

VOS Cloud-Native Software 1.19.1 User Guide

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Introduction

VOS® Cloud-Native Software is an infrastructure-independent media processing application that makes it easy for you to migrate back and forth between bare metal datacenter computing, and private clouds. VOS Cloud-Native Software allows you to launch new video channels fast with exceptional video quality, and run simpler, leaner operations. VOS Cloud-Native Software can be integrated seamlessly into your existing operations, making it easy to add services to your workflow in a matter of minutes.

VOS Cloud-Native Software capitalizes on Harmonic's expertise in media processing, embedding market-leading state-of-the-art micro services such as ingest, compression, encryption, packaging and origin server in a unified software solution.

Streamlined and consolidated workflows are built by simply selecting required capabilities and leveraging template-based workflows, allowing for rapid, consistent configuration of system resources. Natively built on a REST API, VOS Cloud-Native Software offers seamless integration into existing operations, simplifying operators' ability to add services to their workflow — or remove them — in a matter of minutes.

[LEARN MORE](#)

Business benefits

Maximum scalability VOS Cloud-Native Software supports private cloud deployment as well as bare metal environment. This provides infrastructure independence and lets you work the way you want.	Flexible business model VOS Cloud-Native Software's term or usage-based pricing assures that you pay only for the functions you actually use.	Accelerated time-to-market VOS Cloud-Native Software offers you unparalleled flexibility to quickly cover special events such as concerts and live sports. You can easily add a new video channel to your lineup, build out a system on one cloud and launch it on another, and load share between different cloud environments.
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Key features

- **PURE Power**

Encoding and transcoding on VOS Cloud-Native Software is performed by our PURE Compression Engine™, an advanced software-based transcoding technology that supports SD, HD and UHD formats and MPEG-2, MPEG-4 AVC and HEVC codecs. Relying on the PURE Compression Engine, your content can be distributed at dramatically reduced bitrates. This helps you save storage and CDN costs.

- **CMAF low-latency**

Relying on the common media application format (CMAF) small chunk packaging for HLS and DASH delivery of UHD content, VOS Cloud-Native Software allows you to keep end-to-end latency as low as 6 seconds for OTT delivery, compared to the industry norm of 30 to 35 seconds.

- **Input versatility**

As a full IP solution, VOS Cloud-Native Software supports all the traditional compressed formats (MPEG-2, AVC, and HEVC over IP) as well as the latest uncompressed standards (e.g. SMPTE-2022-6). In addition, you can securely contribute live 24/7 services and events to your cloud workflow using our CloudLink application.

- **Statistical multiplexing**

VOS Cloud-Native Software maximizes the efficiency and flexibility of multiplexing by integrating Harmonic's statistical encoding technologies. A target average bitrate can be set for each service within a statmux pool in order to maximize the video quality into a fixed bandwidth.

- **High-quality graphics and branding**

Adding logos, branding or feeds to your video channels is made easy with VOS Cloud-Native Software graphics capability. Included graphic elements can be shared across all distribution channels, including mobile devices and web.

VOS Cloud-Native Software capabilities

- **UHD OTT**

VOS Cloud-Native Software has been designed to manage large OTT profile encoding jobs leveraging multi-machine synchronization technology. This capability allows VOS Cloud-Native Software to deploy UHD on any kind of environment for an OTT, IPTV or traditional TV application.

- **Live streaming**

VOS Cloud-Native Software allows you to package an OTT stream on the fly with adaptive bitrate using MPEG-DASH, Microsoft® Smooth Streaming, or Apple® HLS. The built-in option for RTMP lets you publish content to online platforms directly.

- **Time-Shift TV and Cloud DVR**

By interfacing VOS Cloud-Native Software to a content management system, the CMS can define a recording window for each channel. This capability enables start-over, catch-up, long-lasting catch-up and Cloud DVR for TV shows that are currently playing, giving consumers complete control over their viewing experience.

- **Streaming video on demand**

Simply and securely contribute an existing VOD library, and use VOS Cloud-Native Software to prepare and deliver the catalog directly to OTT subscribers.

- [System components and requirements](#)
- [Accessing VOS](#)

System components and requirements

The VOS Cloud-Native Software system components work together to assist you in the day-to-day management of Broadcast and OTT media preparation, monitoring, and delivery.

The VOS Cloud-Native Software system comprises the following components:

- The VOS Cloud-Native Software application.
- The compute, networking and storage infrastructure (provided, managed and operated by the customer¹).
- One or more CloudLink instances, if delivery of media content, to and from a cloud, is required.

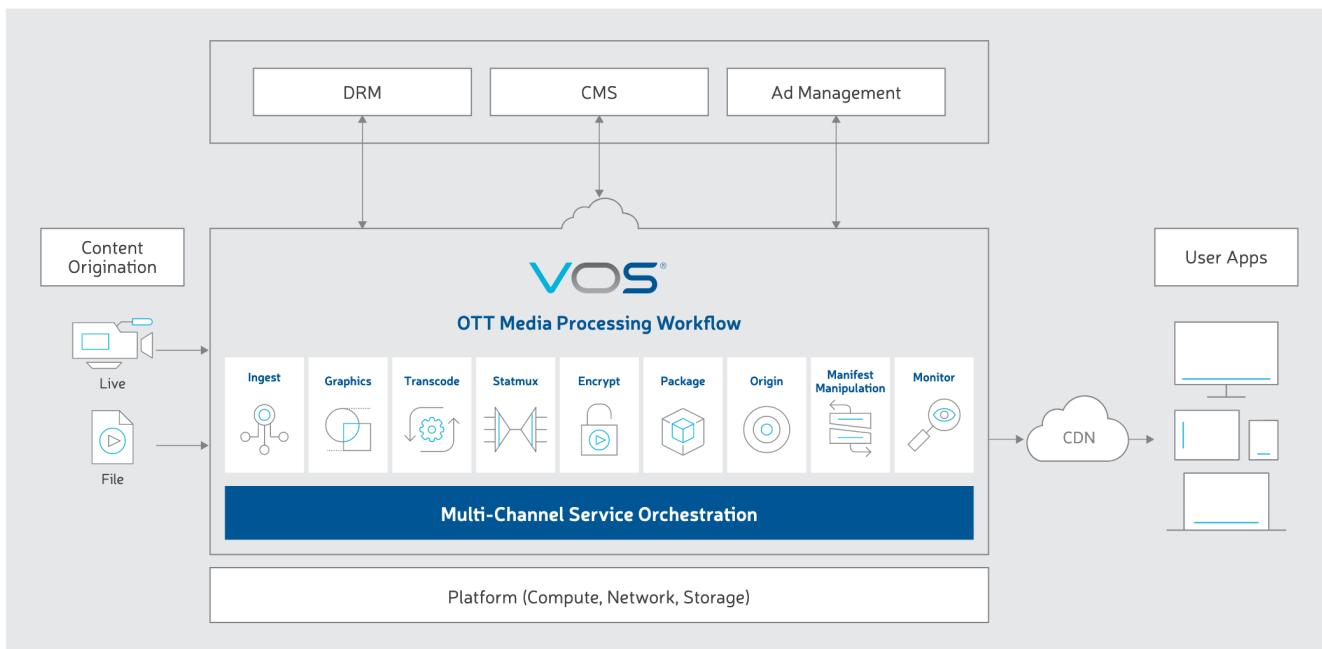
- The Harmonic Hub, a cloud-based SaaS that serves as the online administration console for connecting with Harmonic support, performing software downloads and automatic backups, configuring profiles and user rights, administrating account preferences, retrieving usage data, etc.

The VOS Cloud-Native Software application architecture consists of the following:

- A Linux Operating System¹
- An optional Virtualization/hypervisor layer¹
- The VOS applications

¹ Harmonic can provide recommendations for COTS server compute infrastructure for bare-metal deployment scenarios.

System components



- System infrastructure
- VOS applications
- VOS redundancy
- Harmonic Hub

System infrastructure

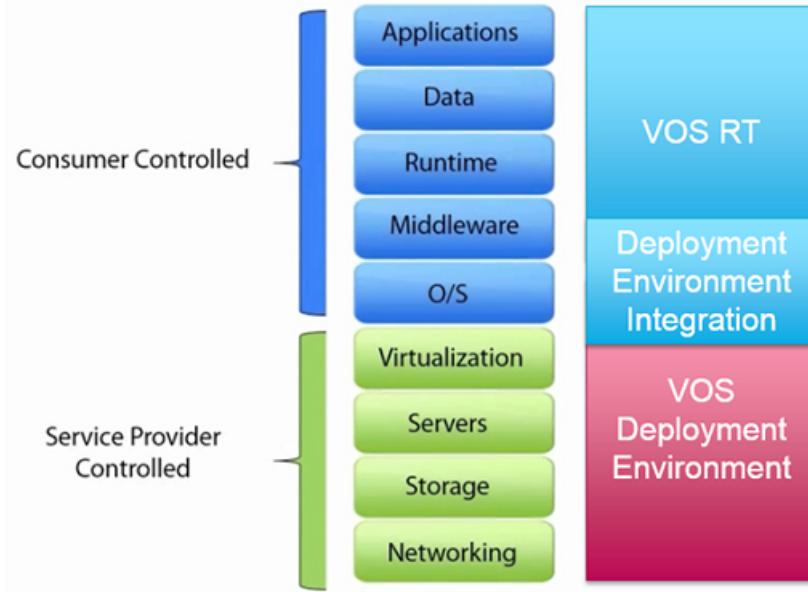
VOS Cloud-Native Software infrastructure provides microservices and middleware components that support high resource availability, smooth upgrades, and scalability.

Middleware components consist of the following:

- Docker
- Zookeeper
- Kubernetes (or Mesos)

- Marathon
- Kibana

System architecture



- Node types
- Identifying the host name

Node types

A VOS Cloud-Native Software has ingest, egress, and controller nodes. It can be configured with or without a dedicated controller node.

Without a dedicated controller

Each node has the role of controller, live-ingest, or egress. A full set of software/middleware is installed to each node.

With a dedicated controller

The quantity of controller nodes is specified during deployment. These nodes contain full set of software/middleware. The remaining nodes contain the datapath only, and are dedicated ingest/egress nodes.

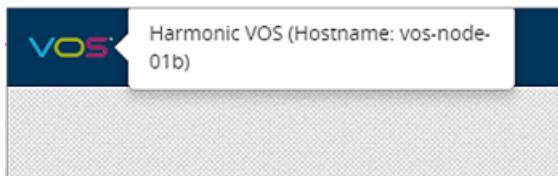
Note that controller nodes can be deployed on a different instance type than that which is used for ingest and egress nodes (for cost savings).

Identifying the host name

You can find the host name from any VOS app.

- From any VOS app, point to the VOS logo in the top left corner.

Result: The host name displays as hover text.



VOS applications

Apps are specialized and limited in scope, but when combined, are a cloud-based software solution for broadcast and multiscreen media preparation and delivery.

User roles determine which apps the user may access. When you navigate to different apps, note that VOS can take just a few moments to gather and display data.

You can find important app information, such as version, release date, and release notes, in the footer. Type an asterisk * in the **App Navigator** search field to display all available app pages.

VOS apps description

App	Description
Asset Acquisition	Manually upload video assets to VOS Cloud-Native Software.
Configure Broadcast	Use the Configure Broadcast app to configure output programs/components for the mux service.
Configure Channels	Create, manage, and delete sources, destinations, and services.
Developer Portal	Access VOS development and testing tools.
DevOps Portal	Access VOS middleware components.
Lab Wizard	Manage and modify service and destination profiles.
Logs	Access, filter, and download the VOS system log.
Monitor Channels	View source settings and monitor service performance.
Notifications	Manage and monitor system events that require user intervention.

