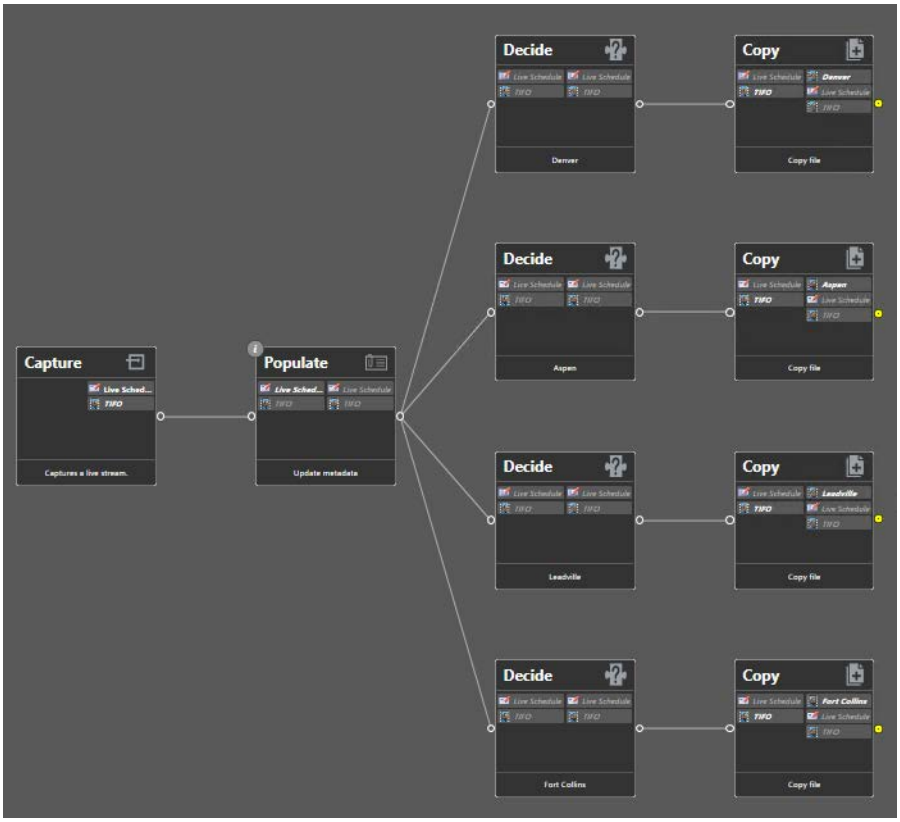
In another example, you create a workflow in Workflow Designer installed on Computer A. It has a Watch action, which is executed by a Vantage Monitor Service running on Computer B. You specify a hot folder on drive C on Computer A, where Workflow Designer is installed. When the service executes the Watch action, it attempts to locate the hot folder on Computer B's C drive, which does not exist.

When any Vantage service or client program needs to access and use Vantage storage or a directory on a different computer, you must specify the path using the UNC form. When services or clients access Vantage storage from another computer, the Vantage storage location or directory must be configured as a share, and access must be granted to the appropriate Windows users. For more information, see Windows Authentication Guidelines in the *Vantage Domain Management Guide*.

When you plan to use a SAN system, be aware that some SAN systems expose the shared drive as a letter (mapped) drive—for example, X:—that is visible in any SAN. You can utilize SAN drives via a letter drive reference, provided that each Vantage server is a SAN client and that all mount points use the same letter.

Prototype Capture Workflow—Labels & Variables

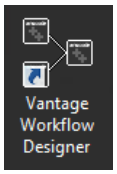
The purpose of this prototype workflow is to illustrate the use of variables, extracted from an incoming metadata label submitted with the Capture event, which captures video from cameras in four different cities.



The Capture action is configured to ingest the label when it starts a job. The Populate action extracts the label's field value and updates a variable, which is then examined in parallel Decide actions to identify the name of a city, and store the captured output in the proper city's directory.

Creating and Configuring the Media Creation Capture Workflow

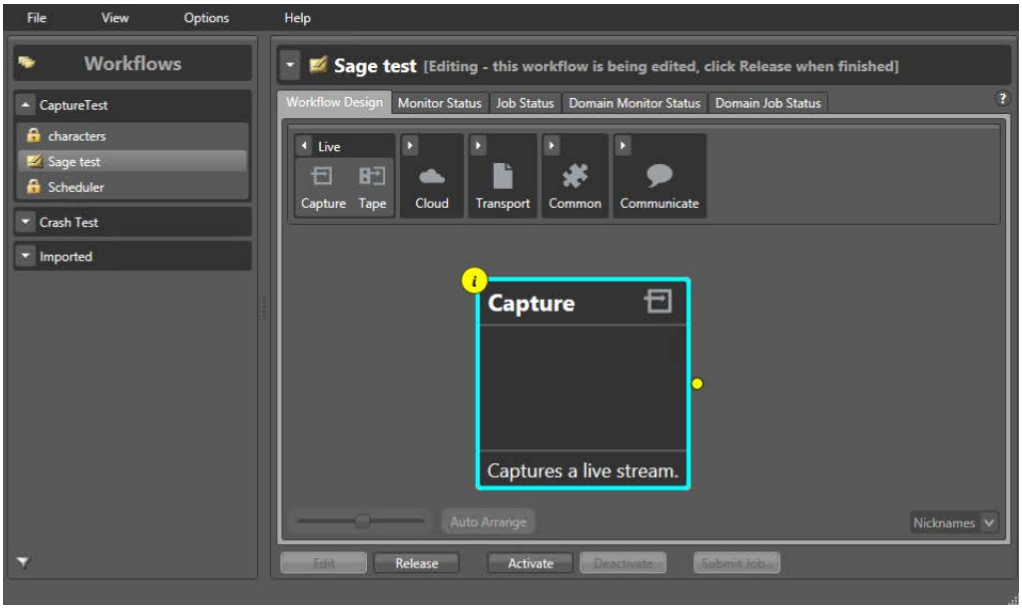
Follow these steps to create and activate the first workflow—using the Media Creation action:



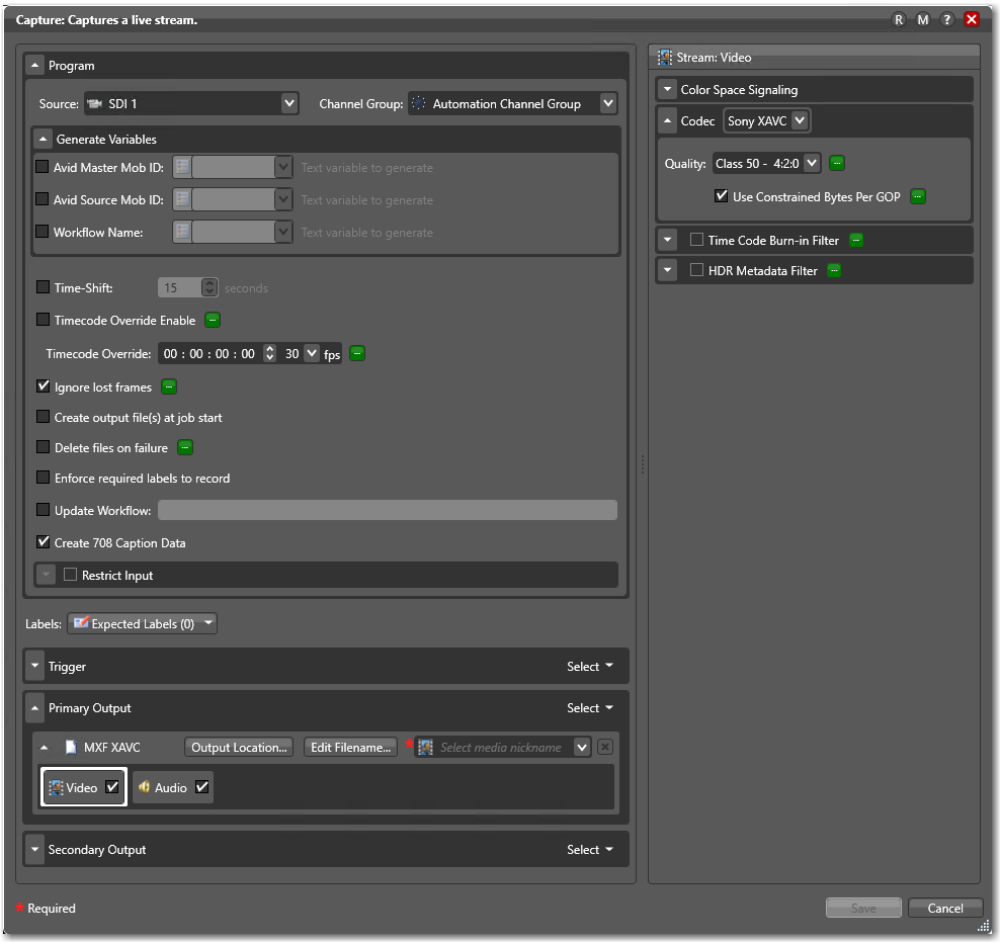
1. Launch Vantage Workflow Designer.
2. Select File > Create New Workflow and name the workflow—Media Creation Capture, for example

Note: To avoid workflow failures, do not use these characters in workflow names:
` * | \ : ; " ' < > ? /

3. In the Workflow Design panel, open the Live action category and add a Capture action to the workflow design workspace below:

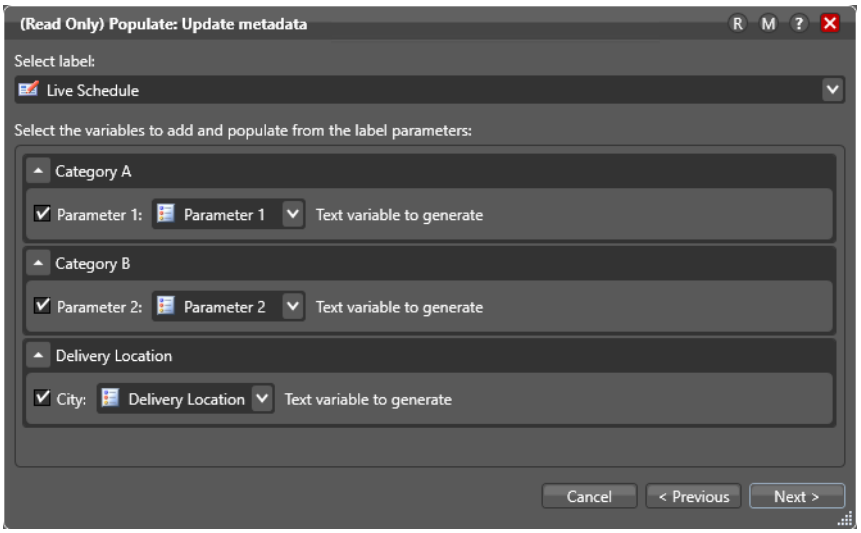


4. Click the Inspector icon on the upper left corner of the action (or double-click the action) to open the Inspector.



5. Configure the action according to your requirements. For configuration details, see *Capture Action Overview and Configuration*.
6. Click Save when you finish configuring the action.
7. Click Activate to start the workflow so that it is ready to start jobs when directed to do so by the Live Capture web app.

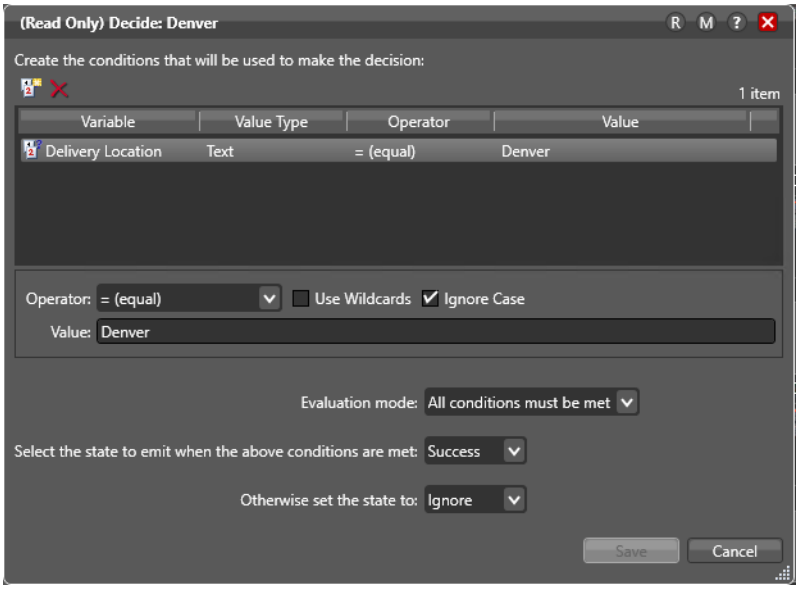
Populate Action—The Populate action updates specified variables from the specified fields in the incoming Live Schedule label, as shown:



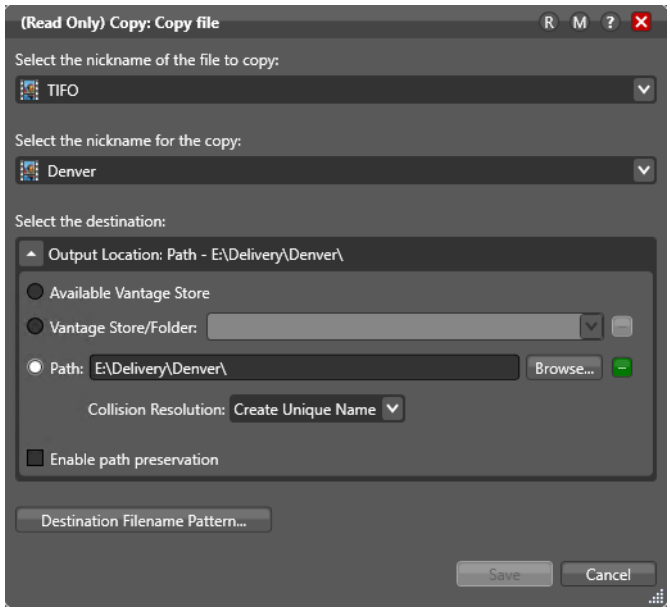
The Delivery Location's City field is what is of interest in this example. The Delivery Location variable is updated with the value in the City field.

Refer back now, to the workflow itself. There are four Decide and Copy action sets.

Decide and Copy Action Sets—Each Decide passes control to downstream actions in its branch only when a specific city is present in the Delivery Location variable. Here is a Decide action, where it succeeds if the variable is equal to the string "`Denver`":



The result is true, thus it executes successfully, permitting the corresponding Copy to duplicate the file, as shown here:



In this example, the TIFO file generated by the Capture action is nicknamed *Denver*, and the file is copied to `E:\Delivery\Denver`.

Summary

You can design and configure your live capture and tape capture workflows to process both variables and labels, and use the values that are unique to each capture job to intelligently process your captured media, as shown here delivering the captured output into a unique directory for each city where the video was shot.

Managing Video Sources

You use the Source Manager web app to create, configure, and manage your Live Capture server's various supported video source inputs—both SDI and IP-based video. Before you can connect a specific Vantage Live Capture workflow to a source for recording, it must be configured in Source Manager.

Note: If you add a new network interface to a Live Capture server, you must stop and restart the Telestream Live Source service for a Transport Stream source to recognize it.

You can control access to Source Manager by creating and managing users and authorities in the Group Portal web app (see *User Administration*).