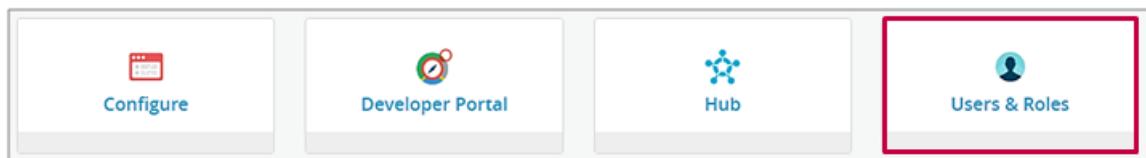
App	Description
Origin	Monitor Origin server performance and access the Origin server log.
Public API	Access VOS REST APIs.
Scrambling	Manage Conditional Access Systems and Digital Rights Management.
System	The main landing page for the VOS applications. It serves as a workspace for managing all aspects of your VOS Cloud-Native Software.
Users & Roles	Create, manage, and delete user accounts and user roles.
Versions	Backup and restore the VOS Cloud-Native Software, and validate service profiles.

- [Dynamic app ordering](#)
- [Changing the default app](#)

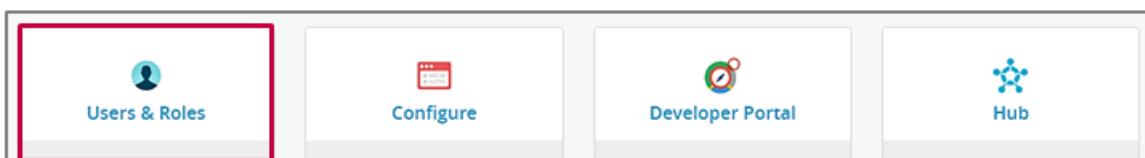
Dynamic app ordering

The arrangement of apps changes based on the apps you use most frequently in a particular session.

When you log out and log in again, the app panel reverts to the default view.



App panel arrangement before accessing the Users & Roles app



App panel arrangement after accessing the Users & Roles app

Changing the default app

After logging in to VOS, the System app displays by default. You can select a different default app from the user profile settings.

1. From any page in System app, click the **User profile** drop-down arrow, then click your username.
2. From the **Default app** drop-down list, select a new starting app and then click **Save**.

VOS redundancy

VOS Cloud-Native Software provides multiple points of redundancy to ensure maximum service uptime.

What are trying to protect against?

- Physical Failures
 - Network, switch, ports, cables
 - Servers, power, storage etc.
 - Data-center compete outage
- Compute cluster/infrastructure
 - K8s or OS glitches
- VOS SW Failures
 - Video path, SSPEA, LIO, MDS
 - Control Path

VOS has redundancy options for System-Level and for Cluster-Level

- **System-level options**
 - 1+1 geo-redundancy
 - Synchronization mechanism between 2 VOS runtimes to generate synchronous service output and allow seamless switching between both services
 - Can be enabled/disabled per service (e.g. premium services only)
 - Applies to encoding + packaging, or encoding only
 - Source redundancy is supported (Same source used by both runtimes.)
 - ESAM (In-Band and Out-Of-Band) supported simultaneously for 1+1 geo-redundancy with TS input
 - Maximum latency between source reception of both cluster is 300ms
 - For encoding:
 - The sources can be TS (local multicast or SRT) or 2022-6 (local multicast, Up to HD, 25/50fps, VITC mandatory)
 - Encoding output muted in case of missing source on slave service (no slate insertion)
 - For packaging:
 - Supported for HLS, DASH and HSS live pull packaging
 - Supported for HLS and HSS live push packaging
 - Supported for Start-Over/Catch-Up (HLS/DASH/HSS), single cloud deployments only
 - Supported for SCTE-35 segmentation & DAI annotation for HLS and DASH output
 - Automatic selection and delivery of the most complete redundant live playlist/manifest
 - Synchronized internal HLS key generation for native HLS content protection (AES / Sample-AES)

- Service redundancy
 - Hot - Hot (1:1): When redundancy is turned ON for a service, VOS will stage two copies of the same service, in two different availability zones inside the VOS cluster. Availability zone redundancy available for 1:1 transcoding and 1:1 Mux services.
 - Best effort: VOS will try to re-establish the services on residual resources on available VOS nodes even when redundancy is turned OFF.
- Source redundancy
 - Compressed sources
 - Multiple IP sources (from same or different IP interfaces)
 - Slate insertion for signal loss, include unhealthy source
 - SMPTE 2022-6 sources
 - Input redundancy: Using 2022-7 active-active receive. The two input are exactly the same.
 - Source redundancy: The two input can be different, but the primary source will be the main configuration to define the output. By definition, the two sources can have different source grooming so they can be different video, audio, and data.
- Statmux redundancy
 - 1:1 pool redundancy in VOS Cloud-Native Software
- Multi bitrate TS input redundancy
 - Up to 2 sources supported per service:
 - Based on socket redundancy, assuming same properties for both sources (same profiles, same list of components with same PIDs)
 - Both sources are received at the same time, only one is used for packaging
 - Both sources can be received on the same or different physical ports, multicast IP addresses and ports can be different, but the profiles must be in the same order (i.e. order of the ports)
 - Full switch from one MBTS source to the second one (no partial failover, i.e. all profiles come from one single source)
 - Automatic / Manual
 - Automatic: Active source is unhealthy and backup source is healthy (no automatic switch back to primary source)
 - Manual mode: Forced by operator
 - Switching conditions:
 - Signal loss
- VOS nodes redundancy
 - Automatic load balancing and redundancy of the VOS processing nodes
- **Cluster-Level options**
 - Sizing clusters by including over-capacity nodes to accommodate compute node failures
 - Over capacity nodes pre-configured for a specific node role, ingest or egress – to lower service recovery time
 - Provisioning redundant services
 - SSPEA, LIO, MDS, VOS HA

Examples of how VOS handles failure cases -

Failure	Mitigation Strategy
Source Failure	Source redundancy
Server Failure	Redundant services Over capacity
Data Center outage	Redundant VOS clusters
VOS Component Failure	Redundant services Over capacity
Data fail due to control path fail	Data path and control path separation VOS HA redundancy

- [IPTV and OTT service redundancy](#)
- [1+1 geo-redundancy \(VOS Origin\)](#)

IPTV and OTT service redundancy

VOS supports both source redundancy and service-level redundancy.

Source redundancy

Two sources are assigned to a single service. The sources do not have to be identical. For example, the sources may have different packet identifiers (PIDs) or they may use different codecs. If the primary source fails due to, for example, signal loss, excessive Continuity Count (CC) errors, or missing processing PIDs, then the service switches to the alternate source.

When the primary source recovers, the system does not automatically return to that source. Also, source priorities do not change as the result of a failover. The primary source remains configured as the primary source.

With an alternate input source configured, you can manually switch between sources using the Monitor Channels app.

Service-level redundancy

Two identical stream processing or packaging tasks are created for a service. Each task is placed in a different availability zone. If the primary task fails, VOS switches to the backup task. If Redundancy Mode is enabled, failover time is typically less than one second.

Destination Type	Output	Support Service Redundancy?
Broadcast	IP	✓
Broadcast	CloudLink	✓
Broadcast	Zixi	✓
Broadcast	HSP	✓
Origin/CDN	Multiscreen/OTT (HLS)	✓
	Multiscreen/OTT (DASH)	✓
ATS	IP	✓
ATS	CloudLink	✓
ATS	HSP	✓

Related information

[Identifying redundant streams in Mesos](#)

[Manually switching input sources](#)

1+1 geo-redundancy (VOS Origin)

In the event of a site failure, 1+1 geo-redundancy ensures uninterrupted media delivery by allowing CDNs to retrieve services from a paired, synchronized VOS Origin server in a different geographic location.

1+1 geo-redundancy is supported for OTT pull-packaging only. The supported formats are HLS, DASH and MSS.

About geo-redundancy

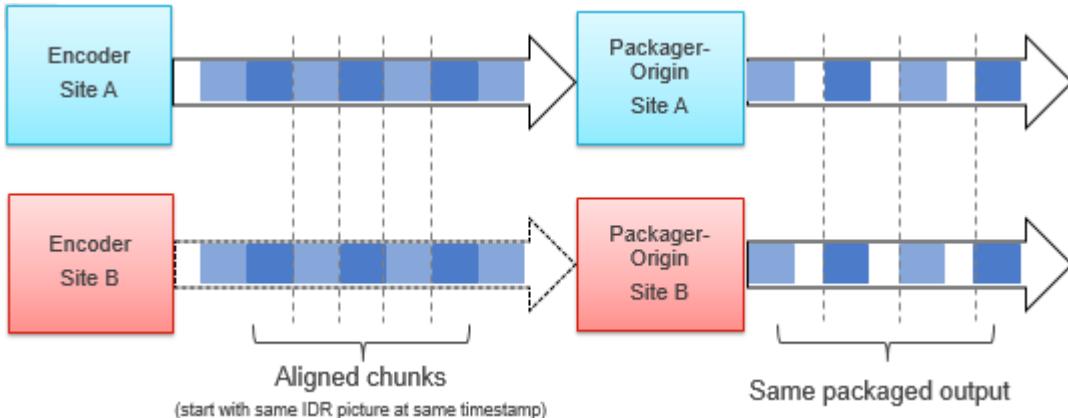
Two paired VOS Cloud-Native Software instances at different sites must have identical services. The first activated service becomes the master. When the service with the same name and configuration is activated on the second instance, it becomes the slave. Once the slave synchronizes with the master, it begins to publish output. Package output status is synchronized every 5 seconds to detect mismatches.

Master-slave synchronization is established at the service level. This means that VOS Cloud-Native Software 1 can be master for Service A, while VOS Cloud-Native Software 2 can be master for Service B.

⚠ Note

Harmonic recommends using separate load balancers within each VOS Cloud-Native Software that will be paired.

Synchronized encoder feeds and packaging



Requirements

1+1 geo-redundancy has the following requirements:

- Both VOS Cloud-Native Software instances must use the same NTP server.
- Services on both VOS Cloud-Native Software instances must be identical:
 - Same name
 - Same source configuration
 - Same destination profile (destination profiles are automatically provisioned and synchronized in the Harmonic Hub)
 - Same Service ID
- If source redundancy is enabled (a primary and backup source are configured for the same channel), then the sources must have the same rank on both VOS Cloud-Native Software instances.

Error handling

The system response depends on the type of error:

- Master service failure: The slave service becomes the master. After failover, the former master will be restarted as slave.
- Source synchronization failure: The slave will not publish until sources are re-synchronized.
- Source error: The master determines which is the stable source and switches accordingly. The slave follows.
- VOS Cloud-Native Software loss of connection:
 - Both VOS Cloud-Native Software instances become the master and use only local sources.
 - When connection is re-established, the double-master status will be detected and master-slave status will be restored.

Related information

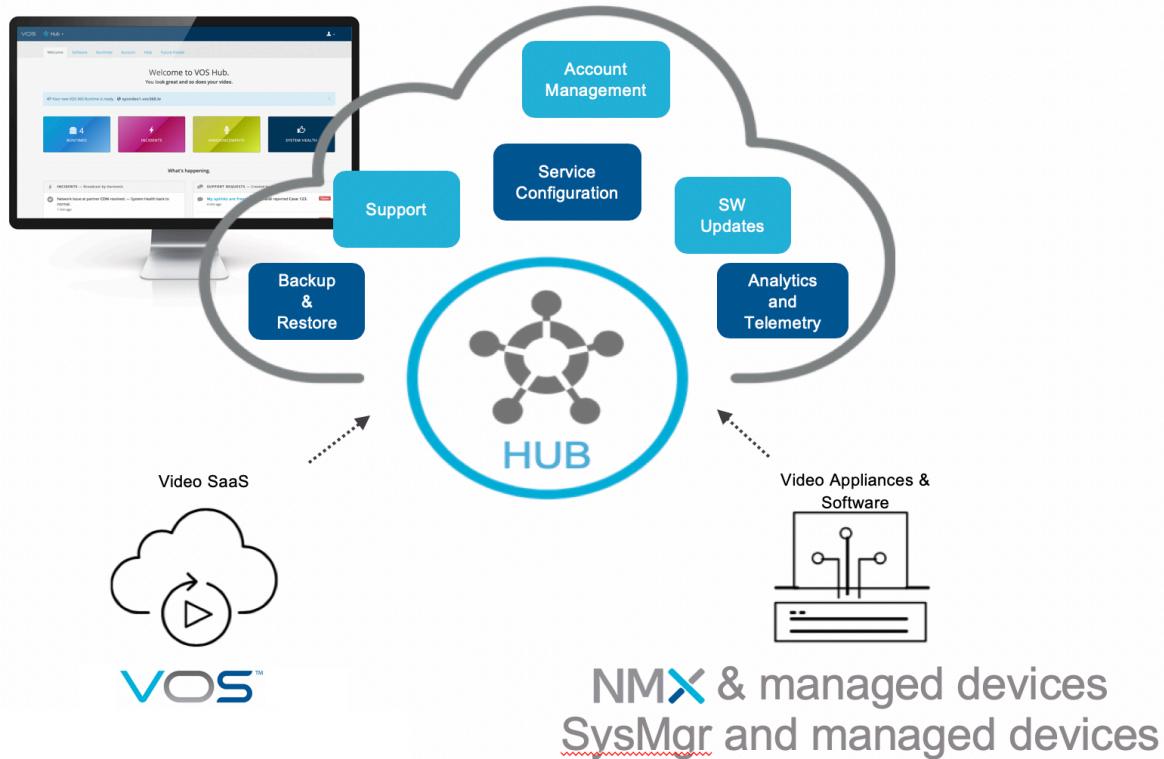
[Configuring identical services for geo-redundancy](#)

Harmonic Hub

Harmonic Hub is the online administration console for all your connected Harmonic products and services.

- Manage a wide range of aspects including user IDs, transcoding profiles, software downloads and daily backups.
- Start a new conversion to receive support and benefit from our expertise.
- Enhance operational efficiency through the online dashboards and reporting systems.
- Connect your other Harmonic products, to reduce troubleshooting time and increase your service uptime.

Hub connected systems



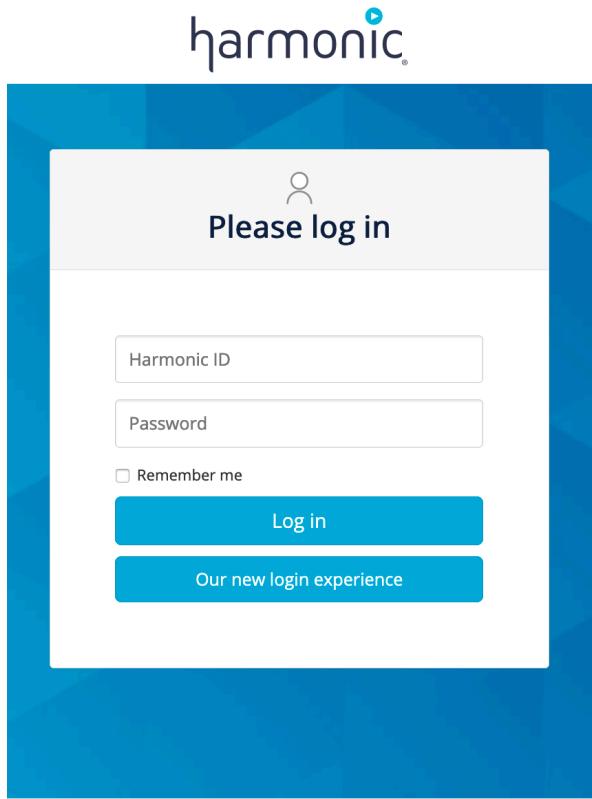
The Harmonic Hub can be reached at <https://hub.harmonicinc.com>:

- As an online SaaS it is operated and maintained by Harmonic.
- Connectivity to Hub is essential for performing some VOS Cloud-Native Software operations such as creating and managing Harmonic IDs, backing up systems, downloading software, authenticating to the cluster, etc.

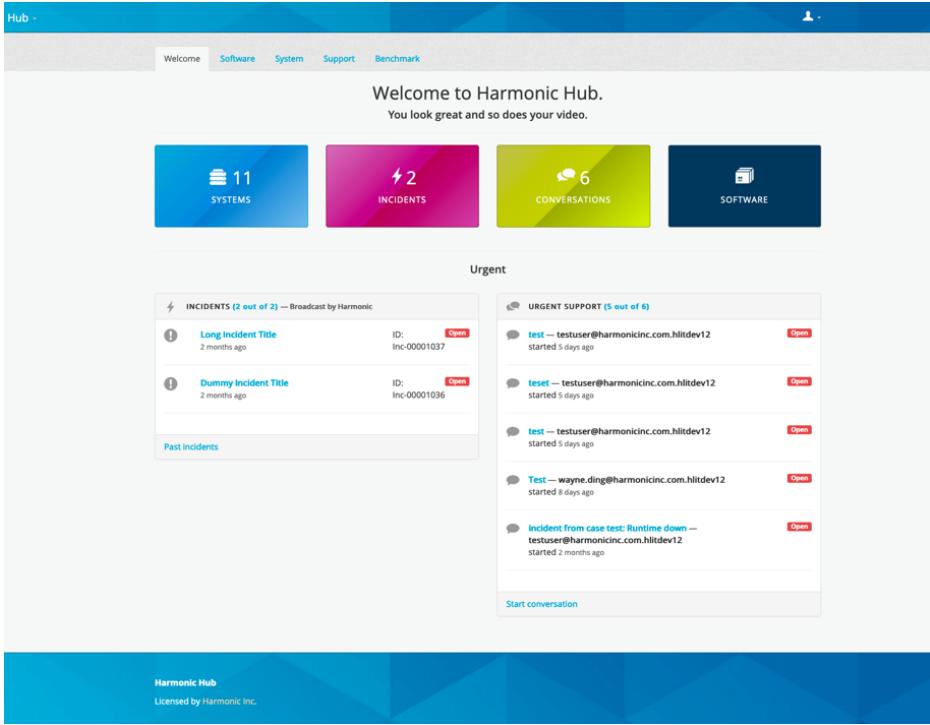
Note

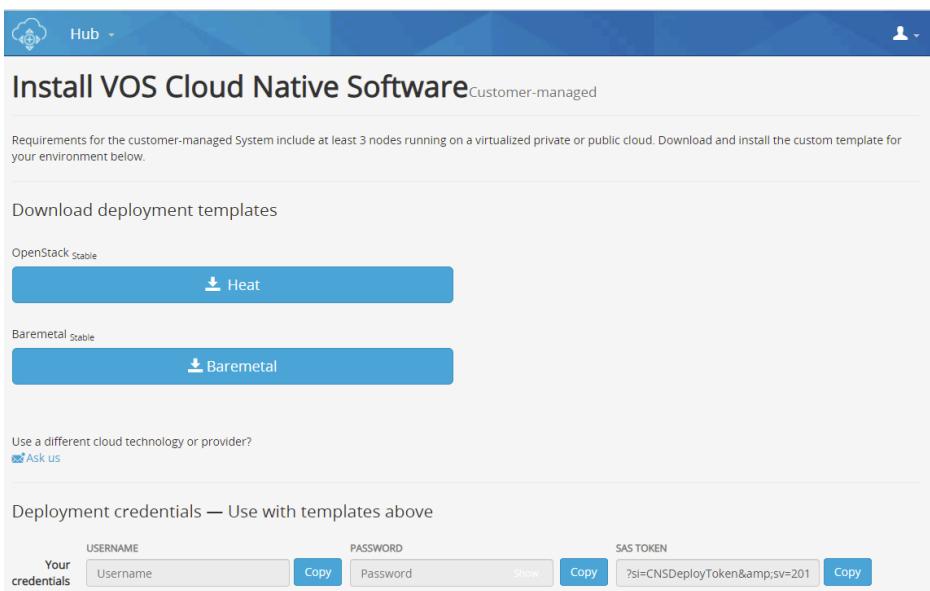
A public internet connection is required for communication between the client PC and the Harmonic Hub, and between the VOS Cloud-Native Software and Harmonic Hub.