Topics

- Overview
- User Administration
- Configuring Capture for SD/HD | UHD SDI Sources
- Enabling QuadLink Loop Through
- Configuring SDI Sources
- Creating & Configuring Transport Stream Sources
- Creating & Configuring RTMP Sources
- Creating & Configuring SRT Sources
- Creating & Configuring NDI Sources
- Creating and Configuring ST 2110 Sources
- Managing System Settings
- Version Info | Help | Documents | Contact Methods
- Troubleshooting

Overview

Source Manager enables you to create, configure, and manage each Live Capture server's video sources.

Sources do not automatically display in Live Capture when they are created here in Source Manager. In Live Capture, you create channels, which are connections between an active Vantage Capture workflow and a source. Once you create a channel, its source displays on the channel card and in the preview window, when the channel is selected.

Launch Source Manager using *http://localhost:8090/* | *http://*`<Remote host name>`*:8090/*. The default credentials are *admin/live!*. For more information on launching and logging in to Source Manager, see *Launching the Source Manager Web App*. For other web app topics, see *Managing your Web Apps*.

Note: Unlike other Capture web apps, Source Manager only operates on its host platform's inputs. Thus, if you have a Capture array, you must log onto Source Manager on each Live Capture server to manage that server's source inputs.

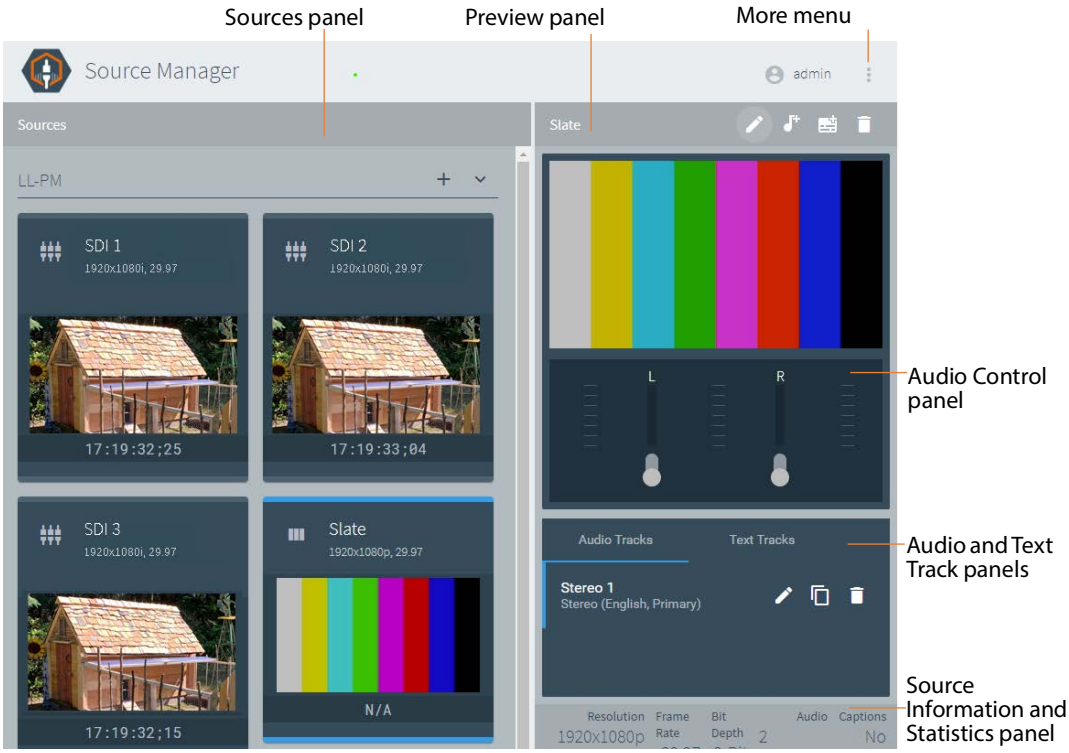
Topics

- Using the Source Manager Window
- Sources Panel
- Preview Panel
- Audio and Text Tracks Panel
- Source Information and Statistics Panel

Using the Source Manager Window

The Source Manager web app provides you an overview of all SDI sources on the Lightspeed Live Server, and other sources you've added, Source Manager displays thumbnails, a preview of the selected source plus an audio and source information/ status panel.

In the case of a Capture array—multiple servers—the sources for each server are displayed in a separate panel.



The Source Manager window displays several panels:

- The left panel—the Sources panel—displays inputs, referred to as *sources;* the permanent SDI sources, plus sources of other types that you've created (RTMP, Transport Stream, etc.).
- On the top right is the Preview panel for the selected source.
- Below the Preview panel is the Audio Control panel.
- Below the Audio Control panel is the tabbed audio and text track panel.
- At the bottom right is the Source Information and Statistics panel.

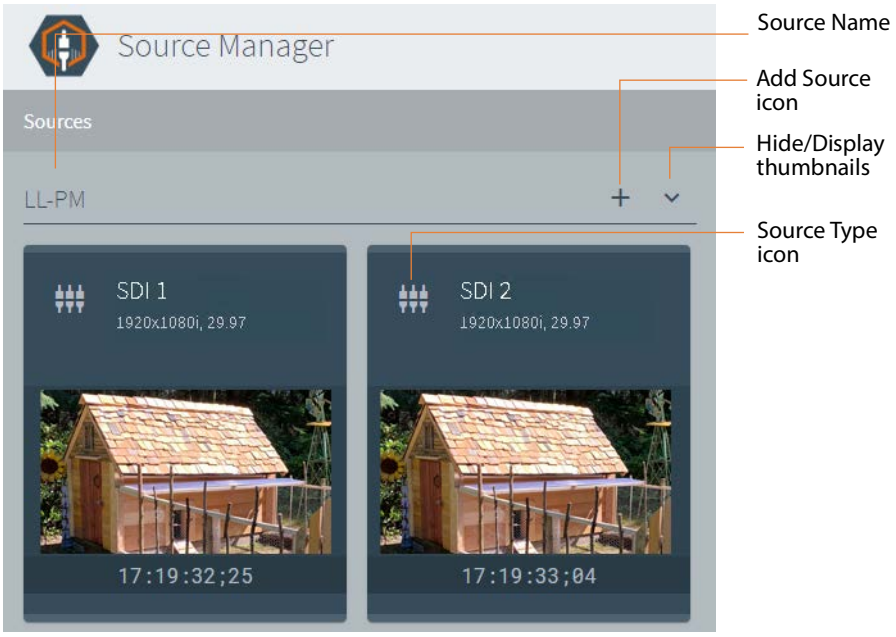
Other modal panels display as you use Source Manager to add and configure sources, and perform other utilitarian tasks.

Sources Panel

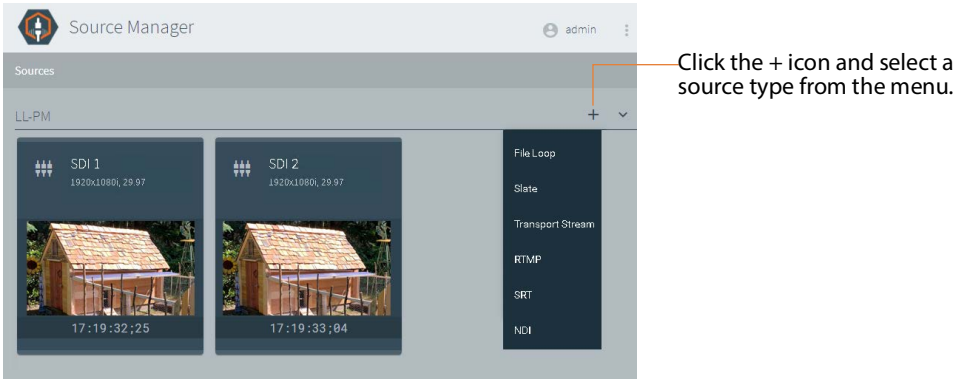
Each source in the Sources panel displays a thumbnail (which updates every few seconds) of the current input (or the LOS video test pattern if no input is present), plus important details: frame size and rate, timecode, etc.

Toolbar

The toolbar includes icons for adding sources, and displaying or hiding the thumbnails.



To add a new source, click the + icon and select a source type from the Source menu.



Note: ST 2110 (both text and HTML files are supported) is available on Lightspeed Live servers equipped with the ST 2110 + NMOS option.

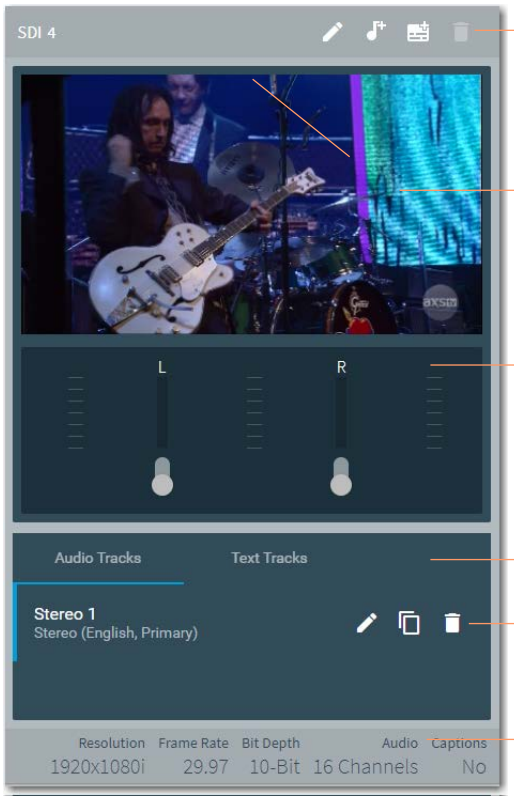
Source Type Icons

Each source's thumbnail displays an icon in the upper left corner of the source's thumbnail, depicting the source type. The thumbnail displays a LOS banner when there is loss of signal.

	Permanent SDI source
	Transport Stream source
	RTMP source
	ST 2110 source servers equipped with 2110/NMOS option
	NDI source
	SRT source
	Source is currently being captured and can't be edited or deleted.
	This source has experienced LOS (loss of signal).

Preview Panel

Select a source thumbnail to play the stream in the preview panel to the right, along with tracks and metrics, below:



The preview panel is comprised of a proxy preview of the current stream, with an audio/text tabbed panel below.

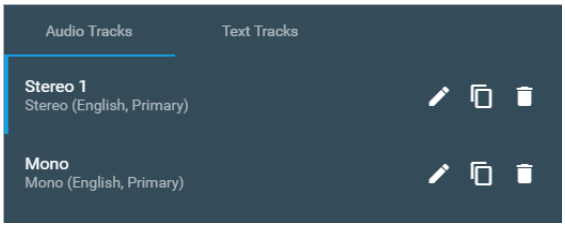
Note: The Text Tracks tab is not used in Live Capture. Editing, duplicating, and deleting tracks has no effect on the stream being captured in Capture workflows.

Viewing Audio Levels and Muting Audio

You can use the controls in the audio meter to enable | disable audio playback through your workstation speakers. The audio level meters for each channel display and adjust automatically, based on the selected track (Stereo, 5.1 Surround Sound, etc.), with channel-by-channel mute control.

Audio and Text Tracks Panel

If there are multiple audio tracks in the stream, you can switch among them using the Audio Tracks tab.

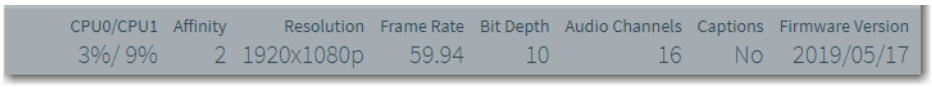


Note: The Audio tracks tab enables you to select a track to play. Otherwise, it performs no useful function, with the exception of identifying AC3 audio (*Tagging AC3 Audio Embedded in PCM*). Editing, duplicating, and deleting audio tracks has no effect on the stream being captured in Capture workflows.

Text tracks are not used in Live Capture.

Source Information and Statistics Panel

The Source Information and Statistics panel (at the bottom-right corner of the main window) displays real time platform performance metrics and metrics for the currently selected source:



CPU0/CPU1—Percentage of CPU utilization by processor—CPU 0 and CPU 1. If system utilization of one or the other processor. If an IP source's CPU0 or CPU1 utilization exceeds 75 percent, consider changing the Preferred Processor of one of the sources to use the other processor so the recordings can balance. (You can't change the control during capture.) If utilization approaches 100 percent, it may lead to capture failure.

Affinity—The processor group currently processing this source. For details, see Live Capture Administration Guide > Balancing CPU Processor Group Affinities.

Resolution | Frame Rate | Bit Depth | Audio Channels | Captions—Video metrics.

Firmware Version—The firmware version in this server's SDI card.

User Administration

You use the Group Portal web app to control access to the Source Manager web app. In the Group Portal, you can create users and assign roles for restricting utilization of the Source Manager web app. For example, you can assign roles for administrators, operators, schedulers, monitors, and API users.

Note: Group Portal uses the term *Group* to refer to a set of Live Capture users. You create a group and then you add users—however, these users are only valid for the target Lightspeed Live Server.

Topics

- Launching the Group Portal Web App
- Creating a Group
- Signing In
- Creating/Updating Live Capture Users

Launching the Group Portal Web App

Here's how to launch the Group Portal web application:

Note: Only Chrome web browser, version 76.0.3809.100 or later, is supported for use of Lightspeed Live web applications.

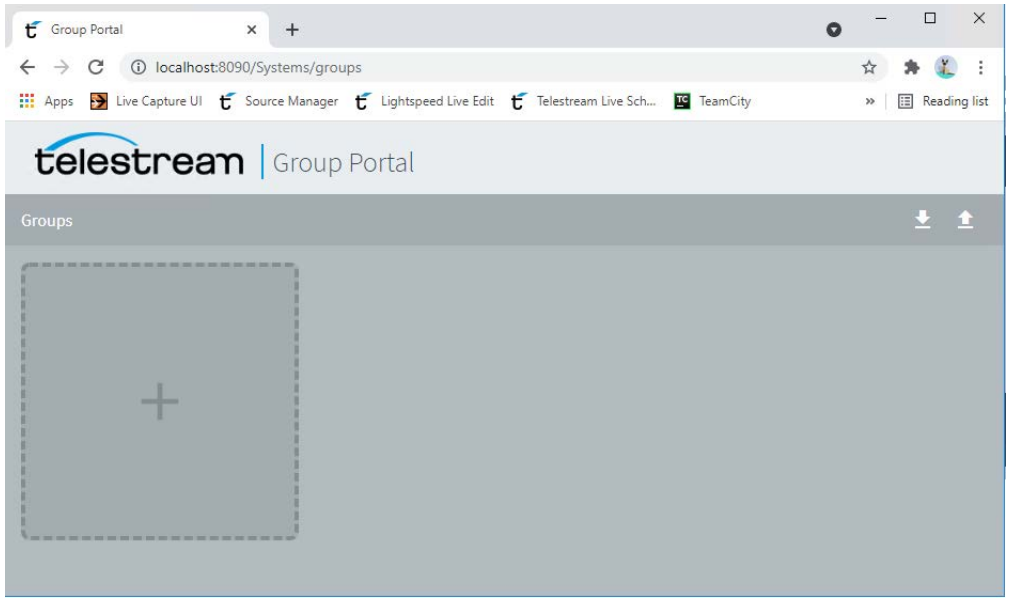
On the target Live Capture server, verify that the Telestream Live Source Service is running.

Launch Chrome and enter the following URL in the address field (If you changed the default port, be sure to use it):

http://localhost | `<host name>` *:8090/Systems*

When running Chrome locally on the target Live Capture server, use *localhost* as the host name in the URL.

The Group Portal web app launches and displays the Group Portal window:

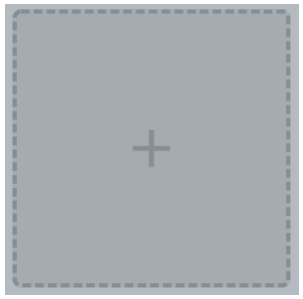


This window represents the first launch, without a group having been created. If you already have created a group, proceed to *Signing In*, following.