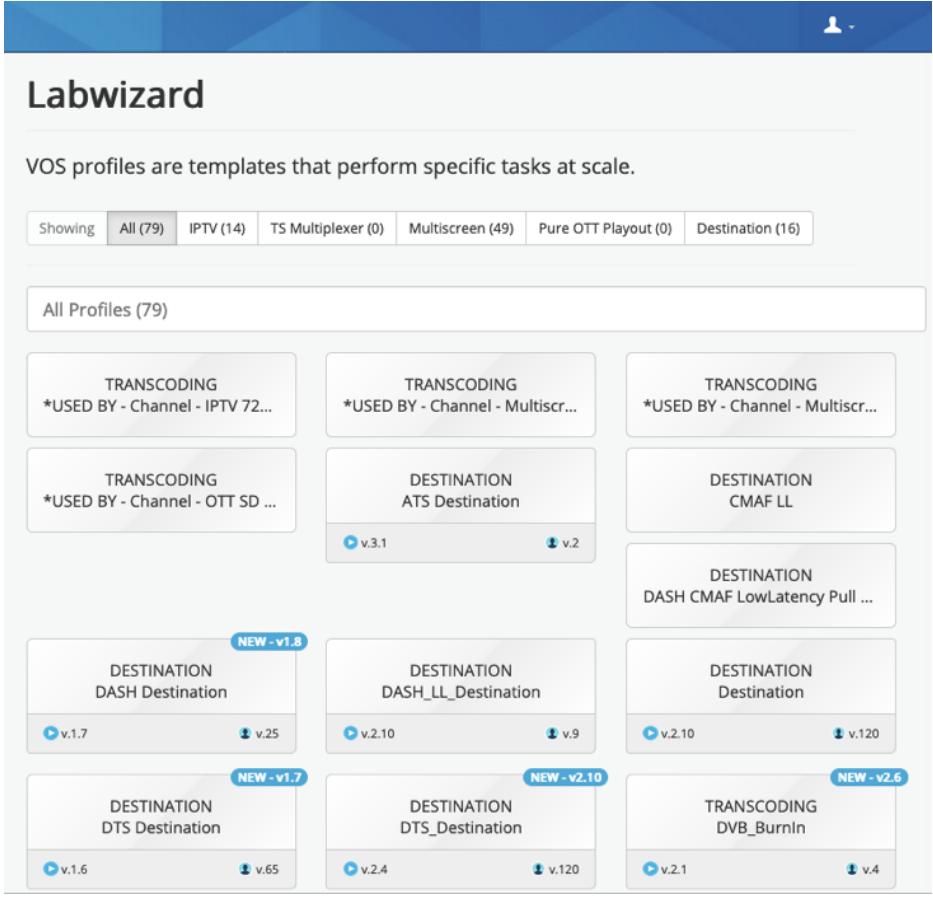
Hub login page

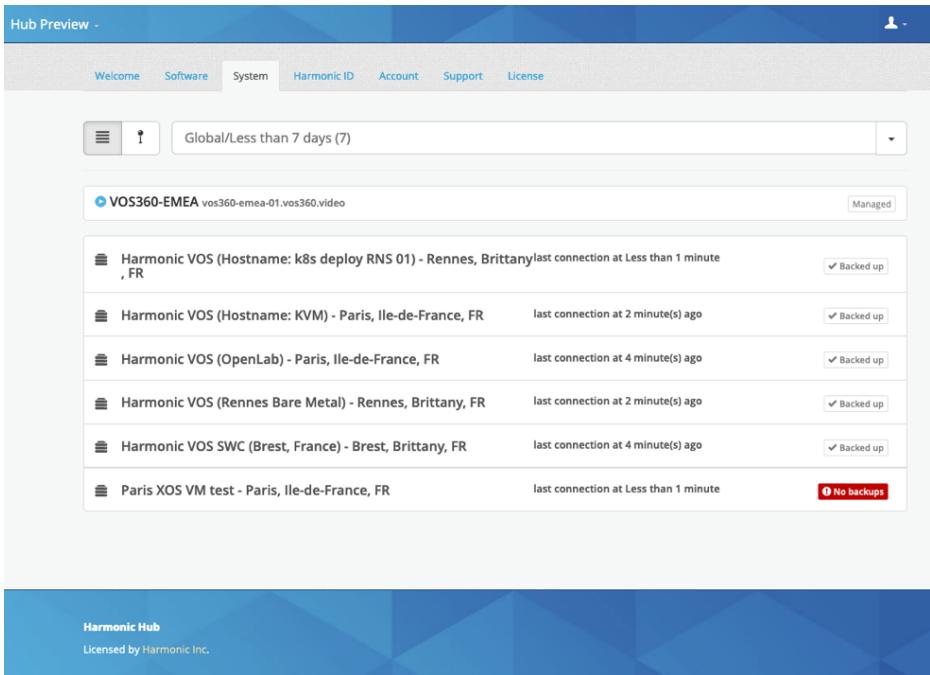


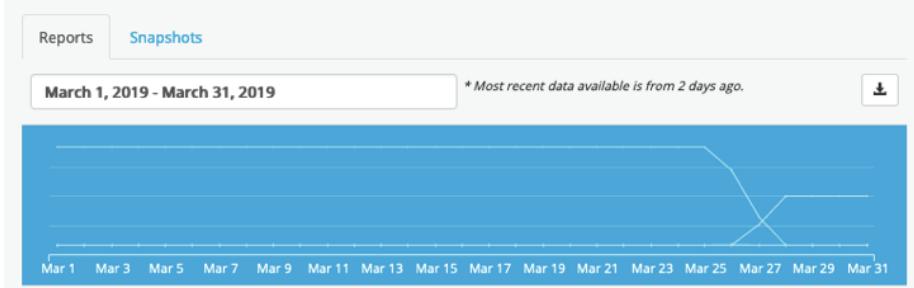
Key features of Harmonic Hub

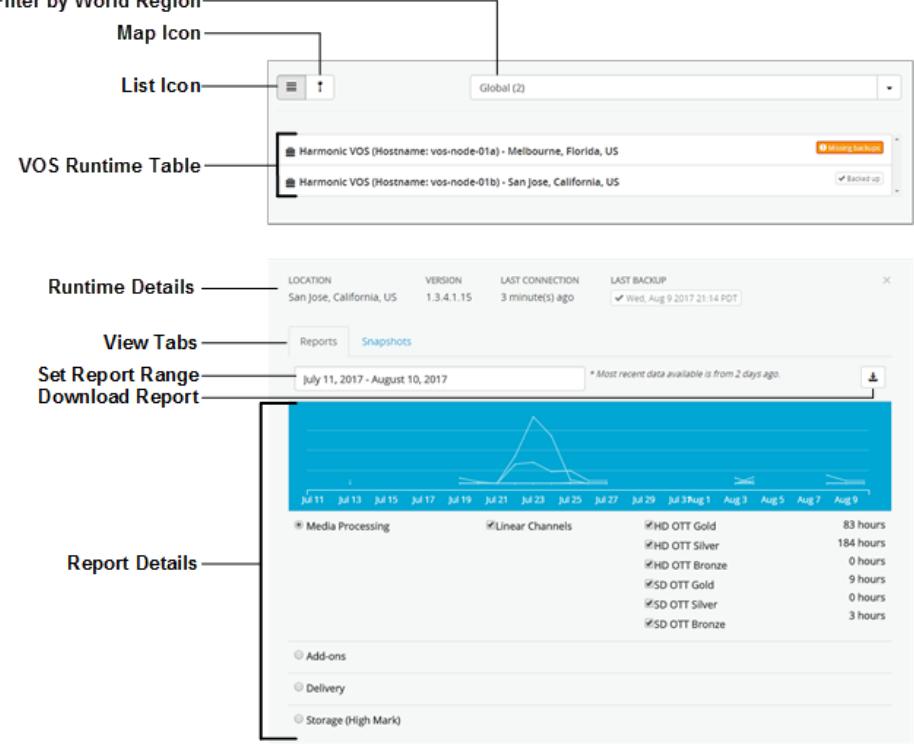
Function	Description
Welcome tab	<p>The Summary page with dashboard of systems, incidents and support conversations.</p>  <p>An "Incident" is a broadcast message from Harmonic to one or more customers regarding an incident, typically a Harmonic-side service disruption.</p>
Software tab	

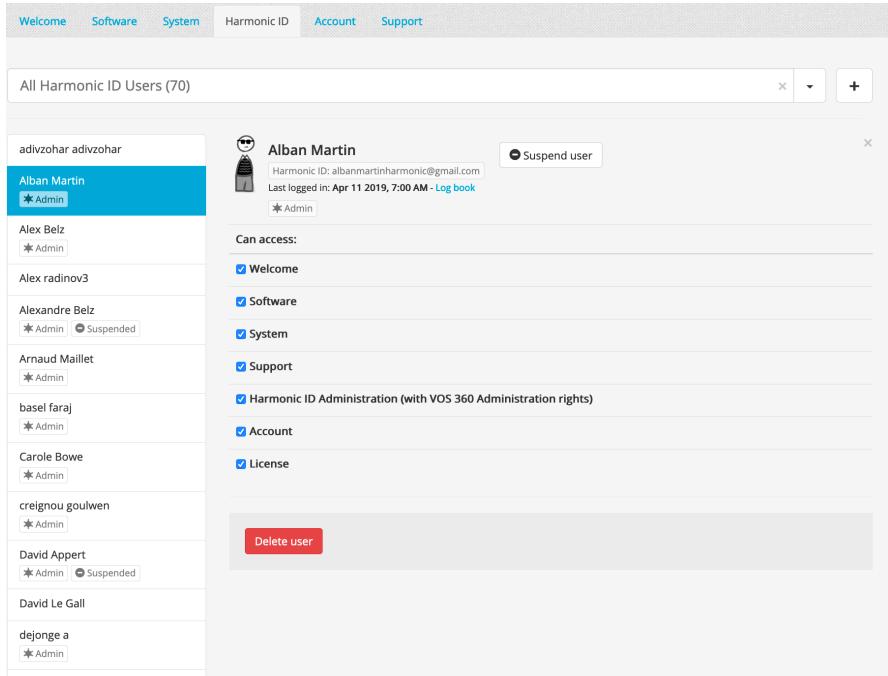
Function	Description
	<p>VOS Cloud-Native Software installation</p>  <p>The screenshot shows the 'Install VOS Cloud Native Software' page. It features two main download buttons: 'Heat' (under OpenStack Stable) and 'Baremetal' (under Baremetal Stable). Below these buttons, there's a link to 'Ask us' if using a different cloud technology or provider. At the bottom, there's a section for 'Deployment credentials' with fields for 'USERNAME' (labeled 'Your credentials'), 'PASSWORD', and 'SAS TOKEN', each with a 'Copy' button.</p>

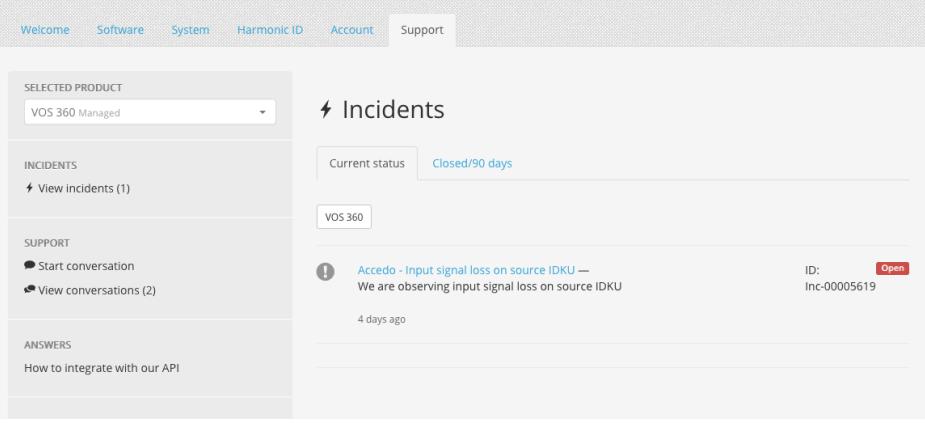
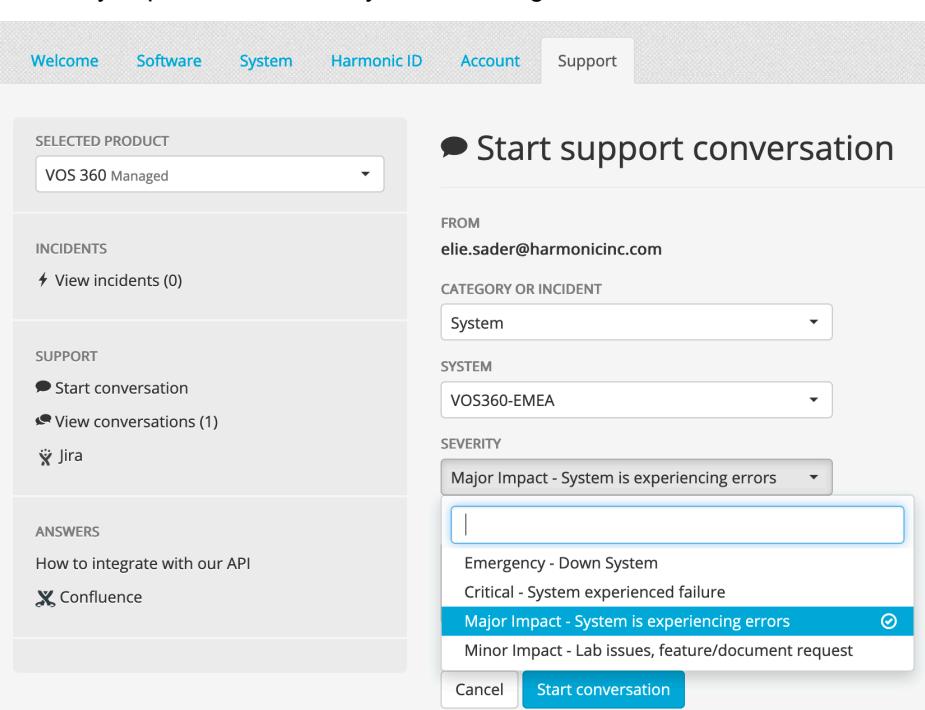
Function	Description
	<p>LabWizard can also be exposed in the Hub upon request.</p>  <p>The screenshot shows the Labwizard interface with the following details:</p> <ul style="list-style-type: none"> Header: Shows a user icon and a dropdown menu. Title: Labwizard SubTitle: VOS profiles are templates that perform specific tasks at scale. Filter Bar: Showing All (79) IPTV (14) TS Multiplexer (0) Multiscreen (49) Pure OTT Playout (0) Destination (16) Section Header: All Profiles (79) Profile Cards: A grid of 12 cards representing different profiles, each with a status badge (e.g., NEW - v1.8, NEW - v2.10, NEW - v2.6), version numbers (e.g., v.1.7, v.25, v.210, v.9, v.120, v.65, v.2.4, v.120, v.2.1, v.4), and descriptions.

Function	Description																																
System tab	<p>A list of systems that is registered to the Hub account.</p> <p>For example, VOS Cloud-Native Software, VOS360 and NMX etc...</p>  <p>The screenshot shows the 'Hub Preview' interface with the 'System' tab selected. A search bar at the top right contains the query 'Global/Less than 7 days (7)'. Below the search bar is a table listing seven systems:</p> <table border="1"> <thead> <tr> <th>System Name</th> <th>Location</th> <th>Last Connection</th> <th>Backup Status</th> </tr> </thead> <tbody> <tr> <td>VOS360-EMEA</td> <td>vos360-emea-01.vos360.video</td> <td>Less than 1 minute</td> <td>Managed</td> </tr> <tr> <td>Harmonic VOS (Hostname: k8s deploy RNS 01)</td> <td>Rennes, Brittany, FR</td> <td>Less than 1 minute</td> <td>Backed up</td> </tr> <tr> <td>Harmonic VOS (Hostname: KVM)</td> <td>Paris, Ile-de-France, FR</td> <td>2 minutes ago</td> <td>Backed up</td> </tr> <tr> <td>Harmonic VOS (OpenLab)</td> <td>Paris, Ile-de-France, FR</td> <td>4 minutes ago</td> <td>Backed up</td> </tr> <tr> <td>Harmonic VOS (Rennes Bare Metal)</td> <td>Rennes, Brittany, FR</td> <td>2 minutes ago</td> <td>Backed up</td> </tr> <tr> <td>Harmonic VOS SWC (Brest, France)</td> <td>Brest, Brittany, FR</td> <td>4 minutes ago</td> <td>Backed up</td> </tr> <tr> <td>Paris XOS VM test</td> <td>Paris, Ile-de-France, FR</td> <td>Less than 1 minute</td> <td>No backups</td> </tr> </tbody> </table> <p>At the bottom of the interface, it says 'Harmonic Hub' and 'Licensed by Harmonic Inc.'</p>	System Name	Location	Last Connection	Backup Status	VOS360-EMEA	vos360-emea-01.vos360.video	Less than 1 minute	Managed	Harmonic VOS (Hostname: k8s deploy RNS 01)	Rennes, Brittany, FR	Less than 1 minute	Backed up	Harmonic VOS (Hostname: KVM)	Paris, Ile-de-France, FR	2 minutes ago	Backed up	Harmonic VOS (OpenLab)	Paris, Ile-de-France, FR	4 minutes ago	Backed up	Harmonic VOS (Rennes Bare Metal)	Rennes, Brittany, FR	2 minutes ago	Backed up	Harmonic VOS SWC (Brest, France)	Brest, Brittany, FR	4 minutes ago	Backed up	Paris XOS VM test	Paris, Ile-de-France, FR	Less than 1 minute	No backups
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Function	Description																																				
	<p>The usage reports are exposed when clicking on the particular system.</p>  <p>Media Processing</p> <table border="1"> <tbody> <tr> <td><input checked="" type="radio"/> Encoding & Transcoding</td> <td><input checked="" type="checkbox"/> Premium Live (Broadcast or OTT)</td> <td><input checked="" type="checkbox"/> UHD Plus — hours</td> </tr> <tr> <td></td> <td><input checked="" type="checkbox"/> HD Plus — hours</td> <td><input checked="" type="checkbox"/> SD Plus 0 hours</td> </tr> <tr> <td></td> <td><input checked="" type="checkbox"/> Standard Live (OTT only)</td> <td><input checked="" type="checkbox"/> HD OTT 106 hours</td> </tr> <tr> <td></td> <td></td> <td><input checked="" type="checkbox"/> SD OTT 1,251 hours</td> </tr> <tr> <td></td> <td><input checked="" type="checkbox"/> Premium File</td> <td><input checked="" type="checkbox"/> UHD Plus — hours</td> </tr> <tr> <td></td> <td></td> <td><input checked="" type="checkbox"/> HD Plus 0 hours</td> </tr> <tr> <td></td> <td></td> <td><input checked="" type="checkbox"/> SD Plus — hours</td> </tr> <tr> <td></td> <td><input checked="" type="checkbox"/> EyeQ</td> <td>— hours</td> </tr> <tr> <td><input type="radio"/> Live Add-ons</td> <td><input type="checkbox"/> Timeshift recording (from Live channels)</td> <td>743 hours</td> </tr> <tr> <td></td> <td><input type="checkbox"/> Standard Playout</td> <td>— hours</td> </tr> <tr> <td><input type="radio"/> System & Storage</td> <td>System Management (per each 20 services)</td> <td>1 license</td> </tr> <tr> <td></td> <td><input type="checkbox"/> Storage Management (high mark)</td> <td>0.02 TB</td> </tr> </tbody> </table>	<input checked="" type="radio"/> Encoding & Transcoding	<input checked="" type="checkbox"/> Premium Live (Broadcast or OTT)	<input checked="" type="checkbox"/> UHD Plus — hours		<input checked="" type="checkbox"/> HD Plus — hours	<input checked="" type="checkbox"/> SD Plus 0 hours		<input checked="" type="checkbox"/> Standard Live (OTT only)	<input checked="" type="checkbox"/> HD OTT 106 hours			<input checked="" type="checkbox"/> SD OTT 1,251 hours		<input checked="" type="checkbox"/> Premium File	<input checked="" type="checkbox"/> UHD Plus — hours			<input checked="" type="checkbox"/> HD Plus 0 hours			<input checked="" type="checkbox"/> SD Plus — hours		<input checked="" type="checkbox"/> EyeQ	— hours	<input type="radio"/> Live Add-ons	<input type="checkbox"/> Timeshift recording (from Live channels)	743 hours		<input type="checkbox"/> Standard Playout	— hours	<input type="radio"/> System & Storage	System Management (per each 20 services)	1 license		<input type="checkbox"/> Storage Management (high mark)	0.02 TB
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Function	Description																											
	 <p>The screenshot shows the VOS interface. At the top, there's a 'Filter by World Region' section with a 'Map Icon' and a 'List Icon'. Below it is the 'VOS Runtime Table' which lists two hosts: 'Harmonic VOS (Hostname: vos-node-01a) - Melbourne, Florida, US' and 'Harmonic VOS (Hostname: vos-node-01b) - San Jose, California, US'. The 'Harmonic VOS (Hostname: vos-node-01b)' row has a 'Missing backup' status and a 'Backed up' checkbox. Underneath the table is the 'Runtime Details' section, which includes the location 'San Jose, California, US', version '1.3.4.1.15', last connection '3 minute(s) ago', and last backup 'Wed, Aug 9 2017 21:14 PDT'. Below that is the 'View Tabs' section with 'Reports' and 'Snapshots' tabs. The 'Reports' tab is selected, showing a report range from 'July 11, 2017 - August 10, 2017' and a note that 'Most recent data available is from 2 days ago'. A download button is also present. The 'Report Details' section contains a chart and a table of data. The chart shows a peak around July 23rd. The table lists various service types and their status:</p> <table border="1"> <thead> <tr> <th>Service Type</th> <th>Status</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>Media Processing</td> <td>Up</td> <td>83 hours</td> </tr> <tr> <td>Linear Channels</td> <td>Up</td> <td>184 hours</td> </tr> <tr> <td>HD OTT Gold</td> <td>Up</td> <td>0 hours</td> </tr> <tr> <td>HD OTT Silver</td> <td>Up</td> <td>9 hours</td> </tr> <tr> <td>HD OTT Bronze</td> <td>Up</td> <td>0 hours</td> </tr> <tr> <td>SD OTT Gold</td> <td>Up</td> <td>3 hours</td> </tr> <tr> <td>SD OTT Silver</td> <td>Up</td> <td>0 hours</td> </tr> <tr> <td>SD OTT Bronze</td> <td>Up</td> <td>3 hours</td> </tr> </tbody> </table> <p>Below the chart are sections for 'Add-ons', 'Delivery', and 'Storage (High Mark)'.</p>	Service Type	Status	Time	Media Processing	Up	83 hours	Linear Channels	Up	184 hours	HD OTT Gold	Up	0 hours	HD OTT Silver	Up	9 hours	HD OTT Bronze	Up	0 hours	SD OTT Gold	Up	3 hours	SD OTT Silver	Up	0 hours	SD OTT Bronze	Up	3 hours
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SD OTT Silver	Up	0 hours																										
SD OTT Bronze	Up	3 hours																										
Filter by World Region	Select a world region to display only the VOS hosts in that particular region.																											
Map Icon	Click to display a world map showing all VOS locations.																											
List Icon	Click to switch back to default VOS page view.																											
VOS table	Lists all nodes with VOS hosts and their current wellness status. Click a host to display details, reports, and snapshots for that VOS.																											
VOS details	Shows node information, any error alerts and history information with a timestamp.																											

Function	Description	
	View tabs	Click a tab to change the view; Reports or Snapshots .
	Set Report Range	Click to change the date range before generating a report.
	Download Report	Click to download a .csv report file.
	Report Details	Includes a graphical and tabular summary of the generated report; click a radio button to view its relevant information.
Harmonic ID tab	<p>The Management tab for Harmonic IDs:</p> <ul style="list-style-type: none"> • View list • Add/remove/suspend (requires admin rights) • Ability to choose if a particular Harmonic ID can have access to any tab, or not. Including Welcome, Software, System and Support tabs. (new)  <p>The screenshot shows the 'Harmonic ID' tab selected in a navigation bar. Below it, a table lists 'All Harmonic ID Users (70)'. One user, 'Alban Martin', is highlighted in blue. The right side of the screen displays the details for 'Alban Martin', including his Harmonic ID, last log-in date, and access privileges. A red 'Delete user' button is visible at the bottom.</p>	

Function	Description
Support tab	<p>Select product and Start Support Conversation feature.</p>  <ul style="list-style-type: none"> Ability to provide the severity when starting the conversation
	 <p>The VOS Support Conversations tab provides visibility on latest updates for each active Slack channel.</p> <p>View Incidents: current and closed.</p> <p>The shows the Incident update history on Hub.</p>

Function	Description
	For customers with JIRA/Confluence space for shared collaboration with Harmonic, the navigation to those Confluence/JIRA space is exposed directly via the Hub support tab.
License tab	<p>This is an optional tab.</p> <p>Support VOS registration with license key.</p>

Accessing VOS

Log in to VOS using your OKTA SSO or Harmonic ID.

To log in with your Harmonic ID, the client PC requires connectivity to the Harmonic Hub via a public internet connection.

Chrome is the recommended web browser for accessing VOS applications and the Harmonic Hub.

Before you begin

If you are logging in with a Harmonic ID, first follow the instructions in the Welcome email to reset your password.

1. In a web browser, type the URL of your VOS Cloud-Native Software and press **Enter**.

Example: <https://52.36.11.33>

2. Select one of the following options:

- To log in with your Harmonic ID, enter your Harmonic ID username and password and then click **Log in**.
- To login with your Okta ID, click **Log in with Okta**, enter your username and password, and then click **Sign in**

Result: The VOS System app displays.

If a secondary identity provider is configured, you may log in using your SSO credentials.

If you are logging in via a secondary identity provider, Refer to [SAML IdP Federation Integration](#) for more information.

- Resetting or changing your Harmonic ID password
- VOS credentials cache
- Single sign-on via identity provider (IdP) federation

Resetting or changing your Harmonic ID password

After initially changing your password, you can change or reset your Harmonic ID again by entering an incorrect password on the VOS log in page.

You can only reset or change your password by using the **Can't Login** button on the **Please log in** dialog box.