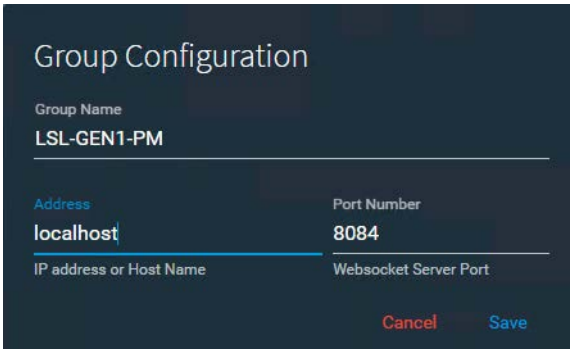
Creating a Group

This is a one-time task. To create a group, follow these steps:

1. Click the gray box with the plus sign:



2. The Group Portal web app displays the Group Portal panel:



3. Name the group and specify the host:

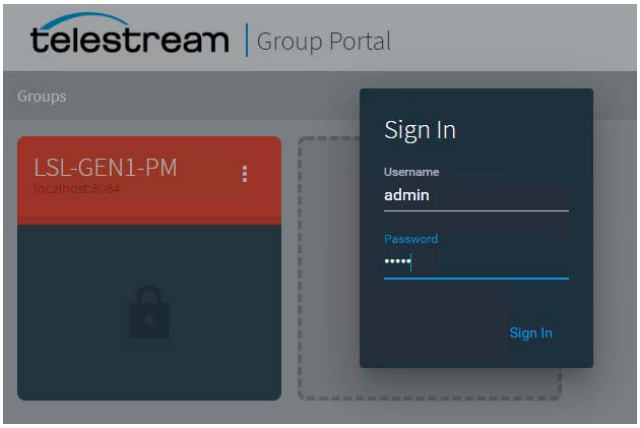
- **Group Name**—Specifies the name of the group. Typically, name the group the same name as the server.
- **Address**—Specifies the host name | *localhost* of the target Live Capture server.
- **Port Number**—Specifies the web socket server port (default: 8084).

  Group Portal displays the Sign in panel.

Signing In

Use the Sign In panel to authorize your user.

Note: Only users with an administrator role can log in to the Group Portal.

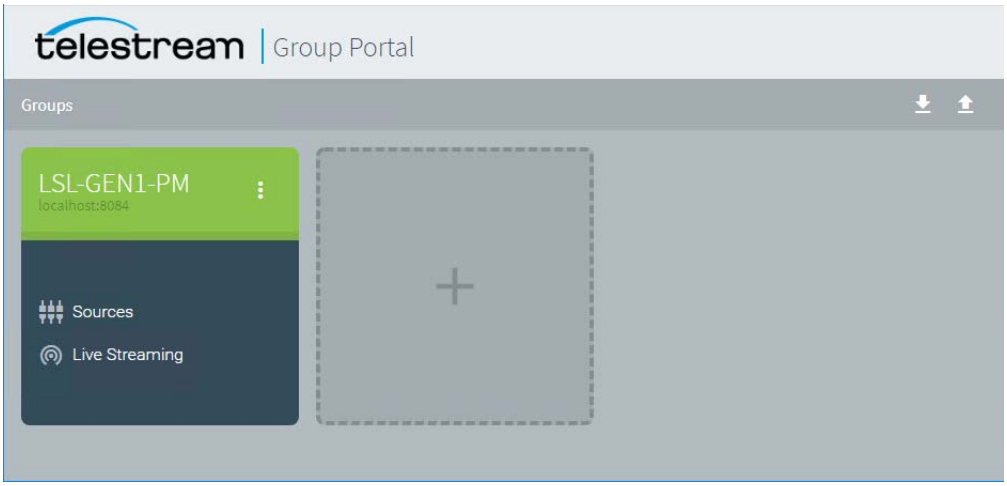


If you've clicked away, display the Sign In panel again by selecting it in the More menu on the Not Authenticated panel.

Enter your credentials. The default credentials are: *admin* / *live!*. If this is the first time, use the default credentials. If other admin users have been created, you can log in with those credentials.

If you have trouble starting the Group Portal web app, review the common problems in *Troubleshooting*.

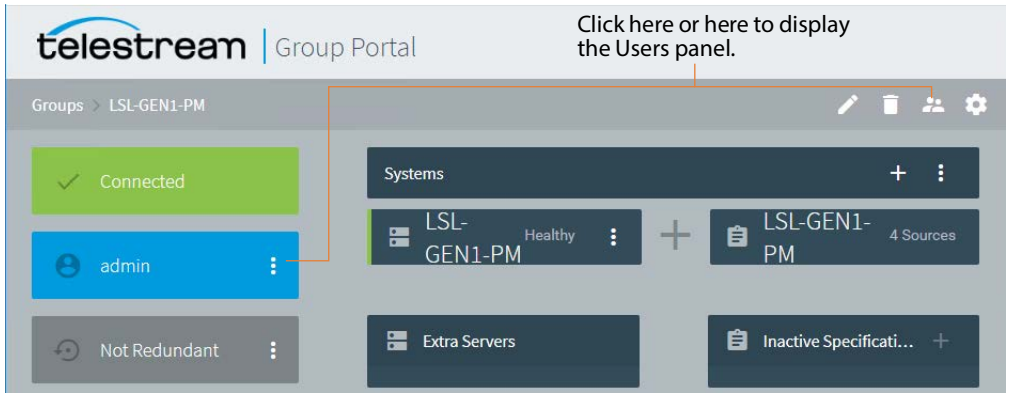
When you have logged in successfully, the group panels display:



The green title bar on the group indicates a successful connection. Now, you can manage users in that group.

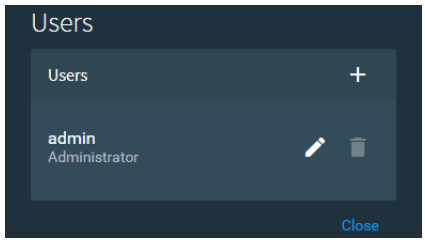
Creating/Updating Live Capture Users

To create or update users, click on the group to display the Group Details panel:

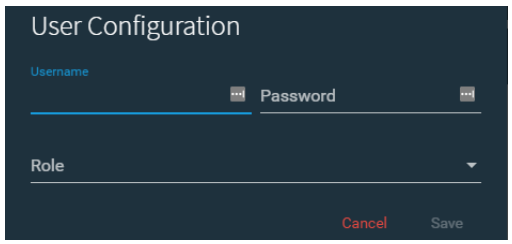


Select the Users menu in the upper right corner or click the More menu in the Admin panel and select Manage Users.

To add a new user, click Add (+). To edit an existing user, click the user's pencil icon. To delete a user, click the trash icon.



When adding a user, assign a user name and password, select a role, and click Save.



Available roles and their privileges include:

- **Administrator**—Enables users to manage users in Group Portal, and view | create | modify sources in the Source Manager web app
- **Operator**—Enables users to view | create | modify sources in the Source Manager web app
- **Scheduler | Monitor**—Enables users to view sources in the Source Manager web app but prevents them from changing settings.

Configuring Capture for SD/HD | UHD SDI Sources

You can configure a Lightspeed Live Server to process a stream of SD|HD video on each SDI port. Or, you can configure them to combine (in software) four HD SDI signals into a single UHD video stream, using a technique known as *quadlinking*.

Note: Quadlinking isn't supported on Lightspeed Live Servers with 12G SDI.

On Lightspeed Live SDI servers, you can mix and match SD/HD and UHD. You can configure four-port sets for UHD signals, or set some for UHD and the others for SD/HD.

Use these procedures to configure a set of four SDI ports to quadlink UHD or in reverse, return to using SD/HD SDI on those ports. The process involves switching cables from your video source devices, re-configuring your sources via the Source Manager web app, and creating appropriate workflows and connecting them to the appropriate sources in Vantage Workflow Designer.

Note: The Vantage Live Service does not differentiate between UHD and SD/HD in SDI sources. If the server is connected to a UHD signal but *SingleLink Video* | *SingleLink Loop Thru Video* Input is specified, the four signals of the source are processed as four separate sources. To quadlink the SDI sources to create a UHD signal, you must enable QuadLink Video Input | QuadLink Loop Thru Video Input for servers equipped with 3G SDI.

Configuring Live Capture for UHD Video

Note: C5 servers have 8 permanent input and 8 permanent output SDI ports; loop-through is permanently enabled and can't be changed. Ignore loop through steps when performing this task on these servers.

When the 3G SDI ports video mode are set for SD/HD (SingleLink Video mode and you want to re-configure them to quadlink four SDI inputs into one UHD video stream, follow these steps:

1. Connect a valid UHD source (4 BNC cables) to the server's SDI ports (1 through 4 or 5 though 8, model dependent).
2. On 8-port or 16-port (V series) servers, if you are planning to enable video loop through, make sure to connect cables properly for QuadLink Loop Through Video Input (see *Enabling QuadLink Loop Through*).
3. Start the 4-port UHD source to provide signal to the Lightspeed Live Server.
4. In Vantage Workflow Designer, deactivate all Live Capture workflows using SDI sources.

5. Launch Source Manager (*Launching the Source Manager Web App*). In the Sources panel (see *Configuring SDI Sources*), select your SDI port based on your Lightspeed Live server:
   - 4-port server—select *SDI 1*
   - 8-port server—select *SDI 1* or *SDI 5* (this server supports two UHD streams)
   - 8-port server for loop through—select *SDI 1* or *SDI 5*, but not both.
   - Dual 8-port with loop through—select *SDI 0:1 to 0:5* or *SDI 1:1 to 1:5*.
   - Dual 8 port without loop through—select *SDI 0:1 to 0:5* or *SDI 1:1 to 1:8*
6. Click the Edit icon to display the Configure Sources panel.
7. Disable Preferred Processor (if displayed in the panel—model dependent (see *Managing System Settings*)).
8. Set Video Mode to *QuadLink Video Input* or, for a dual 8-port system, select *QuadLink Loop Thru Video Input*.
9. Click Save and close the panel. The four SDI source set (1-2-3-4 or 5-6-7-8) is now QuadLinked into one UHD source.

   When you QuadLink SDI 1, then SDI 2, 3, and 4 are removed from the Sources panel and SDI 1 is renamed to *QuadLink 1*. Similarly, when you QuadLink SDI 5—SDI 6, 7, and 8 are removed from the Sources panel and SDI 5 is renamed *QuadLink 2*.
10. Optionally, on 8-port servers, you can implement video loop through—set the video mode to QuadLink Loop Thru Video Input and perform the steps in *Enabling QuadLink Loop Through* now.
11. In Vantage Workflow Designer, create (or update) a Live Capture workflow per your UHD video processing requirements and configure the Capture action to connect to the newly-named SDI input that created for this workflow. See *Creating Live Capture Workflows*.
12. Activate the workflow so that it is ready to start a job when it receives a stream.

Configuring Capture to Process SD/HD Video

Note: C5 servers have 8 permanent input and 8 permanent output SDI ports; loop-through is permanently enabled and can't be changed. Ignore loop through steps when performing this task on these servers.

When your Live server is currently set to UHD/4K mode and you want to re-configure it to process SD/HD video, follow these steps:

1. Make sure that a valid UHD/4K source is actively providing a signal to the server's SDI ports you are using for UHD and plan to convert back to SD/HD use.
2. In Vantage Workflow Designer, deactivate all Live Capture workflows that were using the UHD/4K source.
3. In Source Manager, display the Sources panel (see *Configuring SDI Sources*), select the UHD/4K source (SDI 1 or SDI 5—or SDI 0:1 or SDI 0:5 on C5) you want to convert and then click the Edit icon to display the Configure Sources panel.

4. Set Video Mode to SingleLink Video Input | SingleLink Video Loop Thru Input, then click Save to update the configuration and close the panel. The SDI source is converted to SD/HD and the other three SDI sources are displayed again.

Note: On C5 servers, loop through is permanently set and can't be changed.

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5. If you enabled SingleLink Loop Through Video, perform the steps in *Enabling QuadLink Loop Through* now, and return to continue.
6. Turn off the device generating UHD/4K video and disconnect the SDI cables from the UHD/4K device.
7. Connect the SDI cables to your SD/HD device(s) as planned—making sure to connect cables properly for SingleLink Loop Through Video Input if enabled.

   In the Source Manager panel, and select each of the four SD/HD sources and configure them as appropriate. See *Configuring SDI Sources*.
8. In Vantage Workflow Designer, create (or update) the SD/HD workflow per your processing requirements and configure its Capture action to connect to the newly-named SDI source for this workflow. See *Creating Live Capture Workflows*.
9. Click Activate to start the workflow so that it is ready to start a job when it receives a stream.

Enabling QuadLink Loop Through

QuadLink Loop Through Video Input is available only on servers equipped with 8- or 16-port 3G SDI cards.

Note: C5 Lightspeed Live servers have 8 permanent input and 8 permanent output SDI ports; loop-through is permanently enabled and can't be changed.

Configuring an SDI source with QuadLink Loop Through causes the server to route the SDI source back out—or *loop through*—a paired SDI port, in addition to using the signal as a source. You can use this, for example, for confidence monitoring of the SDI signal into the server. You can enable QuadLink Loop Through on SDI 1 or SDI 5.

⚠ ***Important Note:*** SDI-1 input is used as the master sync when QuadLink Loop Through Video Input is enabled. All source inputs MUST be of the same baseband video type (frame rate and frame size) and they MUST share a common video reference that is frame synced and gen-locked together. Failure to meet this requirement results in a vertical offset being introduced in the sources.

If the source video type (such as frame rate or frame size) changes on SDI1 when operating in QuadLink Loop Through mode, the other inputs fail and go to LOS (loss of signal). After SDI1/5 is set back to match the other inputs, changing a setting on a source and saving it resets the source back into operation.

When you enable QuadLink Loop Through for a given SDI source, the paired SDI source for the output is automatically deleted without warning—because it is now an output on the paired SDI port. For example, you set *[host] - SDI 1* to loop through to *SDI 5*; Source Manager deletes the source instance of *[host] - SDI 5*. The previous source is unavailable to any Capture action or stream channel that was set to use that source.

SDI-1 automatically goes to SDI-5 and SDI-2 goes to SDI-6, etc. The source cards auto-populate. See *Port-Paired Loop Through Assignments* for more information.

Port-Paired Loop Through Assignments

The following pairings apply when configuring SDI input ports for Loop Through:

For Servers with Four 3G SDI Ports

- SD/HD:
  - SDI-1 is paired with SDI-3
  - SDI-2 is paired with SDI-4
- UHD/4K:
  - No Loop Through

For Servers with Eight 3G SDI Ports

- SD/HD:
  - SDI-1 is paired with SDI-5
  - SDI-2 is paired with SDI-6
  - SDI-3 is paired with SDI-7
  - SDI-4 is paired with SDI-8
- UHD/4K:
  - UHD/4K Input 1 QuadLinked with SDI-1+SDI-2+SDI-3+SDI-4
  - UHD/4K Output 5 QuadLinked with SDI-5+SDI-6+SDI-7+SDI-8 for loop-through.