1. Launch a web browser.

 **Info**

Chrome is recommended.

2. In the **URL Address** field, type the URL of your VOS Cloud-Native Software and press **Enter**.
3. On the **Please Log In** dialog box, enter your Harmonic ID, with an incorrect password, then click **Log in**.
Result: You typed an incorrect password so that the **Can't Login** button will display.
4. Click **Can't Login**.
Result: The **Reset password** dialog box opens.
5. Verify your email address and then click **Send Email**.
6. Click **Cancel** to close the **Reset password** dialog box.
7. In the Reset Password email from Harmonic, click the link to reset your password.
8. On the **Reset password** dialog, type a new password, confirm it, then click **Reset**.
Result: You can now log in to VOS with the new password.

VOS credentials cache

Credentials are cached for six hours after a user logs in. This can have an impact on suspending and deleting user accounts and changing user roles.

The credentials cache works in the following ways:

- If the user leaves VOS without logging off, and without ending the browser session, they can resume their previous session without logging in.
- If the user account is suspended or deleted, the user can continue to access VOS until their cached credentials expire.
- If the user tries to log in while their account is suspended and the cache has expired, the login fails. The login dialog box displays an error message stating that the account has been disabled. A Super Admin must unsuspend the account before you can log in again.
- If the user role changes after a user logs in, they can continue to use their previous user role until they log off and log in again.

⚠ Note

A public internet connection is required for user authentications, which are mediated by the Harmonic Hub. If the client PC or VOS Cloud-Native Software loses its internet connection, a user who is already logged in may continue monitoring services until the credentials cache expires.

Single sign-on via identity provider (IdP) federation

Logging in to VOS Cloud-Native Software is achieved via the Harmonic's identity provider (Okta). The same login credentials already apply to access other Harmonic-provided systems as part of our SaaS solution (for example Harmonic Hub, Slack, etc.).

In addition it is possible to federate Harmonic's identity provider and a customer's identity provider, in order to achieve the following:

- Single sign-on authentication (using your organization's credentials).
- Employee life-cycle management (for example, there is no need to deactivate the employee's Harmonic ID in the Harmonic Hub after termination).

Federation can be achieved via SAML 2.0 protocol:

- Okta has been verified to function and Harmonic can provide configuration steps to establish the trust and authorize the Hub and VOS.
- Other cloud-native environments SAML 2.0 capable IdPs can be integrated (contact Harmonic technical support for details).
- On-premise Microsoft ADFS is not supported directly, instead the on-premise ADFS should be integrated with a customer-provided Okta (or Microsoft Azure Active Directory or similar). The latter can be federated with Harmonic's Okta IdP.

⚠ Note

Users are added in the IdP interface and then imported into VOS Cloud-Native Software. By default, new users are assigned the role of Operator.

Harmonic can provide instructions for integration of a customer-provided Okta Identity Provider (IdP) and Harmonic's Okta IdP.

If you are using a different identity provider, contact Harmonic technical support for more details and assistance.

Related information

[SAML IdP Federation Integration](#)

VOS system pre-configuration

Once you have finished deploying the custom template for your environment, you may register CloudLink instances, pair Origin servers, and register client applications.

- Registering an OAuth client application
- Pairing Origin servers for 1+1 geo-redundancy
- Setting remote support access
- Setting the billing PO for invoicing

Registering an OAuth client application

Register an application to generate a key for third-party access to the VOS Cloud-Native Software. Authorization Code and Client Credentials grant types are supported.

Note

Only super admins have permission to register OAuth applications.

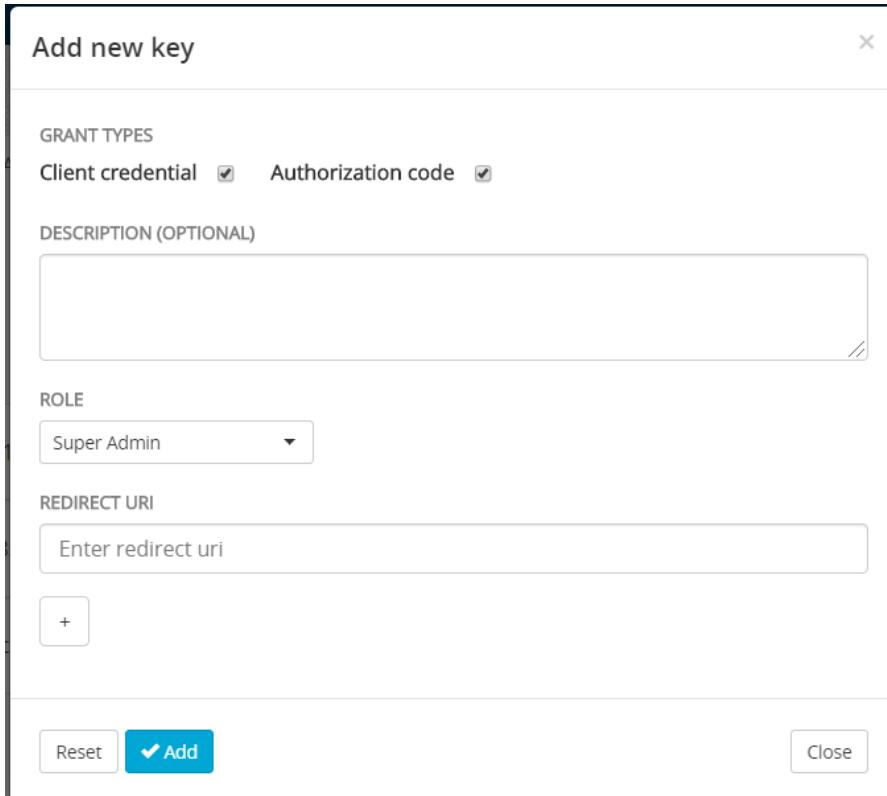
1. From the System app, click **Settings**.
2. Select the **Client Apps** tab, and then click **+Add client** to open the **Add new key** dialog.

CLIENT ID	CLIENT SECRET	CREATED BY	DESCRIPTION	GRANT TYPE	REDIRECT URI	ACTION
90b21caf-	Ryan L		Client credential		<button>Edit</button>
2c314c88-	Ryan L		Client credential		<button>Edit</button>
aa53478f-			Authorization code		<button>Edit</button>

3. For **Grant Type**, select the method that will be used to obtain the access token:
 - **Authorization code:** Used by confidential and public clients to exchange an authorization code for an access token. After the user returns to the client via the redirect URL, the application will get the authorization code from the URL and use it to request an access token.
 - **Client credential:** Used by clients to obtain an access token outside of the context of a user. Select this option to obtain an access key that may be used for CloudLink registration.

Info

You may select both grant types. A single client secret will be generated for use in both flows.



Add new key

GRANT TYPES

Client credential Authorization code

DESCRIPTION (OPTIONAL)

ROLE

Super Admin

REDIRECT URI

Enter redirect uri

+

Reset  Add Close

4. Optionally, add a description of the OAuth client app that users will see.
5. Optionally, provide a **Redirect URI** where users will be sent after authorization.

Note

For security purposes, Harmonic recommends that you register a redirect URI. The URI must begin with "https".

If the client app will be used for CloudLink registration, you can type <https://localhost/vos-api/cloudlink/v1/> callback for the redirect URI.

6. Click **Add**.
- Result: VOS generates a **Client App ID** and **Client Secret**.

Note

For security purposes, the system does not store the **Client Secret**. Harmonic recommends that you immediately copy and store this information in a secure place.

CLIENT APP ID:	7be0c46f-
CLIENT SECRET: 

7. To copy the full client object (recommended), click **Copy**. Or, to copy only the client secret, click the button to the right of the **Client Secret** string.

 **Note**

If necessary, you may generate a new **Client Secret** for an existing application from the **Client Apps** page.

Managing users and roles

VOS Cloud-Native Software super admins can manage the user accounts and roles that are associated with a particular VOS. Each user requires a Harmonic ID.

- [Users & Roles app overview](#)
- [About user roles](#)
- [Creating a Harmonic ID in the Harmonic Hub](#)
- [Importing users from the Harmonic Hub](#)
- [Assigning a role to multiple users at once](#)
- [Creating a custom user role](#)
- [Viewing user logins and logouts](#)

Users & Roles app overview

Review the app layout and understand the function of each element in the UI.

- [Users page](#)
- [Roles page](#)

Users page

From the **Users** page, you can view usernames and their assigned roles, search for users by name, filter users by role, and import new users to this VOS Cloud-Native Software.

Users page

Filter users by role

Import users

Select a user, then assign a role.

All users (5)

Confirmed users

Assigned user role

abcabcdef	Super Admin
abcnmxvos	Super Admin
abcproddef	Super Admin
abcvosdef	Super Admin
tony yik	Super Admin

User account details page

Remove user account from VOS runtime

Suspend user account

Select a user, then assign a role.

All users (5)

Change user role

User permissions

abcabcdef	Super Admin
abcnmxvos	Super Admin
abcproddef	Super Admin
abcvosdef	Super Admin
tony yik	Super Admin

abcabcdef Harmonic ID: abcabcdef@gmail.com Last logged in:

ROLE Super Admin

Can use	+ Can also
Asset Acquisition	<input type="checkbox"/> Assets Read Only <input checked="" type="checkbox"/> Assets Read and Write <input type="checkbox"/> Jobs Read Only <input checked="" type="checkbox"/> Jobs Read and Write <input checked="" type="checkbox"/> Modify application settings

Roles page

From the **Roles** page, you can view the number of users assigned to predefined and ad hoc/custom roles, and create custom roles.

User Roles main page

The screenshot shows the 'Roles' tab selected in the navigation bar. A callout points to the 'Super Admin (5)' role, which is highlighted in blue. Below it are other default roles: Operator (0), System Engineer (0), Lab Wizard (0), and Manager (0). At the bottom right of the list is a '+ Role' button. The top of the page has a header 'Number of users with role' and a note 'Select a role, then assign users.' A 'Settings' link is in the top right corner.

User Role details pane

The screenshot shows the 'Super Admin (5)' role selected in the left sidebar. The main pane displays the role's properties: 'Super Admins Sets up the system, manages users and software upgrades. At least one user must be assigned Super Admin.' Below this is a list of apps the Super Admin can access. A 'Role' button is available to edit these properties. The left sidebar also includes sections for 'User role permissions', 'Filter users by name', and 'Remove user from role'. A callout points to the list of users under the Super Admin role, which includes abc123def, abc123mxvos, abc123prodef, abc123cosdef, and tony.yik. A bracket on the right side groups these users with the text 'All users associated with the VOS Runtime'. At the bottom are 'Reset' and 'Save' buttons.

About user roles

A user's role determines the VOS apps they may access. Five pre-defined user roles are included by default.

A user can only be assigned one role at a time. Predefined roles can be modified but cannot be deleted. Super Admins can customize a role for a user by creating an Ad hoc role.

Role	Permissions
Super Admin	Access all apps
Operator	Monitor system health and integrity, but cannot modify app settings
System Engineer	Manage and configure services, sources, and destinations
Lab Wizard	Modify, manage, and assign service and destination profiles
Manager	Monitor system health and integrity and modify app settings

- Apps access matrix

Apps access matrix

Different roles access different VOS Cloud-Native Software apps.

VOS App	App Settings	Super Admin	Manager	Lab Wizard	System Engineer	Operator
Asset Acquisition		✓	✗	✗	✓	✗
	Access to application internals	✓	✗	✗	✓	✗
	Modify application settings	✓	✗	✗	✓	✗
	Modify assets	✓	✗	✗	✓	✗
	Read application settings	✓	✗	✗	✓	✗
	Read Assets	✓	✗	✗	✓	✗

VOS App	App Settings	Super Admin	Manager	Lab Wizard	System Engineer	Operator
Developer Portal		✓	✗	✗	✗	✗
DevOps Portal		✓	✓	✗	✗	✗
Configure Broadcast		✓	✓	✓	✓	✓
	Activate Blackout	✓	✗	✓	✓	✗
	Activate EAS	✓	✗	✓	✓	✗
	Edit Mux Configuration	✓	✗	✓	✓	✗
Playout Monitor		✓	✗	✗	✗	✗
Manipulator		✓	✓	✓	✓	✗
Users & Roles		✓	✗	✗	✗	✗
	Modify application settings	✓	✗	✗	✗	✗
Hub		✓	✓	✓	✓	✗
Configure Channels		✓	✗	✓	✓	✗
	Modify application settings	✓	✗	✓	✓	✗
	Edit service	✓	✗	✓	✓	✗

VOS App	App Settings	Super Admin	Manager	Lab Wizard	System Engineer	Operator
Lab Wizard		✓	✗	✓	✗	✗
	Lab Wizard Write and Delete	✓	✗	✓	✗	✗
	Lab Wizard Write Only	✗	✗	✗	✗	✗
	Modify application settings	✓	✗	✓	✗	✗
Logs		✓	✗	✓	✓	✗
	Modify application settings	✓	✗	✗	✓	✗
Monitor Channels		✓	✓	✗	✓	✓
	Modify application settings	✓	✓	✗	✓	✗
	Switch service source	✓	✓	✗	✓	✓
Notifications		✓	✓	✓	✓	✓
	Modify application settings	✓	✓	✓	✓	✗
Public API		✓	✗	✗	✗	✗
	Modify application settings	✓	✗	✗	✗	✗
Scrambling		✓	✗	✗	✓	✗

VOS App	App Settings	Super Admin	Manager	Lab Wizard	System Engineer	Operator
System	Modify application settings	✓	✗	✗	✓	✗
	Edit Scrambling	✓	✗	✗	✓	✗
		✓	✓	✓	✓	✓
	Modify application settings	✓	✓	✓	✓	✗
Origin		✓	✗	✗	✗	✗
	Modify soap access	✓	✗	✗	✗	✗
Mux Manager		✓	✗	✗	✗	✗

Creating a Harmonic ID in the Harmonic Hub

Harmonic IDs are created in the Harmonic Hub and then imported into a VOS Cloud-Native Software.

ⓘ Info

Only those users with the role of Harmonic Hub Super Admin may create and delete Harmonic IDs.

ⓘ Info

The Harmonic ID must use a domain email address or a Gmail address.

1. From the Harmonic Hub, click **Harmonic ID**.
2. Click the **Add user** icon to open the **Add new user** page.
3. Enter the new user **Email Address** and select a user **Role**.

ⓘ Info

The user role assigned in the Harmonic Hub is not associated with the user role assigned in VOS Cloud-Native Software.

4. If the user role is **Normal**, grant additional permissions if required.

5. Verify that **Email login instructions to user** is selected, and then click **Create**.

Result: The Harmonic ID is added to the VOS corporate account, and may be imported to any VOS Cloud-Native Software associated with that account.

- [Harmonic Hub user roles](#)

Harmonic Hub user roles

A user's role in the Harmonic Hub can be either Super Admin or Normal. Only Super Admins have permissions to add or delete users with a Harmonic ID.

Initially, Harmonic technical support must create a Harmonic ID for a user in your organization and assign the user role of Super Admin. Once a Super Admin exists in the Harmonic Hub, this user can create additional Harmonic IDs and designate other users as Super Admins if desired.

Harmonic Hub user role permissions

Tab	Admin role default?	Normal role default?	Feature	Permission	Description
Welcome	✓	✓			
Software	✓	✓	Software download	Read	Read and download software/templates
	✓	✓	Lab Wizard	Read	Read all profiles
System	✓	✓	System	Read	List all system and read individual record
	✓	✓	Usage report	Report	Access report tab for all system
	✓	✗	System access management	Manage access	Grant/ungrant Harmonic ID access of all system
Harmonic ID	✓	✗	Harmonic ID	Read	List all Harmonic ID and read individual record

Tab	Admin role default?	Normal role default?	Feature	Permission	Description
	✓	✗		Manage	Create, suspend, delete Harmonic IDs Re-send activation email Manage permissions Manage product access Manage users import from external accounts
My Account	✓	✗			
Support	✓	✓	Support Conversation	Read	List and join support conversations
	✓	✗		Manage	Start support conversation
	✓	✗		Notification	Allow to click the watch buttons
	✓	✗	General conversation	Read	List and join general conversations

Importing users from the Harmonic Hub

Once a user ID is created in the Harmonic Hub, Super Admins can import the user ID using the Users & Roles app.

A Harmonic ID can be imported into multiple VOS Cloud-Native Software environments within a VOS corporate account.

1. Click **Users > Settings**.
2. In the **Import Existing Harmonic IDs** section, select the users you wish to grant access to the VOS Cloud-Native Software and then click **Import selected to VOS**.
Result: The imported Harmonic IDs appear under **Unconfirmed VOS users**. By default, the VOS Cloud-Native Software user role is set to **Operator**.
3. Optionally, choose a different user role and then click **Save**.
4. Provide the URL of the VOS Cloud-Native Software to the users you imported so that they may log in, for example: <https://52.36.11.33>.
Result: After users log in to the VOS Cloud-Native Software, their Harmonic IDs appear under **Confirmed VOS users**.

Info

If you must remove a Harmonic ID from a VOS Cloud-Native Software, the Harmonic ID still exists in the Harmonic Hub.

- [Suspending a user account](#)
- [Searching for suspended user accounts from Google Chrome](#)
- [Searching for deleted user accounts](#)

Suspending a user account

Suspend a user account to prevent the user from logging in to a VOS Cloud-Native Software.

Note

You cannot suspend a Super Admin. You must assign the Super Admin a different role first, and then suspend the account.

1. From the **Users** page, click the account you wish to suspend.
2. Click the **Suspend** button and then click **Save**.
Result: The **Suspend** button turns gray to indicate that the account is suspended. If the user tries to log in and their credentials cache is not active, an error message notes that the user account is disabled.
3. When you wish to unsuspend the user account, return to the **User account** pane and click the **Suspend** button again.

Searching for suspended user accounts from Google Chrome

Search for suspended user accounts from Google Chrome.

1. From the Logs app, click **Verbose**.
2. From **Chrome > Options list > Find**, type "State":"DEACTIVE", then press **Enter**.
3. In the **Edit** field, use the **Next** and **Previous** arrows to scroll through the highlighted search hits.

Searching for deleted user accounts

Search for deleted user accounts from the Logs app.

1. From the Logs app, type Deleted User in the **Users and Messages** field.
2. Press **Enter**.
Only log entries that include the string value **Deleted User** are displayed.

Assigning a role to multiple users at once

Super Admins can assign a role to more than one user at a time from the **Roles** page.

1. From the Users & Roles app, click **Roles**.
2. From the **Roles** page, click the role that you wish to assign to users.
3. From the **User Role** pane, click the name of the first user to be assigned the role.
Result: The user account icon located to the left of the username disappears, as does the label showing the user role currently held by the user.
4. Click the username a second time.
Result: The user account icon reappears along with a label showing the newly-assigned user role.
5. Repeat this process for all other users being assigned the user role.
6. Click **Save**.
 - [Removing a role from a user account](#)

Removing a role from a user account

When you remove the role from a user account, the user is automatically assigned an Anonymous role. The user cannot log in again until they are assigned a new role.

1. From the **Roles** page, click the role currently assigned to the user.
2. From the **User Role** pane, click the name of the user you wish to remove this role from.
Result: The user role label disappears.
3. Click **Save**.
4. From the **Delete User Role** message box, click **Yes, Delete**.
5. Click **Save** to confirm the Anonymous role for the user.
The user's role is deleted and the user is assigned the Anonymous role. The user must be assigned a different role before they can log in to VOS.

Creating a custom user role

At a minimum, custom user roles must include access to the System app and the Notifications app.

1. From the **Roles** page, click **+ Role**.
2. In the **Role Title** field, enter a name for the new role.
3. In the **Description** field, enter a brief description of the new role.
4. Select the apps and app options that will be available to role holders.

Info

The **System** app is automatically selected for you and the check box cannot be cleared.

5. Select the **Notifications** app, so that users with the custom roles can log in.
6. Click **Save**.

Note

A custom user role can be deleted only if the role is not assigned to any users.

- [Modifying a pre-defined user role](#)
- [Assigning an ad hoc role to a user](#)
- [Deleting a custom user role](#)

Modifying a pre-defined user role

Creating a custom user role is preferable to modifying a pre-defined user role, which can create confusion for other Super Admins who assign user roles.

1. From the Users & Roles app, click **Roles**.
2. From the **Roles** page, click the role to be modified, and then click **Edit**.

Info

You cannot edit the **Title** or **Description** of pre-defined user roles.

3. From the **Can Access the Following Apps** pane, select the apps and app options that will be available to role holders.
4. Click **Save**.

Assigning an ad hoc role to a user

An ad hoc role is a unique role assigned to a particular user who requires custom access to VOS apps.

1. From the Users & Roles app, click **Users**.
2. From the **User Accounts** list, click the name of the user receiving the ad hoc role.
3. From the **User Account** pane, select **Role > Ad Hoc Role**.
4. Select the apps and app options that will be available to the user and then click **Save**

Deleting a custom user role

Super Admins can delete a custom role from the Users & Roles app.

A custom user role can be deleted only if the role is not assigned to any users, so assign users with custom roles another role before deleting the custom role. When you delete a role from the User's Role pane, it can no longer be assigned to users.

1. From the Users & Roles app, click **Roles**.
2. Select the role you want to delete, and then click **Edit**.
3. Click **Delete**, and then click **Delete** again to confirm.

Viewing user logins and logouts

Use the Logs app to view user logins and logouts.

- From **Logs app > Users and Messages field**, type logged in or logged out and then press **Enter**.
Result: Only log entries that include the term logged in or logged out display.

Pairing Origin servers for 1+1 geo-redundancy

Enable active-active packaging-only services on two VOS Origin servers in the System **Settings**.

Note

Harmonic recommends using separate load balancers within each VOS Cloud-Native Software that will be paired. All controller nodes should be configured as the upstream of the load balancer. Then, use the IP addresses of the load balancers for the primary and secondary VOS **Host Address**.

Important

If any services are running on either VOS Cloud-Native Software, they must be restarted after the instances are paired. The service that is activated *first* becomes the master. The second activated service becomes the slave and synchronizes with the master.

- Log into the VOS Cloud-Native Software that you wish to set as the primary instance and then do the following:
 - From the System app, select **Settings > Advanced**.
 - For **Role**, choose **Primary** and then enter the VOS public **Host Address**.
 - Click **Save**.
- Log into the VOS Cloud-Native Software that you wish to set as the secondary instance and then do the following:
 - From the System app, select **Settings > Advanced**.
 - For **Role**, choose **Secondary** and then enter the VOS public **Host Address**.
 - For **Primary VOS Host address**, enter the public IP address of the primary VOS Cloud-Native Software.

Note

Ensure that this IP address matches the IP address that was entered in step 1.

- Click **Save**.

Related information

[Configuring identical services for geo-redundancy](#)

Setting remote support access

Remote support access is used to enable secured remote connectivity via Bomgar for support activities from Harmonic.

For VOS Cloud-Native Software only, the Bomgar software is part of the installed VOS software bundle and set to be Disabled by default. Harmonic Support personnel can only access the VOS Cloud-Native Software via Bomgar after the Remote Support Access functionality is turned on via the VOS UI.