For Servers with 16 3G SDI Ports

- SD/HD:
  - SDI-0:1 is paired with SDI-0:5
  - SDI-0:2 is paired with SDI-0:6
  - SDI-0:3 is paired with SDI-0:7
  - SDI-0:4 is paired with SDI-0:8
  - SDI-1:1: is paired with SDI-1:5
  - SDI-1:2 is paired with SDI-1:6
  - SDI-1:3 is paired with SDI-1:7
  - SDI-1:4 is paired with SDI-1:8
- UHD/4K:
  - UHD/4K Input 1 QuadLinked with SDI0:1+SDI0:2+SD0:3+SDI0:4
  - UHD/4K Output 5 QuadLinked with SDI0:5+SDI0:6+SDI0:7+SDI0:8
  - UHD/4K Output 9 QuadLinked with SDI1:1+SDI1:2+SDI1:3+SDI1:4
  - UHD/4K Output 13 QuadLinked with SDI1:5+SDI1:6+SDI1:7+SDI1:8 for loop-through.

Configuring SDI Sources

All SDI sources are permanent—you can't create or delete them. For each SDI source port on the server (model dependent), an SDI source displays in the Sources panel.

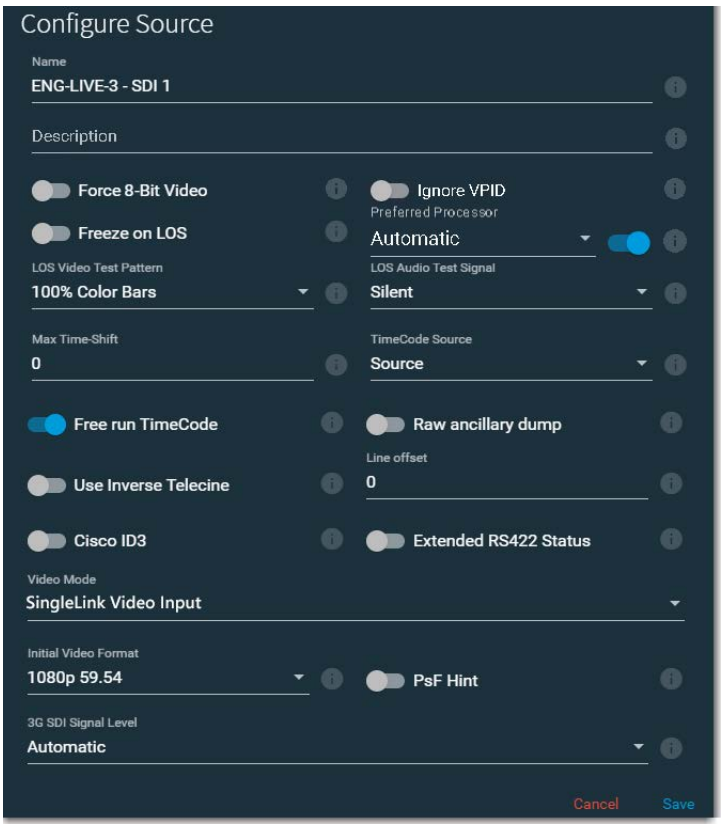
Note: If you have implemented RouteMaster for SDI source control, if you are changing the destination, you should deactivate associated workflows and then restart them. See the Live Schedule Pro User Guide for selecting RouteMaster sources.

In a Live Capture array, you should name each Lightspeed Live Server's SDI ports with a unique name to avoid confusion—for example, add the Lightspeed Live Server name as a prefix: *Lightspeed1-SDI-1*, or on a C5, *Lightspeed1-SDI-0:1*.

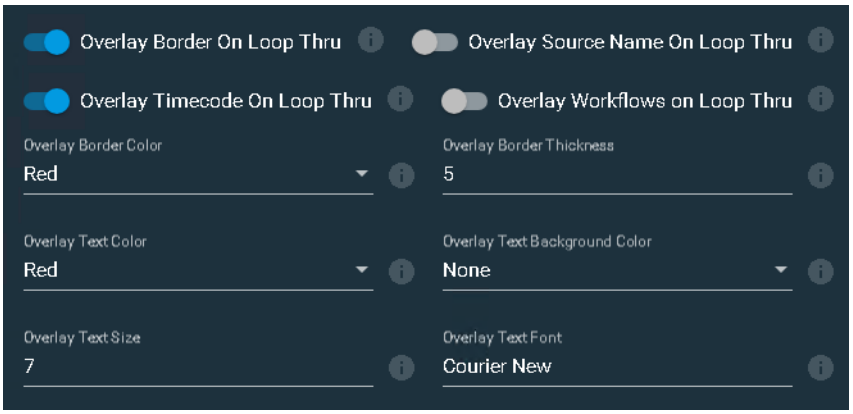
To modify an SDI source configuration, select it in the Sources panel to display its Preview panel.

Note: While an SDI source is being captured, you can only edit the source's name and description.

Click the Edit icon to display its Configure Source dialog:



When Loop Thru is specified for Video Mode, the Configure Source dialog displays additional controls:



Make changes to the controls as required and click Save to close the panel and update the source.

Name—Specifies the name to use in Capture web apps and the Vantage Capture action. You can't change the name while the source is being captured.

When you name a source, observe these rules:

- Each source instance must be named uniquely.
- These characters are prohibited: ` * | \ : ; " ' < > ? /
- After changing a source name you must re-configure affected Capture actions in Vantage workflows that utilize the renamed source. See *Capture Action Overview and Configuration*.

The default name for SDI ports on a single-card server has the form: *SDI [1 through n]*, where '*n*' is 4 or 8 depending on the SDI card in the Lightspeed Live Server.

When hosted on a dual, 8 port-card (*Live Capture Administration Guide > 16-Port (dual 8 port) 3G SDI Cards with Reference and LTC*) Lightspeed Live server, the default name has the form: *SDI [0 | 1]:[1 through n]*, where the card number is 0 or 1, and the connector number is 1 through n, where '*n*' is 4 or 8 depending on the depending on the SDI card in the Lightspeed Live Server.

When you rename a source, observe these rules:

- Each source instance must be named uniquely.
- These characters are prohibited: ` * | \ : ; " ' < > ? /
- After changing a source name you must re-configure affected Capture actions in Vantage workflows that utilize the renamed source. See *Capture Action Overview and Configuration*.

Description—Practical description of the source or when using RouteMaster with Live Schedule Pro, the router port.

For a router source controlled by RouteMaster, you specify the SDI source—which is the router output—by providing the keyword *destination* and the router's port number,

separated by a colon. For example: `destination:152`. This specifies that there is an SDI cable from router port 152 to the SDI port you're configuring, which does not change.

Force 8-Bit Video—8-bit video should only be used with 8-bit codecs such as XDCAM. When enabled, activates 8-bit down-sampling of the SDI video. Using 8-bit sampling offers more efficient compression. Disable to utilize 10-bit video, which should be used for all 10-bit codecs such as ProRes.

Ignore VPID—An SDI source displays Loss of Signal when the embedded VPID data is not valid for the source. In normal use, VPID data should match the SDI source and it is expected that a new source process is created when the source changes; for example, when the frame size or frame rate changes.

If the VPID does not match the source frame rate and frame size after an upstream source is switched, you can enable Ignore VPID to ignore the VPID data to avoid loss of signal during recording.

Freeze on LOS—When enabled, causes the source to hold the last good frame if the signal is lost. When disabled, LOS causes the LOS Video Test Pattern to be displayed. For details, see *Loss of Signal Behavior*.

Preferred Processor

Note: If this control doesn't display, processor balancing on this model server is performed automatically, and no end-user adjustment is available.

When enabled (C2+ and earlier), processing associated with each Capture job is assigned to the assigned CPU on the server's multi-core CPU to prevent inefficient process mapping across CPU sockets during heavy loads, typically when several sources are capturing concurrently.

On C4 and later models, for IP sources you can manually set affinity to a specific socket. If you create IP sources in order and use them in order, balancing is automatic. However, for example, if you delete every other IP source, the remaining sources do not balance and you can use can use this control to balance them. If IP sources are maintained long term, it may be helpful to assign each source a preferred processor.

Disabling this option during multi-source capturing may result in excessive CPU usage. When Preferred Processor is disabled, affinity is set to 0 (see Live Capture Administration Guide > Balancing CPU Processor Group Affinities).

LOS Video Test Pattern—Applies only when Freeze on LOS is disabled. Specifies the test pattern to display during LOS. For details, see *Loss of Signal Behavior*.

LOS Audio Test Signal—Specifies the audio signal to use during LOS.

Max Time-Shift—Specifies the maximum duration of video that the time-shift frame buffer can hold, which is used to delay the source for workflows using this source. Specifies the duration in seconds (maximum: 10). Some limitations may exist for higher bit rates and frame rates.

Note: Live Capture's Time-Shift holds incoming source media frames in an internal FIFO buffer. See Live Capture Administration Guide > Determining the Time-Shift Buffer Duration for suggested settings for various frame sizes and rates.

When a capture workflow is activated with Time-Shift enabled, the source media is stored in the buffer, which allows Live Capture to reach back in time and access media processed in the past, based on the value of the Time-Shift field. Since Live Capture's Time-Shift is always processing a source's media, when you start recording, any media stored in the buffer is available to be added to the capture file.

Timecode Source—Click the menu to choose one of the following timecode source signals for the selected SDI input:

- *Source*—Uses the timecode provided in VBI or VANC (SMPTE 12M-2/RP188) of the selected Live Capture's video input signal. If a valid timecode is not available or goes away, see the Free Run Timecode option below.
- *Computer Clock*—Uses the time-of-day clock provided by the Live Capture server. When selected, also configure Compensate for Computer Clock Drift.

WARNING: If video and timecode are not synchronized to the same reference, time code discontinuities can occur. To avoid time code anomalies such as unexpected discontinuities and repeated time codes, always sync the incoming SDI signal and timecode to the same genlock (reference) source. Failure to do so can cause recording that stop abruptly or do not stop as expected.

Caution: If your Live Capture server's Time Zone Setting is set to a time zone that does not have Daylight Savings Time, computer clock use UTC time, due to a Windows limitation.

- *None*—Specifies zero-based timecode recording. When recording begins, the timecode is set to 00:00:00:00. If Free Run Timecode is enabled, then the timecode inserted into a QuickTime or MXF file auto-increments. Otherwise, every frame in the output file contains timecode 00:00:00:00. Capture displays N/A on the workflow thumbnail, indicating that there is no applicable timecode available, and 00:00:00:00 displays in Capture's Preview timecode window.
- *Analog LTC*—Uses the timecode provided on the SDI card's LTC input (marked with an R on the SDI card). If a valid timecode is not available or goes away, see the Free Run Timecode option below.

Note: Analog LTC timecode is passed to Live Capture in input frame samples from the SDI card. When a channel is in an LOS state, the LTC timecode is not present and is passed to Live Capture at 00:00:00:00 until a valid signal is present on the input.

- *RS422*—Uses the timecode provided by a VTR connected via RS422 (requires the optional 4-port or 8-port RS422 VTR Interface Kit—see Live Capture

Administration Guide > Connecting VTR Systems). If an input is connected to a VTR under RS422 control, RS422 must be selected.

Note: When using the CalDAV Calendar trigger you should set the Timecode Source to either Computer Clock or Source. When using Source, you must have time-of-day timecode in your source that matches the time set in your Lightspeed Live Server. See *Configuring Trigger Settings*.

Free Run Timecode—When enabled, and the timecode is not detected or goes away, the timecode seamlessly free-runs from the last good timecode received. When not enabled and the timecode is not detected or goes away, then the timecode reverts to zero (00:00:00:00) and stays at zero.

Raw Ancillary Dump—When enabled and the output container is set to TIFO, the SDI input's ancillary data is inserted directly into the Primary Output file.

Caution: Do not enable this option unless directed by Telestream Support

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Use Inverse Telecine—Does not apply in Capture, because no frame-rate conversion is applied. Do not enable this control.

Line Offset—When enabled, shifts the video by the specified line offset. Default is 0. Minimum is -4, and maximum is +4. The range is -4 to 4 lines.

Cisco ID3—Enable to allow the SCTE-104 information to be converted to ID3 on output.

Extended RS422 Status—When enabled, VTRs supporting the Extended Status Sense RS422 command returns extended status data. The extended status data is added to log files.

Video Mode (Applies only to 3G SDI Ports 1 & 5, model-dependent)—Specifies the type of signal that is attached to SDI ports and how to process it. Changing input sources from SD/HD to QuadLink UHD/4K is comprehensive—and performed in a series of steps—described in *Configuring Capture for SD/HD | UHD SDI Sources*.

Do not change this setting without performing one or both of the procedures. Enabling Loop Through (or reverting back) is also performed in a series of steps—see *Enabling QuadLink Loop Through* for the steps to take.

- *SingleLink Video Input*—Specifies that the source is either Standard Definition or High Definition video.
- *SingleLink Video Input with Loop Through*—Specifies an SD/HD source, routed back out through a paired SDI port.
- *QuadLink Video Input*—Specifies that the source is either UHD/4K video. When activated, all four SDI inputs are combined into one QuadLink UHD/4K source. All four signals of a UHD/4K source must match for UHD/4K mode to be activated,

unless Ignore Format Match Check is enabled (see following). Unmatched signals also occur when any UHD/4K sources are not currently playing video.

– *QuadLink Loop Thru Video Input* —Specifies a QuadLink UHD/4K source, routed back out through paired SDI ports (8-port 3G SDI cards only).

Initial Video Format—Specifies the video format of the incoming signal. This enables capture recovery to the proper frame size (SD/HD and UHD/4K) and rate during a temporary Loss of Signal. If a recurring workflow using a source with Initial Video Format set to the house format is set to record on activation and Ignore Lost Frames is enabled, recording begins when the Capture system is powered up without user intervention—using the specified format—even if there isn't yet a valid source to ingest.

Ignore Format Match Check (when source is specified as UHD/4K)—When enabled, maintains the UHD/4K source even if the signals do not have a matching signal. Only when there is no valid UHD/4K signal from all ports, does the output displays the LOS Video Test Pattern.

PsF Hint (for UHD only)—You should enable PsF Hint for 1080PsF25, 1080PsF29.97 and 1080PsF30 SDI sources that do not report PsF in the VPID payload so that it is processed appropriately. See *SDI Source Video Formats*.

Note: Live Capture always treats 23.98 | 24 PsF SDI sources as progressive.

3G SDI Signal Level (For 3G SDI SD/HD cards only)—Specifies the signal level of the SDI source. If the signal level is incorrect or mis-detected, the workflow may fail with a compressor error:. 3G level is detected automatically based on VPID data. If VPID data is not present or is incorrect, the signal level must be manually set:

– *Automatic*—Specifies that the Capture server auto-detects between Level A and B. Choose when the signal may be unknown or switch between A | B.

– *Level A*—Specifies direct mapping of uncompressed 1080p (up to 60 fps) video at 3Gb/s.

– *Level B*—Specifies Level B-DL format; mapping dual-link HD-SDI/SMPTE 372M (1080p up to 60 fps) at 3Gb/s.

Overlay Border on Loop Thru (For 3G SDI SD/HD cards only when set to Loop Thru)—When enabled, Live Capture displays a border around the preview panel during recording. Border color is controlled by the Overlay Border Color selection.

Overlay Source Name on Loop Thru (For 3G SDI SD/HD cards only when set to Loop Thru)—When enabled, Live Capture overlays the source name on the preview panel.

Overlay Timecode on Loop Thru (For 3G SDI SD/HD cards only when set to Loop Thru)—When enabled, Live Capture overlays the source timecode on the preview panel.

Overlay Workflows on Loop Thru (For 3G SDI SD/HD cards only when set to Loop Thru)—When enabled, Live Capture overlays the Vantage workflow name on the preview panel during recording.

Overlay Border Color (For 3G SDI SD/HD cards only when set to Loop Thru)—Specifies the color to display the border on the preview panel.

Overlay Border Thickness (For 3G SDI SD/HD cards only when set to Loop Thru)—Specifies the width (in pixels) of the border on the preview panel.

Quad-Link Image Division (when sources is specified as UHD/4K)—Specifies the method for processing image division. Image division is detected automatically based on VPID data. If VPID data is not present or is incorrect, image division must be manually set:

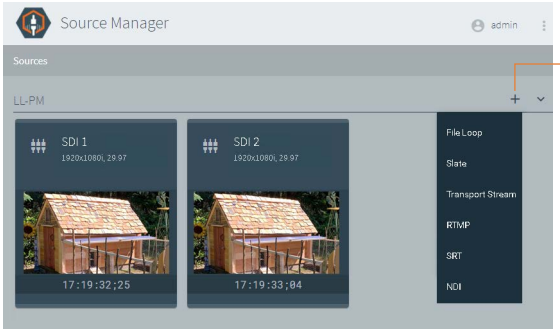
- *Automatic*—Specifies that Capture automatically detects the image division mode. Use of the Automatic setting requires a valid VPID signal from the source. See *SDI Source Video Formats* indicating when manual selection is required.
- *Square*—Specifies that when processing QuadLink Image Division, Capture uses the square-division method where the full image is divided into four quadrants.
- *2SI*—Specifies that when processing QuadLink Image Division, Capture uses two-sample interleave (2SI) method, sending two consecutive pixels to one of the four sub-images.

Creating & Configuring Transport Stream Sources

Capturing Transport Stream sources is an optional, licensed feature which requires a Manzanita Muxing for Capture license. For details, see *Live Capture Administration Guide > Array Licensing*.

Note: If you add a new network interface to a Live Capture server, you must stop and restart the Telestream Live Source service for a Transport Stream source to recognize it.

To create or edit a Transport Stream source, click the Add Input button in the Sources panel toolbar and select Transport Stream to display the Configure Source panel:

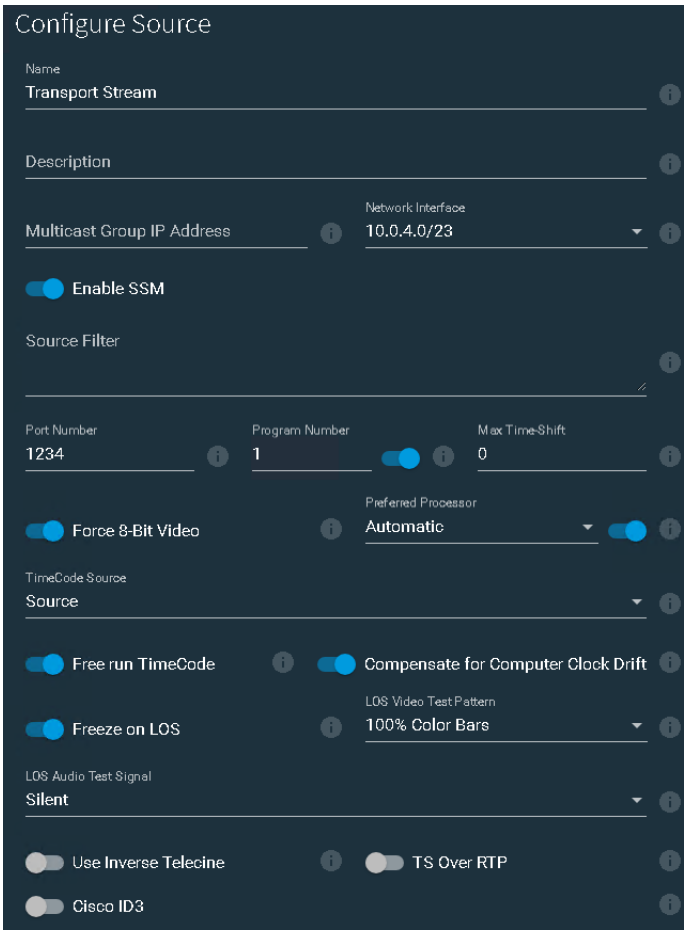


Note: You can only format IP sources using standard frame sizes and frame rates. See the Technical Specifications in the Live Capture product sheet on the Telestream web site for supported formats.

Note: While a source is being captured, you can only edit the source's name and description.

Telestream recommends limiting IP-based sources to eight, unless testing in your environment indicates you can support more.

Click Save to close the panel and create the transport stream source per your specifications.



Name—Specifies the name used to identify this source in Capture web apps and the Vantage Capture action. You can't change the name while the source is being captured.

When you name a source, observe these rules:

- Each source instance must be named uniquely.
- These characters are prohibited: ` * | \ : ; " ' < > ? /
- After changing a source name you must re-configure affected Capture actions in Vantage workflows that utilize the renamed source. See *Capture Action Overview and Configuration*.

The name cannot be changed when this source is connected. In a Capture array, when you create IP-based sources on more than one server, they should be named uniquely across the entire array for clarity.

Description—Practical description of the source.

Multicast Group IP Address—Specifies the multicast group IP address specified as the destination address of the MPEG2 Transport Stream via UDP. Transports streams are

usually sent to a multicast IP address, and the first octet is usually 239 or higher: For example: `239.33.44.55`. The Vantage Capture workflow listens on this address for the transport stream's UDP packets.

Network Interface—Specifies the local NIC (Network Interface Card)/IP address identified to receive this stream. Multiple NIC cards may be present on the server.

Note: When you add / change a network interface, change it from the disabled to enabled state, you must restart the Telestream Live Source Service for the service to recognize all interfaces, and update the Local NIC/IP Address menu. If the address displays `169.254.x.x` you also need to restart the Telestream Live Source Service.

Enable SSM—When Source Specific Multicast (SSM) is enabled, you can enter a list of source IP addresses for multicast, under Source Filter. Source-specific Multicast only delivers multicast packets that originate from a specific source address. SSM reduces network load and improves security.

Enable SSM when you have more than one multicast stream with the same settings and need to differentiate them. For example, two streams at 239.1.2.56:6700. Here, the streams are from two separate servers, each with different IP addresses. In Source Filter, you supply the IP address of the server streaming the stream you want to capture.

> **Source Filter**—When you enable SSM, the Source Filter field displays. Enter a list of accepted IP addresses for the multicast sources. Separate your IP addresses in the list by the return character, via the Enter/Return key.

Port Number—Specifies the port number to utilize.

Program Number—When enabled, specifies the program number (range 1-65535) in the PAT to capture, when multiple programs are present in the stream. When left blank, Live Capture assumes the source is unicast. When disabled, the first available program is used.

Max Time-Shift—Specifies the maximum duration of video that the time-shift frame buffer can hold, which is used to delay the source for workflows using this source. Specifies the duration in seconds (maximum: 10). Some limitations may exist for higher bit rates and frame rates.

Note: Live Capture's Time-Shift holds incoming source media frames in an internal FIFO buffer. See Live Capture Administration Guide > Determining the Time-Shift Buffer Duration for suggested settings for various frame sizes and rates.

When a capture workflow is activated with Time-Shift enabled, the source media is stored in the buffer, which allows Lightspeed Live to reach back in time and access media processed in the past, based on the value of the Time-Shift field. Since Live Capture's Time-Shift is always processing a source's media, when you start recording, any media stored in the buffer is available to be added to the capture file.

Force 8-Bit Video—8-bit video should only be used with 8-bit codecs such as XDCAM. When enabled, activates 8-bit down-sampling of the SDI video. Using 8-bit sampling

offers more efficient compression. Disable to utilize 10-bit video, which should be used for all 10-bit codecs such as ProRes.

Preferred Processor

Note: If this control doesn't display, processor balancing on this model server is performed automatically, and no end-user adjustment is available.

When enabled (C2+ and earlier), processing associated with each Capture | Tape job is assigned to the assigned CPU on the server's multi-core CPU to prevent inefficient process mapping across CPU sockets during heavy loads, typically when several sources are capturing concurrently.

On C4 and later models, for IP sources you can manually set affinity to a specific socket. If you create IP sources in order and use them in order, balancing is automatic. However, for example, if you delete every other IP source, the remaining sources do not balance and you can use can use this control to balance them. If IP sources are maintained long term, it may be helpful to assign each source a preferred processor.

Disabling this option during multi-source capturing may result in excessive CPU usage. When Preferred Processor is disabled, affinity is set to 0 (see Live Capture Administration Guide > Balancing CPU Processor Group Affinities).

Timecode Source—Sets the default timecode source. Choose one of the following timecode source signals for the selected Transport Stream source:

- *Source*—For H.264 or H.265 the source's SEI data is used, and for MPEG2 the source's GOP header timecode is used. If no valid source timecode is available, see the Free Run Timecode option below.
- *Computer Clock*—Uses time-of-day clock provided by the Live Capture server. When selected, also configure Compensate for Computer Clock Drift.

Caution: If your Lightspeed Live Server's Time Zone Setting is set to a time zone that does not have Daylight Savings Time, computer clock use UTC time, due to a Windows limitation.

- *None*—Specifies zero-based timecode recording. When recording begins, the timecode is set to 00:00:00:00. If Free Run Timecode is enabled, then the timecode inserted into a QuickTime or MXF file auto-increments. Otherwise, every frame in the output file contains timecode 00:00:00:00. Capture displays N/A on the workflow thumbnail, indicating that there is no applicable timecode available, and 00:00:00:00 displays in Capture's Preview timecode window.

Free Run Timecode—Enabling Free Run Timecode has no effect when Compensate for Computer Clock Drift is also enabled. When enabled, and the desired timecode is not detected or goes away, the timecode seamlessly free-runs from the last good timecode received. When Free Run Timecode is not enabled and the desired timecode is not detected or goes away, the timecode reverts to zero (00:00:00:00) and stays at zero.

Compensate for Computer Clock Drift—Only applies when Computer Clock is specified as Timecode Source.

Regardless of how Compensate for Computer Clock Drift is set, if packets are lost and frames are dropped, the Live Source process adds frames using the last good timecode in order to compensate for the lost frames. This may cause timecode values to be repeated where a frame was lost. If your Transport Stream signal is strong, this problem should not occur.

When Compensate for Computer Clock Drift is enabled

Computer Clock Time is monitored and compared to the timecode being added to the captured file. Since the Computer Clock is not gen-locked with a true time source associated with the incoming frames it can drift over time and get out of sync with the incoming stream. When a drift of one second is reached the timecode being added to the file is re-synced to the system's Computer Clock time. This means there may be a discontinuity in the file's timecode at the point where the re-sync occurred. Enabling Free Run Timecode when Compensate for Computer Clock Drift is enabled has no effect on the process described here.

When Compensate for Computer Clock Drift is Disabled

The source process uses the Computer Clock time without compensating for drift. Over time the timecode may drift several seconds compared to the 'real' time. For example—if a recording is 6 hours long the Computer Clock drift might be many seconds by the end of the 6 hour recording. If no frames were dropped the time-code in the output file is contiguous from start to finish.

Freeze on LOS—When enabled, causes the source to hold the last good frame if the signal is lost. When disabled, LOS causes the LOS Video Test Pattern to be displayed. For details, see *Loss of Signal Behavior*.

LOS Video Test Pattern—Select the test pattern to display during LOS.

LOS Audio Test Signal—Specifies the audio signal to use during LOS.

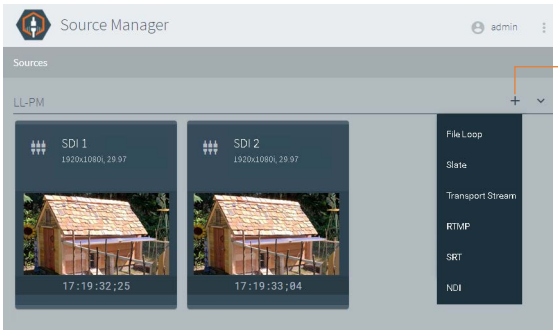
Use Inverse Telecine—Does not apply in Capture, because no frame-rate conversion is applied. Do not enable this control.

TS over RTP—Enable to receive transport streams wrapped in RTP packets.

Cisco ID3—Enable to allow the SCTE-104 information to be converted to ID3 for deliver to the Capture action.

Creating & Configuring RTMP Sources

To create and configure a new RTMP source, click the Add Input icon in the Sources panel toolbar and select RTMP to display the Configure Source panel:

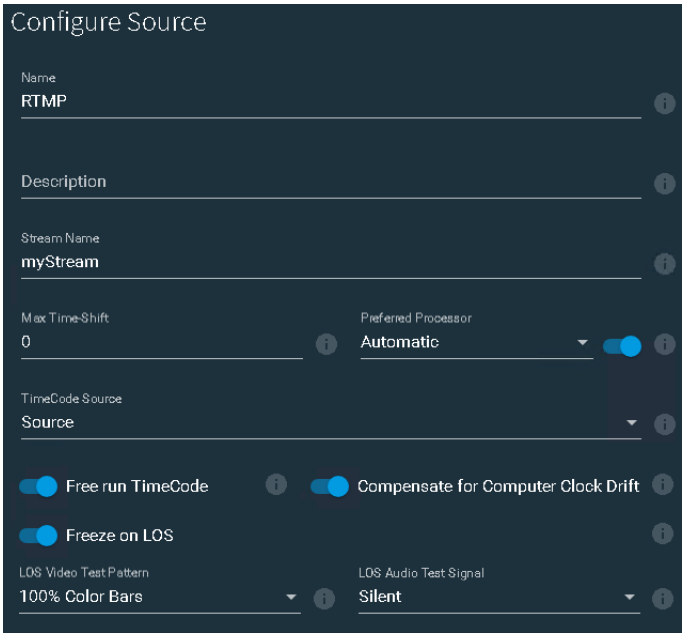


Click the + icon and select RTMP from the menu.

Note: You can only format IP sources using standard frame sizes and frame rates. See the Technical Specifications topic in the Live Capture product sheet on the Telestream web site for supported formats.
Once you have added and configured an RTMP source, you can only modify the name, description, and Preferred Processor. When you require an RTMP source with different settings, add a new RTMP source and configure it accordingly.

Telestream recommends limiting IP-based sources to eight, unless testing in your environment indicates you can support more.

For Live Capture systems with more than one server, you should name each separate Live Capture server's RTMP sources with unique names—for example, add the Live Capture server name as a prefix: *Lightspeed1-RTMP*.



When configuration is complete, click Save to close the panel and create the RTMP source per your specifications.

Name—Specifies the name used to identify this source in Capture web apps and the Vantage Capture action. You can't change the name while the source is being captured.

When you rename a source, observe these rules:

- Each source instance must be named uniquely.
- These characters are prohibited: ` * | \ : ; " ' < > ? /
- After changing a source name you must re-configure affected Capture actions in Vantage workflows that utilize the renamed source. See *Capture Action Overview and Configuration*.

Description—Practical description of the source.

Stream Name—Specifies the name (default: *myStream*) of this RTMP stream source. The RTMP stream name must match the incoming RTMP stream name.

Max Time-Shift—Specifies the maximum duration of video that the time-shift frame buffer can hold, which is used to delay the source for workflows using this source. Specifies the duration in seconds (maximum: 10). Some limitations may exist for higher bit rates and frame rates.

Note: Live Capture's Time-Shift holds incoming source media frames in an internal FIFO buffer. See Live Capture Administration Guide > Determining the Time-Shift Buffer Duration for suggested settings for various frame sizes and rates.

When a capture workflow is activated with Time-Shift enabled, the source media is stored in the buffer, which allows Lightspeed Live to reach back in time and access media processed in the past, based on the value of the Time-Shift field. Since Live Capture's Time-Shift is always processing a source's media, when you start recording, any media stored in the buffer is available to be added to the capture file.

Preferred Processor

Note: If this control doesn't display, processor balancing on this model server is performed automatically and no end-user adjustment is available.

When enabled (C2+ and earlier), processing associated with each Capture | Tape job is assigned to the assigned CPU on the server's multi-core CPU to prevent inefficient process mapping across CPU sockets during heavy loads, typically when several sources are capturing concurrently.

On C4 and later models, for IP sources you can manually set affinity to a specific socket. If you create IP sources in order and use them in order, balancing is automatic. However, for example, if you delete every other IP source, the remaining sources do not balance and you can use can use this control to balance them. If IP sources are maintained long term, it may be helpful to assign each source a preferred processor.

Disabling this option during multi-source capturing may result in excessive CPU usage. When Preferred Processor is disabled, affinity is set to 0.

Timecode Source—Specifies the default timecode source. Choose from the following timecode source signals:

- *Source*—For H.264 or H.265 the source's SEI data is used; for MPEG2 the source's GOP header timecode is used. If no valid source timecode is available, see Free Run Timecode below.
- *Computer Clock*— by the Live Capture server. When selected, also configure Compensate for Computer Clock Drift.

Caution: If your Lightspeed Live Server's Time Zone Setting is set to a time zone that does not have Daylight Savings Time, computer clock use UTC time, due to a Windows limitation.

- *None*—Specifies zero-based timecode recording. When recording begins, the timecode is set to 00:00:00:00. If Free Run Timecode is enabled, then the timecode inserted into a QuickTime or MXF file auto-increments. Otherwise, every frame in the output file contains timecode 00:00:00:00. Capture displays N/A on the workflow thumbnail, indicating that there is no applicable timecode available, and 00:00:00:00 displays in Capture's Preview timecode window.

Free Run Timecode—Enabling Free Run Timecode when Compensate for Computer Clock Drift is enabled has no effect. When enabled, and the desired timecode is not detected or goes away, the timecode seamlessly free-runs from the last good timecode received. When Free Run Timecode is not enabled and the desired timecode is not detected or goes away, the timecode reverts to zero (00:00:00:00) and stays at zero.

Compensate for Computer Clock Drift—Only applies when Computer Clock is specified as Timecode Source.

Regardless of how Compensate for Computer Clock Drift is set, if packets are lost and frames are dropped the Live Source process adds frames using the last good timecode in order to compensate for the lost frames. This may cause timecode values to be repeated where a frame was lost. If your Transport Stream signal is strong, this problem should not occur.

When Compensate for Computer Clock Drift is enabled

Computer Clock Time is monitored and compared to the timecode being added to the captured file. Since the Computer Clock is not gen-locked with a true time source associated with the incoming frames it can drift over time and get out of sync with the incoming stream. When a drift of one second is reached the timecode being added to the file is re-synced to the system's Computer Clock time. This means there may be a discontinuity in the file's timecode at the point where the re-sync occurred. Enabling Free Run Timecode when Compensate for Computer Clock Drift is enabled has no effect on the process described here.

When Compensate for Computer Clock Drift is Disabled

The source process uses the Computer Clock time without compensating for drift. Over time the timecode may drift several seconds compared to the 'real' time. For

example—if a recording is 6 hours long the Computer Clock drift might be many seconds by the end of the 6 hour recording. If no frames were dropped the time-code in the output file is contiguous from start to finish.

Freeze on LOS—When enabled, causes the source to hold the last good frame if the signal is lost. When disabled, LOS causes the LOS Video Test Pattern to be displayed. For details, see *Loss of Signal Behavior*.

LOS Video Test Pattern—Applies only when Freeze on LOS is disabled. Specifies the test pattern to display during LOS.

LOS Audio Test Signal—Specifies the audio signal to use during LOS.

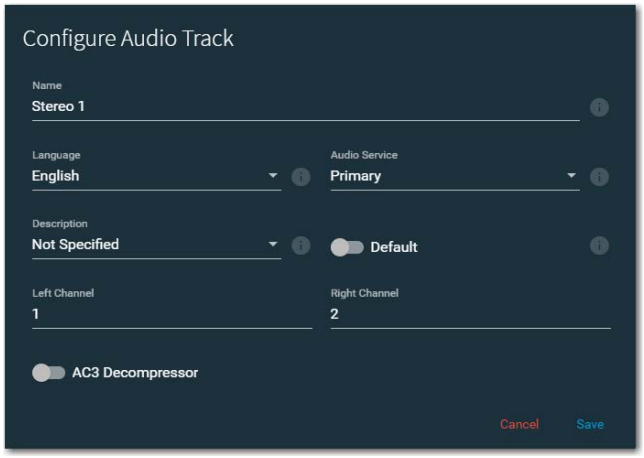
Tagging AC3 Audio Embedded in PCM

If the audio in a source is AC3, you must indicate it as such, so that the Vantage Capture workflow can process it properly.

Note: The only audio track setting that applies to Live Capture is the AC3 Decompressor. No other settings apply.

To identify a track as AC3, follow these steps:

1. Select the source to display its preview panel.
2. Click the Audio Tracks tab and select the track you are working on.
3. Click the Edit icon to display the Configure Audio Track panel:



4. Enable the AC3 Decompressor control and click Save.

When enabled, AC3 audio embedded in PCM is decoded at the source level and passed on as PCM, for use directly in the primary or secondary outputs and the Preview panel of a Live system. When the AC3 Decompressor is enabled, the affected source's Live Source process restarts automatically.

Creating & Configuring SRT Sources

Live Capture supports SRT (Secure Reliable Transport)—an IP-based, open-source video streaming transport protocol—that provides secure, low-latency streaming performance over noisy or lossy networks such as the public Internet.

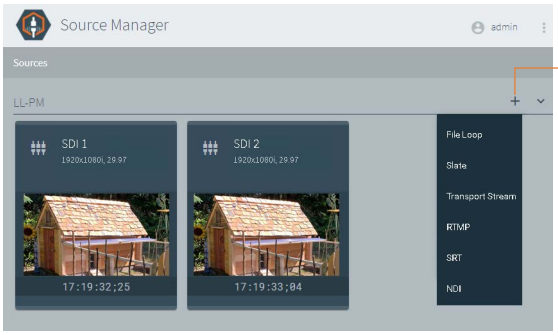
SRT testing was performed for these profiles:

- High 422 8/10-bit 420/422
- High 10 420 8/10-bit
- High 420 8-bit
- Main 420 8-bit
- Baseline 420 8-bit.

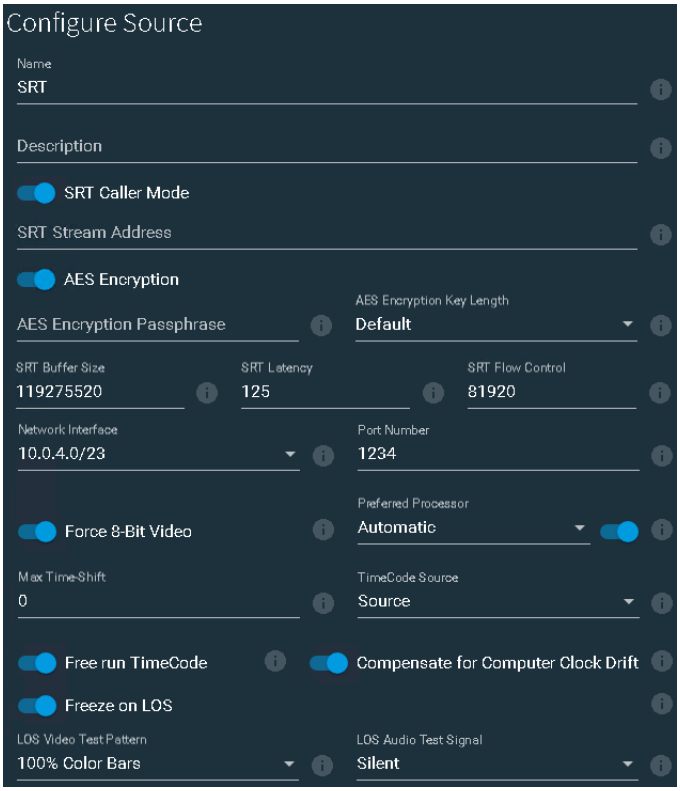
Note: You can only format IP sources using standard frame sizes and frame rates. See the technical specifications in the Live Capture product sheet on the Telestream web site for supported formats.
While a source is being captured, you can only edit the source's name. To modify other settings in the configuration, first stop recording the source in Live Capture.

Telestream recommends limiting IP-based sources to eight, unless testing in your environment indicates you can support more.

To create and configure an SRT source, click the Add Input icon in the Sources panel toolbar:



Select SRT from the menu to display the Configure Source panel:



Name—Specifies the name used to identify this source in Capture web apps and the Vantage Capture action. You can't change the name while the source is being captured.

When you rename a source, observe these rules:

- Each source instance must be named uniquely.
- These characters are prohibited: ` * | \ : ; " ' < > ? /
- After changing a source name you must re-configure affected Capture actions in Vantage workflows that utilize the renamed source. See *Capture Action Overview and Configuration*.

For Live Capture systems with more than one server, you should name each separate Lightspeed Live Server's SRT sources with unique names—for example, add the Lightspeed Live Server name as a prefix: *Lightspeed1-SRT*.

Description—Practical description of the source.

SRT Caller Mode—Enable this option to establish an SRT link between your SRT source and destination device when required, where this device is the caller.

SRT Stream Address—SRT sources are created in Listener mode by default. When Caller Mode is enabled, specify the IP address of the listener device. The stream must be started, and the IP address must be valid, or you can't save the configuration.

AES Encryption—Enable to implement AES encryption on this source.

AES Encryption Passphrase—When AES encryption is enabled, supply a pass phrase (10-79 characters).

AES Encryption Key Length—When AES encryption is enabled, specify the key length from the menu.

SRT Buffer Size (in bytes,) SRT Latency (in ms,) and SRT Flow Control (in packets)—configurable parameters for the Live Source SRT receiver.

Telestream recommends using the default settings unless Live Capture is capturing a ingesting a sub-optimal stream or other circumstances arise, requiring value changes to improve capture.

Changes to the settings should be made with an understanding of the relationship between the settings.

Increasing SRT Latency can help stabilize ingest of an SRT stream under poor network conditions, but it adds to the amount of time before Live Capture can begin recording the stream, which may not be desirable for live events. If the SRT stream logs or an external analyzer such as InspectLive indicates packet retransmission or packet loss, the latency should be increased.

SRT Buffer Size and SRT Flow Control values are dependent on several factors, including the bitrate of the incoming stream, configured latency, and to a lesser extent, the RTT (round trip time) of the network connection. This online configuration tool can help determine the optimal relationship between the settings.

Finally, the SRT Flow Control value is dependent on the SRT Buffer size, and this value, multiplied by the packet size (1472) must be larger than the SRT buffer size. For example, 81920x1472=~120.5MB, which is higher than the default SRT Buffer Size of 120 MB.

If the SRT Buffer Size is not smaller than this value, you can not save the configuration.

Detailed documentation of the SRT protocol is beyond the scope of this guide. Haivision provides an excellent technical reference: *srt/docs/API/configuration-guidelines.md at master · Haivision/srt · GitHub*.

Network Interface—Specifies the Live Capture server's NIC IP address, including the subnet mask configured on the interface.

Port Number—Specifies the port number to utilize for both listener and caller mode.

Force 8-Bit Video—Forces a 10-bit source to be down-sampled to 8-bit.

8-bit video should only be used with 8-bit codecs such as XDCAM. Using 8-bit sampling offers more efficient compression.

Preferred Processor

Note: If this control doesn't display, processor balancing on this model server is performed automatically, and no end-user adjustment is available.

When enabled (C2+ and earlier), processing associated with each Capture | Tape job is assigned to the assigned CPU on the server's multi-core CPU to prevent inefficient process mapping across CPU sockets during heavy loads, typically when several sources are capturing concurrently.

On C4 and later models, for IP sources you can manually set affinity to a specific socket. If you create IP sources in order and use them in order, balancing is automatic. However, for example, if you delete every other IP source, the remaining sources do not balance and you can use can use this control to balance them. If IP sources are maintained long term, it may be helpful to assign each source a preferred processor.

Disabling this option during multi-source capturing may result in excessive CPU usage. When Preferred Processor is disabled, affinity is set to 0 (see Live Capture Administration Guide > Balancing CPU Processor Group Affinities).

Max Time-Shift—Specifies the maximum duration of video that the time-shift frame buffer can hold, which is used to delay the source for workflows using this source. Specifies the duration in seconds (max. 10). Sources with higher bit rates and frame rates may reduce duration.

Note: Live Capture's Time-Shift holds incoming source media frames in an internal FIFO buffer. See Live Capture Administration Guide > Determining the Time-Shift Buffer Duration for suggested settings for various frame sizes and rates.

When a capture workflow is activated with Time-Shift enabled, the source media is stored in the buffer, which allows Lightspeed Live to reach back in time and access media processed in the past, based on the value of the Time-Shift field. Since Live Capture's Time-Shift is always processing a source's media, when you start recording, any media stored in the buffer is available to be added to the capture file.

Timecode Source—Specifies the default timecode source. Choose from the following timecode source signals:

- *Source*—For H.264 or H.265 the source's SEI data is used; for MPEG2 the source's GOP header timecode is used. If no valid source timecode is available, see Free Run Timecode below.
- *Computer Clock*— by the Live Capture server. When selected, also configure Compensate for Computer Clock Drift.

Caution: If your Lightspeed Live Server's Time Zone Setting is set to a time zone that does not have Daylight Savings Time, computer clock use UTC time, due to a Windows limitation.

- *None*—Specifies zero-based timecode recording. When recording begins, the timecode is set to 00:00:00:00. If Free Run Timecode is enabled, then the timecode inserted into a QuickTime or MXF file auto-increments. Otherwise, every frame in the output file contains timecode 00:00:00:00. Capture displays N/A on the workflow thumbnail, indicating that there is no applicable timecode available, and 00:00:00:00 displays in Capture's Preview timecode window.

Free Run Timecode—Enabling Free Run Timecode when Compensate for Computer Clock Drift is enabled has no effect. When enabled, and the desired timecode is not detected or goes away, the timecode seamlessly free-runs from the last good timecode received. When Free Run Timecode is not enabled and the desired timecode is not detected or goes away, the timecode reverts to zero (00:00:00:00) and stays at zero.

Compensate for Computer Clock Drift—Only applies when Computer Clock is specified as *Timecode Source*.

Regardless of how Compensate for Computer Clock Drift is set, if packets are lost and frames are dropped the Live Source process adds frames using the last good timecode in order to compensate for the lost frames. This may cause timecode values to be repeated where a frame was lost. If your Transport Stream signal is strong, this problem should not occur.

When Compensate for Computer Clock Drift is enabled

Computer Clock Time is monitored and compared to the timecode being added to the captured file. Since the Computer Clock is not gen-locked with a true time source associated with the incoming frames it can drift over time and get out of sync with the incoming stream. When a drift of one second is reached the timecode being added to the file is re-synced to the system's Computer Clock time. This means there may be a discontinuity in the file's timecode at the point where the re-sync occurred. Enabling Free Run Timecode when Compensate for Computer Clock Drift is enabled has no effect on the process described here.

When Compensate for Computer Clock Drift is Disabled

The source process uses the Computer Clock time without compensating for drift. Over time the timecode may drift several seconds compared to the 'real' time. For example—if a recording is 6 hours long the Computer Clock drift might be many seconds by the end of the 6 hour recording. If no frames were dropped the time-code in the output file is contiguous from start to finish.

Freeze on LOS—When enabled, causes the source to hold the last good frame if the signal is lost. When disabled, LOS causes the LOS Video Test Pattern to be displayed. For details, see *Loss of Signal Behavior*.

LOS Video Test Pattern—Applies only when Freeze on LOS is disabled. Specifies the test pattern to display during LOS.

LOS Audio Test Signal—Specifies the audio signal to use during LOS.

Creating & Configuring NDI Sources

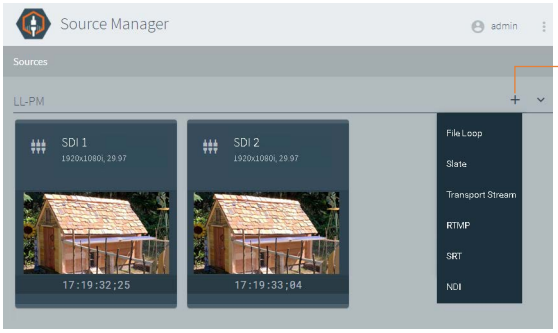
NDI (Network Device Interface) is a royalty-free software specification to enable video-compatible products to communicate, deliver, and receive high-definition video over gigabit Ethernet networks in a high-quality, low-latency, frame-accurate manner and suitable for switching in a live production environment.

Video is limited to HD and 16 audio channels.

Live Source supports a Loss of Signal state to maintain the channel when there is no active signal from an established NDI source, but the video (frame rate, frame size, bit depth, etc.) and audio (channel count, bit depth) cannot change when the signal is re-established.

NDI Access Discovery Method requires TCP port 5960.

To create and configure a new NDI source, click the Add Input icon in the Sources panel toolbar and select NDI to display the Configure Source panel:

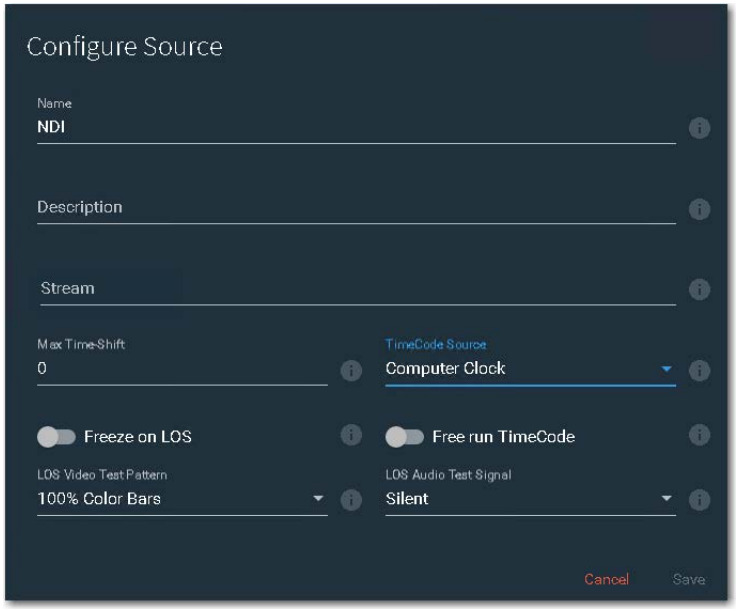


If you require an NDI source channel from a new NDI source, Telestream recommends that you create a new NDI source channel and configure it, instead of editing an existing NDI source.

Note: You can only format IP sources using standard frame sizes and frame rates. See the Technical Specifications topic in the Live Capture product sheet on the Telestream web site for supported formats.

Telestream recommends limiting IP-based sources to eight, unless testing in your environment indicates you can support more.

For Live Capture systems with more than one server, you should name each separate Lightspeed Live Server's NDI sources with unique names—for example, add the Lightspeed Live Server name as a prefix: *Lightspeed1-NDI*.



When configuration is complete, click Save to close the panel and create the NDI source per your specifications.

Name—Specifies the name used to identify this source in Capture web apps and the Vantage Capture action. You can't change the name while the source is being captured.

When you name a source, observe these rules:

- Each source instance must be named uniquely.
- These characters are prohibited: ` * | \ : ; " ' < > ? /
- After changing a source name you must re-configure affected Capture actions in Vantage workflows that utilize the renamed source. See *Capture Action Overview and Configuration*.

Description—Practical description of the source.

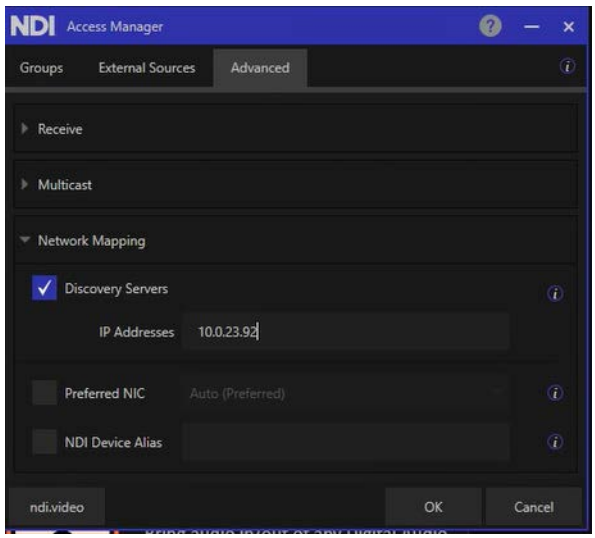
Stream—Specifies the identity of the NDI stream.

Live Capture supports NDI Access Discovery Method (active polling). This method supports discovery both within the same subnet and across subnets. If the NDI sources are on the same subnet as the Lightspeed Live server, the Source menu in the NDI Source Configuration panel auto-populates and displays the list of NDI sources that are discoverable.

If the NDI sources are not on the same subnet, the Source menu in the NDI Source Configuration panel auto-populates and displays the list of NDI sources that are identified in the *NdiSources.config* file.

If the NDI sources are not on the same subnet, update the configuration file.

- Install NDI Tools V5 before proceeding. NDI Access Manager is not installed with Live Capture, it is part of NDI tools.
- Now, add the NDI source or the NDI source's IP address using the NDI Tools Access Manager application in NDI Tools to update the config file:



OR

- Enter the IP address of the NDI source in *C:\Program Files\Telestream\Live Source Server\NdiSources.config*.

Restart the Telestream Live Source Service.

Max Time-Shift—Specifies the maximum duration of video that the time-shift frame buffer can hold, which is used to delay the source for workflows using this source. Specifies the duration in seconds (maximum: 10). Some limitations may exist for higher bit rates and frame rates.

Note: Live Capture's Time-Shift holds incoming source media frames in an internal FIFO buffer. See Live Capture Administration Guide > Determining the Time-Shift Buffer Duration for suggested settings for various frame sizes and rates.

When a capture workflow is activated with Time-Shift enabled, the source media is stored in the buffer, which allows Lightspeed Live to reach back in time and access media processed in the past, based on the value of the Time-Shift field. Since Live Capture's Time-Shift is always processing a source's media, when you start recording, any media stored in the buffer is available to be added to the capture file.

Timecode Source—Choose one of the following timecode source signals for the selected source:

- *Source*—Uses embedded timecode in the source ancillary stream, if present. If a valid timecode is not available or goes away, see the Free Run Timecode option below.
- *Computer Clock*—Uses the time-of-day clock provided by the Live Capture server. When selected, also configure Compensate for Computer Clock Drift.

Caution: If your Lightspeed Live Server's Time Zone Setting is set to a time zone that does not have Daylight Savings Time, computer clock should use UTC time, due to a Windows limitation.

- *None*—Specifies zero-based timecode recording. When recording begins, the timecode is set to 00:00:00:00. If Free Run Timecode is enabled, then the timecode inserted into a QuickTime or MXF file auto-increments. Otherwise, every frame in the output file contains timecode 00:00:00:00. Capture displays *N/A* on the workflow thumbnail, indicating that there is no applicable timecode available, and 00:00:00:00 displays in Capture's Preview timecode window.

Note: When using the CalDAV Calendar trigger you should set Timecode Source to either *Computer Clock* or *Source*. When using Source, you must have time-of-day timecode in your source that matches the time set in your Lightspeed Live Server. See *Configuring Trigger Settings*.

Freeze on LOS—When enabled, causes the source to hold the last good frame if the signal is lost. When disabled, LOS causes the LOS Video Test Pattern to be displayed. For details, see *Loss of Signal Behavior*.

Free Run Timecode—When enabled, starts timecode from 0 if there is no embedded timecode in the source.

When enabled, and the timecode is not detected or goes away, the timecode seamlessly free-runs from the last good timecode received. When not enabled and the timecode is not detected or goes away, then the timecode reverts to zero (00:00:00:00) and stays at zero.

LOS Video Test Pattern—Applies only when Freeze on LOS is disabled. Specifies the test pattern to display during LOS.

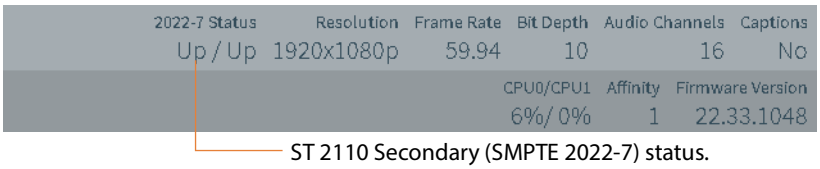
LOS Audio Test Signal—Specifies the audio signal to use during LOS.

Creating and Configuring ST 2110 Sources

You can ingest ST 2110 sources on a C2+ | C4 | VC-100 | VC-300 Lightspeed Live Server equipped for ST 2110 + NMOS, which includes a dual-port 25/100Gb Ethernet NIC, with redundant backup via SMPTE 2022-7. On other servers, ST 2110 sources are not supported.

Note: See *Live Capture Administration Guide > Lightspeed Live Server Resource Requirements > Processes & Factors Affecting Performance* for limits on ingesting ST 2110 video streams. Also, see the Technical Specifications in the Live Capture product sheet on the Telestream web site for supported formats.

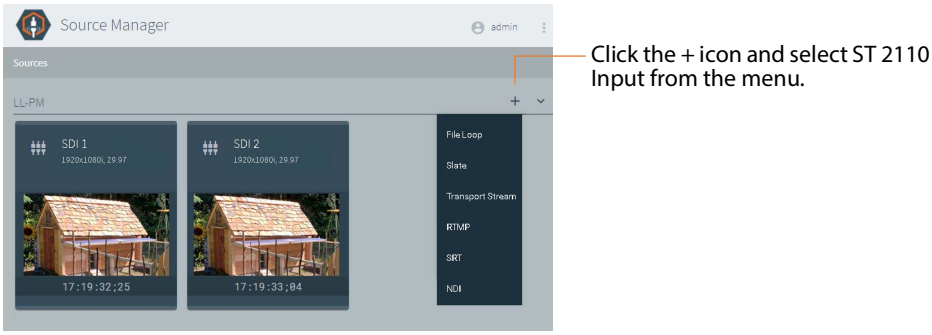
When the secondary NIC port is used for an ST 2110 source, Live Source displays an indication of the 2022-7 status in the source statistics panel:



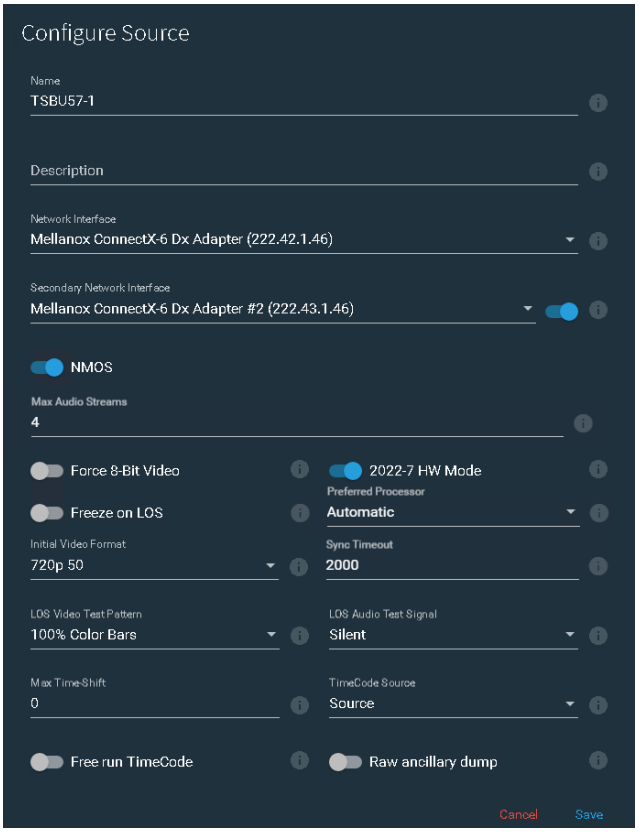
You can also view an ST 2110 channel card to determine primary and secondary channel status (see *Channel Card Details | Status | Controls*). Green up arrows indicate a connection; red down arrows indicate the ST 2110 source is disconnected.

To modify an ST 2110 source configuration, select it in the Sources panel to display its Preview panel. Click the Edit icon to display its Configure Source panel.

To create an ST 2110 source (using text / HTML SDP files or NMOS), click the Add Input + icon in the Sources panel toolbar:



Select ST 2110 to display its Configure Source panel, shown here with NMOS enabled:



When configuration is complete, click Save to close the panel to create or update the ST 2110 source per your specifications.

Name—Specifies the name to use in Capture web apps and the Vantage Capture action. You can't change the name while the source is being captured.

When you name a source, observe these rules:

- Each source instance must be named uniquely.
- These characters are prohibited: `` ` * | \ : ; " ' < > ? / ``
- After changing a source name you must re-configure affected Capture actions in Vantage workflows that utilize the renamed source. See *Capture Action Overview and Configuration*.

Description—Practical description of the source.

Network Interface | Secondary Network Interface—Specifies the primary and secondary Mellanox Ethernet NIC. These names are auto-populated from the names associated with the NIC directly in Windows NIC properties.

NMOS —If your video network utilizes NMOS (Networked Media Open Specification), enabling NMOS hides the SDP fields and enables the Live Source NMOS node, device, and receivers (video, audio and data) to be discoverable in an NMOS registry and an NMOS browser/explorer.

To set NMS logging levels on your Capture server, see Live Capture Administration Guide > Setting NMOS Logging Levels.

The Live Source NMOS Node Server (per AMWA IS-04 NMOS Discovery and Registration Specification) dynamically interfaces with the NMOS infrastructure; adding, deleting, updating or retrieving NMOS information associated with an ST 2110 source (per AMWA IS-05 NMOS Device Connection Management Specification).

When NMOS is Enabled...

When NMOS is enabled, Source Manager displays Max Audio Streams:

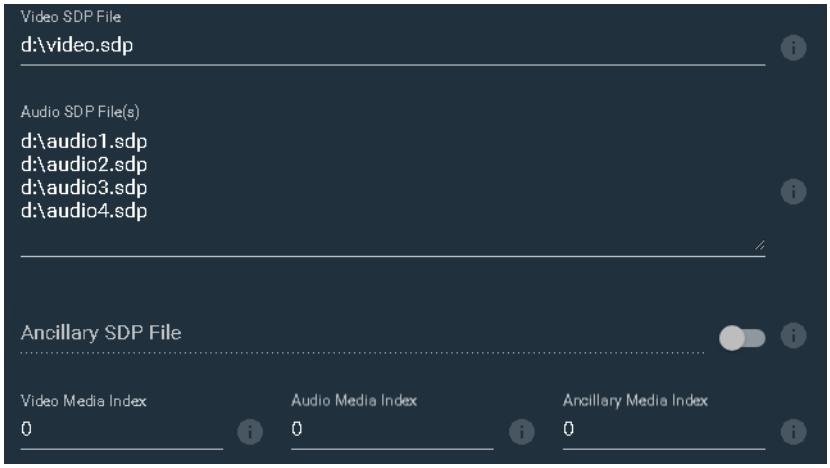
Max Audio Streams—Create up to 4 discrete NMOS audio receivers.

Each audio receiver supports Level A (up to 8 channels @ 48 kHz 1 ms packet) ST2110-30 audio streams, or Level C (up to 64 channels @ 48 kHz 0.125 ms packet).

Limitations: All audio streams must be LPCM format with the same packet size, bit depth and bitrate, and all ST2110 streams must have the same timecode in order to be synced.

When NMOS is Disabled...

When NMOS is disabled, SDP File controls display so that you can specify them:



Video SDP File—Specifies the URL of the required SDP file for use with a video stream (may be either text or HTML files).

Audio SDP File(s)—Specifies the URL of the required SDP file(s) for use with audio streams (may be text or HTML files). Up to 4 permitted, each on a separate line.

Ancillary SDP File—When enabled, specifies optional SDP file URL for use with ANC data streams. In order to receive closed captions data and VITC timecode, a valid ANC data stream is required (may be text or HTML file).

Video | Audio | Ancillary Media Index—Specifies the index of the file.

Force 8-Bit Video—Forces a 10-bit source to be down-sampled to 8-bit. Unlike SDI sources which are inherently 10-bit but are rendered to either 8- or 10-bit frames by the AJA card, the ST 2110 source data may be any bit depth supported by the standard. The

bit depth is specified in the video SDP file. Force 8-bit works regardless if NMOS is enabled or not. NMOS wraps an SDP description, and Live Source manager can convert it to a 10-bit or an 8-bit video format internally.

8-bit video should only be used with 8-bit codecs such as XDCAM. Using 8-bit sampling offers more efficient compression.

2022-7 HW Mode (Default: Enabled)—Enables 2022-7 hardware mode when the SDP configuration file for source streams specifies an associated secondary stream. In 2022-7 HW mode, inbound packet processing is offloaded to the Mellanox Ethernet NIC instead of being performed in software, which consumes server memory and CPU resources.

Freeze on LOS—When enabled, causes the source to hold the last good frame if the signal is lost. When disabled, LOS causes the LOS Video Test Pattern to be displayed. For details, see *Loss of Signal Behavior*.

Preferred Processor

Note: If this control doesn't display, processor balancing on this model server is performed automatically, and no end-user adjustment is available.

When enabled (C2+ and earlier), processing associated with each Capture | Tape job is assigned to the assigned CPU on the server's multi-core CPU to prevent inefficient process mapping across CPU sockets during heavy loads, typically when several sources are capturing concurrently.

On C4 and later models, for IP sources you can manually set affinity to a specific socket. If you create IP sources in order and use them in order, balancing is automatic. However, for example, if you delete every other IP source, the remaining sources do not balance and you can use can use this control to balance them. If IP sources are maintained long term, it may be helpful to assign each source a preferred processor.

Disabling this option during multi-source capturing may result in excessive CPU usage. When Preferred Processor is disabled, affinity is set to 0 (see Live Capture Administration Guide > Balancing CPU Processor Group Affinities).

Initial Video Format (SD formats not supported). Initial Video Format enables a recording session to start before signal is established, so that a recording in progress does not get locked as loss of signal at 1080p30. This is especially useful when you are using a workflow with recurring segments or it is set to activate on power up, or signal is lost or power is lost temporarily. When the ST 2110 Source loses connection with the sender, the video is replaced with a test signal as configured in Initial Video Format.

Specifies the video format to ingest when no video signal is being received. When the signal starts or restarts (and ignore lost frames is enabled in the Live Capture workflow), the signal is recorded, provided that is the same format as initial video format you have specified.

Sync Timeout—ST 2110 sources consist of multiple streams: video, audio, and ancillary data. When more than one stream in a given source is patched, Live Capture attempts to align the timestamps of the streams so they are in sync. If it can't sync the streams in

less than the time (in milliseconds) in this field (2000 ms by default) it displays an error, and does not add the stream.

LOS Video Test Pattern—Applies only when Freeze on LOS is disabled. Specifies the test pattern to display during LOS. For details, see *Loss of Signal Behavior*.

LOS Audio Test Signal—Specifies the audio signal to use during LOS.

Max Time-Shift—Specifies the maximum duration of video that the time-shift frame buffer can hold, which is used to delay the source for workflows using this source. Specifies the duration in seconds (maximum: 10). Some limitations may exist for higher bit rates and frame rates.

Note: Live Capture's Time-Shift holds incoming source media frames in an internal FIFO buffer. See Live Capture Administration Guide > Determining the Time-Shift Buffer Duration for suggested settings for various frame sizes and rates.

When a capture workflow is activated with Time-Shift enabled, the source media is stored in the buffer, which allows Lightspeed Live to reach back in time and access media processed in the past, based on the value of the Time-Shift field. Since Live Capture's Time-Shift is always processing a source's media, when you start recording, any media stored in the buffer is available to be added to the capture file.

Timecode Source—Click the menu to choose one of the following timecode source signals for the selected input:

- *Source*—Uses the ST2110-40 ancillary data stream in the source ancillary stream, if present. If a valid timecode is not available or goes away, see the Free Run Timecode option below.
- *Computer Timecode*—Uses the time-of-day clock provided by the Live Capture Server. When selected, also configure Compensate for Computer Clock Drift.

Caution: If your Lightspeed Live Server's Time Zone Setting is set to a time zone that does not have Daylight Savings Time, computer clock should use UTC time, due to a Windows limitation.

- *None*—Specifies zero-based timecode recording. When recording begins, the timecode is set to 00:00:00:00. If Free Run Timecode is enabled, then the timecode inserted into a QuickTime or MXF file auto-increments. Otherwise, every frame in the output file contains timecode 00:00:00:00. Live Capture displays N/A on the workflow thumbnail, indicating that there is no applicable timecode available, and 00:00:00:00 displays in Capture's Preview timecode window.

Note: When using the CalDAV Calendar trigger you should set Timecode Source to either *Computer Clock* or *Source*. When using *Source*, you must have time-of-day timecode in your source that matches the time set in your Lightspeed Live Server. See *Configuring Trigger Settings*.

Free Run Timecode—When enabled, starts the timecode from 0 if there is no embedded timecode in the source.

When enabled, and the timecode is not detected or goes away, the timecode seamlessly free-runs from the last good timecode received. When not enabled and the timecode is not detected or goes away, then the timecode reverts to zero (00:00:00:00) and stays at zero.

Raw Ancillary Dump—When enabled and the output container is set to TIFO, the SDI input's ancillary data is inserted directly into the Primary Output file

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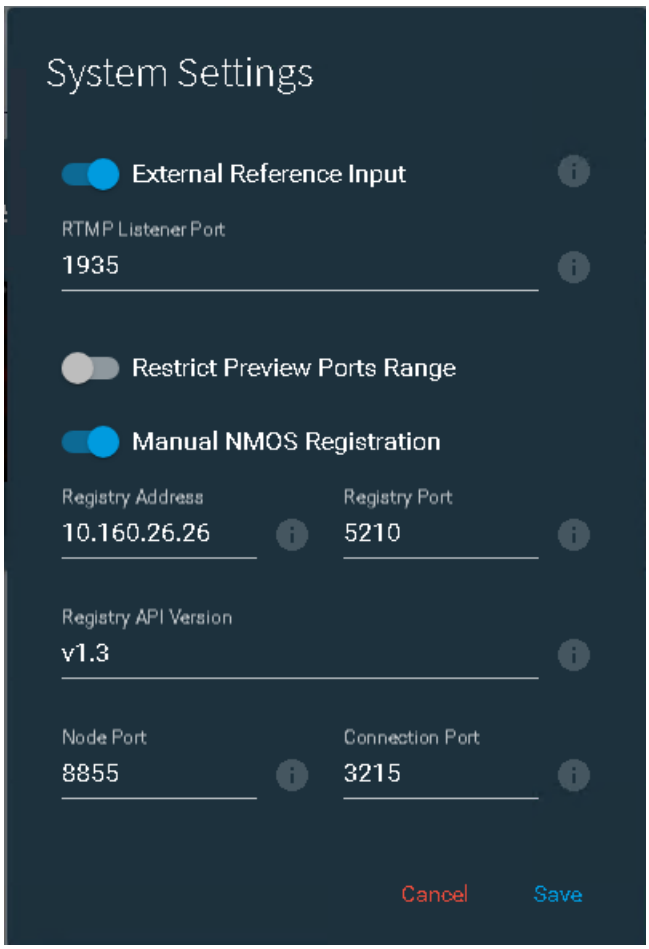
Caution: Do not enable this option unless directed by Telestream Support.

Managing System Settings

Click Source Manager's More menu > Settings to display the System Settings dialog



Use this panel to configure these controls to meet your requirements:

External Reference Input—For SDI-based Live Capture server, enable to synchronize looped-through outputs to external reference—see *Using External Reference (REF) for SDI Monitoring* for details.

Note: On Live Capture systems (Software-only | ST 2110 + NMOS) that do not have an SDI card installed, this setting is non-functional.

RTMP Listener Port—Specifies the RTMP listener port. Default: 1935. If you change the listener port, be certain the RTMP server is also sending to the same port. Be sure to restart the Telestream Live Source Service—see *Live Capture Administration Guide* > *Restarting the Telestream Live Source Service* for guidance.

Restrict Preview Ports Range—When enabled, restricts the range of preview ports that you can automatically select when the selection may interfere with other network traffic. Default lower and upper range: 1024 to 65534. Be sure to restart the Telestream Live Source Service—see *Live Capture Administration Guide* > *Restarting the Telestream Live Source Service* for guidance.

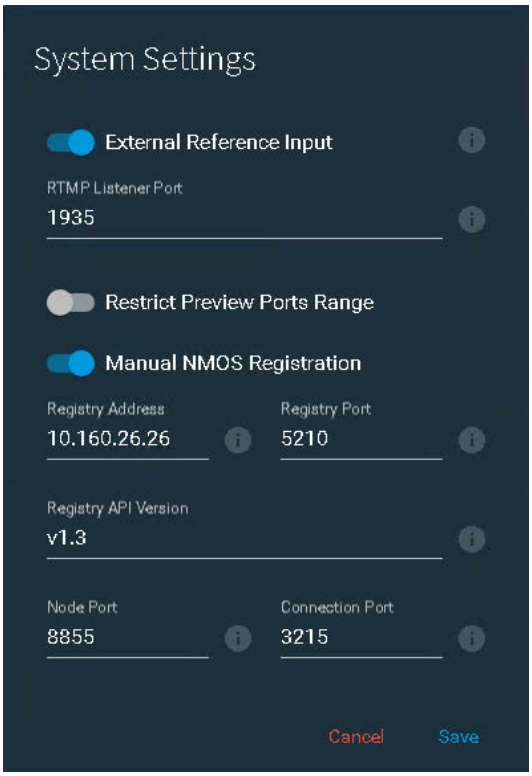
- **Port Range Start | End**—Specifies the lowest and highest port to use. The Start value must be lower than Port Range End value.

Manual NMOS Registration—Displays only on Live Capture systems configured for use for ST 2110, with a Mellanox card installed. When enabled, specify the NMOS registry controls to update the NMOS configuration file. Disable the control to remove all settings from the configuration file. See the Live Capture Administration Guide > Manually Configuring NMOS Registration Settings for details.

Click Save to update changes you have made.

Manually Configuring NMOS Registration Settings

When you enable Manual NMOS Registration in the System Settings dialog, Source Manager displays the NMOS controls:



Configure these controls to meet your requirements:

Registry Address—the IP address of the NMOS registry server

Registry Port—the port of the NMOS registry server

Registry API Version—the version of the AMWA IS-04 Query API that is in use in the NMOS registry environment. Live Source uses version 1.3 by default.

Node Port—the NMOS node port; default: 4212.

Connection Port—the connection port for AMWA IS-05 Device Connection Management; default: 3215.

Click Save to update the NMOS Registration configuration file and restart the Telestream Source Service for changes to take effect.

Using External Reference (REF) for SDI Monitoring

Lightspeed Live Servers manufactured beginning October 2022 with Corvid 44, Corvid 88, and 12G SDI video cards have an additional connector intended for timecode. This LTC timecode reference connector has been added at the far right of the card. You can use the Reference connector (labeled *R*) previously used for LTC on these cards for a Bi-Level or Tri-Level Sync signal. You can also use this Reference connector to synchronize looped-through outputs from Live Source Manager to external reference in Live Capture.

Lightspeed Live Servers so-equipped display the External Reference Input control in the System Settings panel.

Note: On Live Capture systems (Software-only | ST 2110 + NMOS) that do not have an SDI card installed, this setting is non-functional.

When External Reference Input is enabled, the Ref port reads a black burst / Bi-Level / Tri-Level Sync signal, as opposed to analog LTC signal. The LTC port reads the analog LTC signal. If the External Reference Input is disabled, then the system is configured for Reference input (R) to accept LTC, and the LTC input is ignored.

Restart the Lightspeed Live Server to make this change take effect.

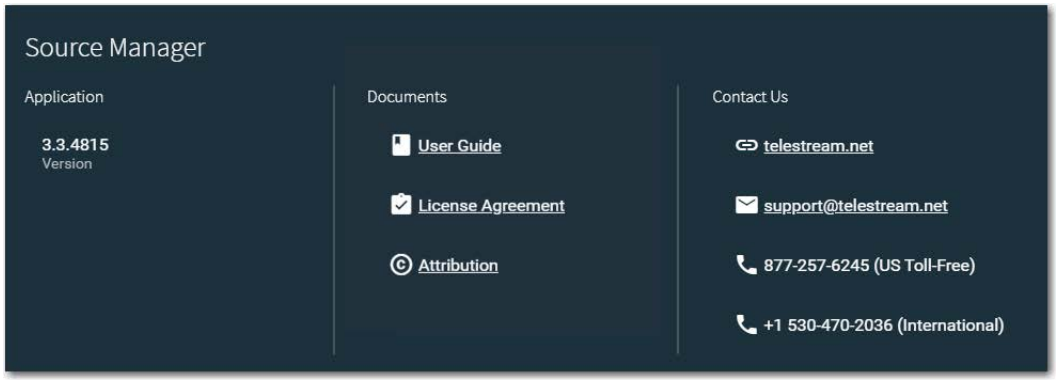
For Ref and LTC connection details, see the Live Capture Administration Guide > Making Data and Signal Connections.

Downloading System Logs

On occasion, you may need to download system logs for technical assistance. You can zip up and download Live Capture system logs to your computer for archival purposes, for review, or in preparation for use in a customer service case. For details, see Downloading System Logs Files in the Live Capture Administration Guide.

Version Info | Help | Documents | Contact Methods

Click the More menu > About to display the Source Manager panel:



This panel provides the following:

- Source Manager version number
- Live Capture User Guide and legal documents—license agreements and copyright attribution statements
- Telestream customer service contact information—email, web site and telephone numbers.

Troubleshooting

Can’t Start the Group Portal Web App

You’re trying to launch the Group Portal web app, and Chrome displays this error: “This site can’t be reached”.

Resolution

Try these potential problems and retry:

- If you’re using *localhost*, make sure you’re on the target Lightspeed Live Server where Telestream Live Source Service is running.
- If you’re using a host name, verify that it is correct for the target Lightspeed Live Server.
- Open the Services panel and verify that Telestream Live Source Service is running; start if it isn’t.