1. From the System app, click **Settings**.

2. Select the **General** tab.

The screenshot shows the 'General' tab selected in the top navigation bar. Below it, there are several configuration sections:

- COMPANY NAME:** A text input field containing "VOS K8S Test".
- RUNTIME NAME:** A text input field containing "Tempe".
- RUNTIME LOCATION — City:** A text input field containing "San Jose".
- State/Province:** A text input field containing "California".
- Country:** A text input field containing "US".
- RUNTIME MAIN URL — you will login VOS only via this URL:** A text input field with placeholder text "E.g., https://172.27.211.231".
- REMOTE SUPPORT ACCESS:** A switch button labeled "ON" which is currently active.

3. Turn on the **Remote Support Access**.

Setting the billing PO for invoicing

VOS Cloud-Native Software deployment provides UI and API to set the billing PO for invoicing.

1. From the System app, click **Settings**.

2. Select the **General** tab.

The screenshot shows the 'General' tab of a deployment configuration interface. It includes fields for Runtime Name (Harmonic VOS (Hostname: vosha)), Runtime Location (City: San Jose, State/Province: CA, Country: USA), Runtime Main URL (https://104.198.108.151), Services Needed (IPTV, Multiscreen), and a dropdown for 'SELECT THE PO NUMBER FOR HUB' containing options like '100000:Hong Kong (VOS MS Automated Test)' and '100001:Hong Kong 2 (VOS MS Automated Test)'. The 'ENTER READ ONLY MODE PERIOD' field is set to '2 Days'. The 'VIDEO LANGUAGES' field is set to 'US-West'.

3. At the first run setup process of VOS Cloud-Native Software deployment, a PO Number list is available for operators to select the correct PO Number for billing.

REST API

The following API provides the PO Number options for the Hub Account belonging to the VOS Cloud_Native Software deployment.

Method	API	Description
GET	/msconnector/v1/billing	Get the billing information options including poNumber, Account Location Name on this Hub Account

The operator can use the following API to set the PO number for this CNS deployment based on the provided options above.

Method	API	Description
POST	/msconnector/v1/po_number/{po_number}	Set the PO Number of this CNS deployment.

Managing profiles

VOS includes default transcoding and destination profiles, which you can edit and manage from the Lab Wizard app.

Both the Super Admin and Lab Wizard roles may manage profiles. If your workflow requires additional profiles that are not provided by default, you must obtain them from Harmonic.

Note

Connectivity to the Harmonic Hub is required in order to create, modify, and delete profiles.

- [Lab Wizard app overview](#)
- [About profile versions](#)
- [Profile parameters](#)
- [Modifying a profile](#)
- [Validating a profile](#)
- [Committing an updated profile version to affected services](#)
- [Viewing a profile changelog](#)
- [OTT track filters \(DRM track filters\)](#)
- [Configuring Dolby stereo source to Dolby 5.1 output via REST API](#)

Lab Wizard app overview

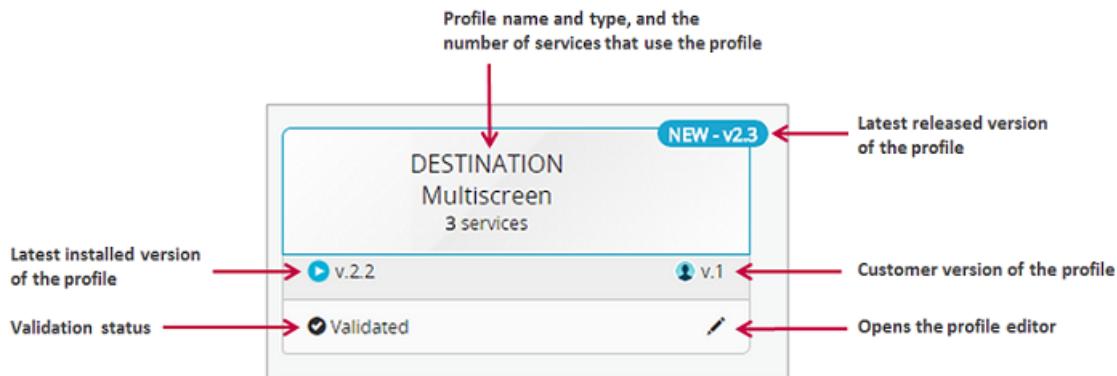
Understand the Lab Wizard user interface.

- [Profile panel](#)
- [Profile Editor](#)

Profile panel

The **Profile Panel** displays important details about the profile and provides access to the **Profile Editor**.

Profile panel elements



VOS update required

If a VOS update is required before you can install the latest released version of a profile, the following message appears on the **Profile panel**:



Related information

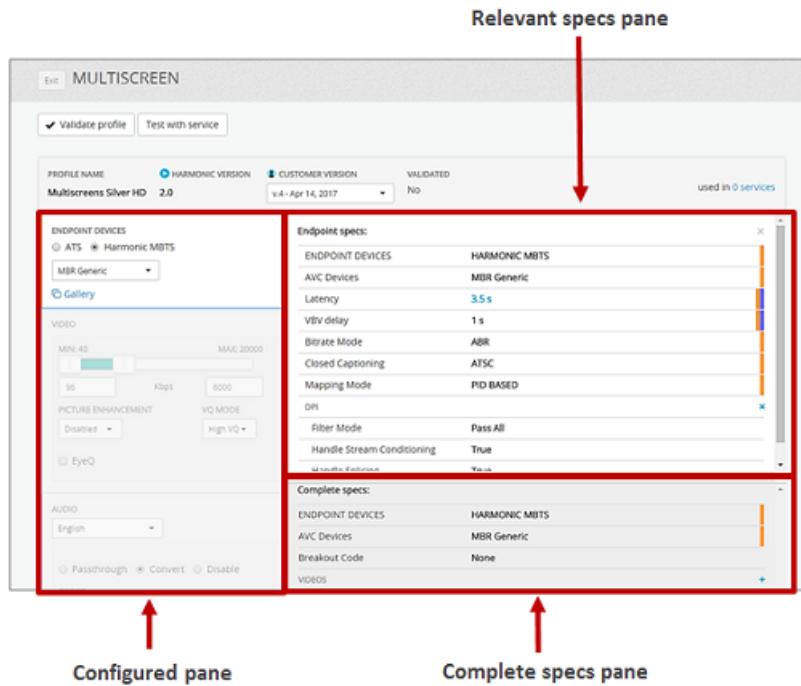
[About profile versions](#)

[Upgrading VOS Runtime software](#)

Profile Editor

The **Profile Editor** interface is divided into three sections.

Profile Editor

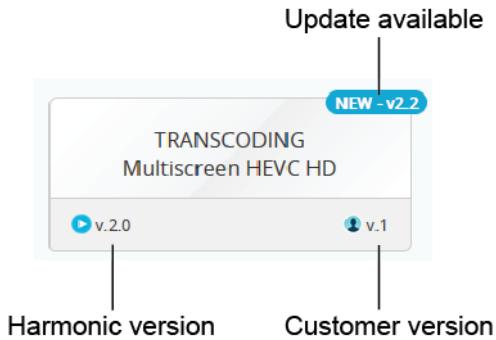


Configured pane	<p>Includes the most commonly used configuration options and settings.</p> <div style="border: 1px solid #ccc; padding: 10px; margin-top: 10px;"> Note If you must modify a default profile, Harmonic recommends changing the settings in the Configured pane only. </div>
Relevant specs pane	Settings in this pane vary based on the selection in the Configured pane.
Complete specs pane	Read-only view of all the configuration settings for the profile.

About profile versions

Each profile has a Harmonic version number and a customer version number.

Profile version information



Harmonic version number

Updates to the Harmonic version number are at the decimal level (for example: 1.1, 1.2, 1.3, etc.). But whenever a new property or feature is added to the profile, the Harmonic version number is increased to the next whole number. For example, 1.3 becomes 2.0.

Customer version number

When you update a profile, the customer version number is increased by one whole number. This version indicates the number of times the profile has been modified, plus 1. For example, a version number of 4 indicates that the profile has been modified 3 times.

After you edit a profile, a new profile version becomes available in the Versions app, which you must validate before you can apply it to affected services.

If VOS update required appears on the **Profile Panel**, it means that:

- Your VOS Cloud-Native Software version is not recent enough to support the latest profile upgrade.
- Profiles cannot be updated until the VOS Cloud-Native Software has been upgraded.
- Services and destinations created using an older profile version will continue to run until you upgrade the VOS Cloud-Native Software.

Profile parameters

You can update parameters for the IPTV, Multiscreen and Destination profiles.

- [IPTV profile parameters](#)
- [TS Multiplexer profile parameters](#)
- [Multiscreen profile parameters](#)
- [Destination profile parameters](#)

IPTV profile parameters

Refer to parameters descriptions when you need to update parameters for the IPTV profile.

- [Set-top Box parameters](#)
- [DPI Parameters](#)
- [Video parameters](#)

- [Audio parameters PROFILES](#)
- [Metadata parameters](#)

To modify the IPTV profile parameters, navigate to **Lab Wizard** app > **IPTV**.

Set-top Box parameters

Set-top Box	<p>Options: Broadcast ID, Cable ATSC and SCTE 20, SCTE 20, Closed Caption (Chinese Standard), IPTV ARIB , IPTV Media Room, IPTV Proprietary ARIB.</p> <div style="border: 1px solid #f0e68c; padding: 10px;"> <p>Note</p> <p>When setting the set-top box mode to "<i>Broadcaster ID</i>", the DVB AU information and Broadcast ID can be enabled in the video output by the following steps:</p> <ol style="list-style-type: none"> 1. Create a Divitrack Pool with Broadcast Divitrack destination. (Refer to Creating a DiviTrack/Statmux pool for IPTV/Broadcast destination for details.) 2. Create a mux service: <ol style="list-style-type: none"> a. Use the auto-generated Divitrack Pool Source for the mux service. b. Create a mux destination for the mux service. c. Activate the mux service. </div>
TS Bitrate	<p>This refers to the output TS bitrate which will be auto-calculated depending on the Audio Match By option selected in the IPTV profile:</p> <ul style="list-style-type: none"> • When Audio Match By is set to Language, all audio profiles of <i>language-based</i> audio streams will be taken for calculating feasible output video bitrates. • When Audio Match By is set to Source Label, all audio profiles of <i>stream-based</i> audio streams will be taken for calculating feasible output video bitrates.
Audio Match By	<p>Options:</p> <ul style="list-style-type: none"> • Language: Audio streams are processed based on language. • Source Label: Audio streams are processed based on stream.

Output PMT PID	The Program Map Table (PMT) PID that applies to the only program in the generated output.
Closed Captioning	Options: SCTE 20, ATSC.
Mapping Mode	Provisioning can be based on PID or Program Number.

DPI Parameters

Filter Mode	Options: Pass All, Drop All.
Handle Stream Conditioning	This is used for the transcoder to handle stream conditioning at splice point to prepare for destination device.
Handle Splicing	This is used for the transcoder to handle splicing.

Video parameters

Processing	Options: Convert, Passthrough, Disabled.
Latency	The desired latency time (expressed in second) for the video stream output. Options: 2.5 s, 3.5 s, 5.5 s.
VBV Delay	This refers to the video buffering verifier buffer time (expressed in second), changed according to latency.
Vertical Resolution	The resolution of vertical video.

Resolution	<p>The resolution of the output video.</p> <p>If the "FOLLOW_INPUT" mode is selected, this allows the output video resolution change to be updated to follow the input resolution when the source is updated from NMOS. When the encoder starts up, it will detect the input resolution and begin outputting with that same spatial resolution. If the input video resolution changes without an input switch triggered by NMOS, the encoder will ignore the input resolution change and continue to output at the same resolution it has been using previously.</p> <div style="border: 1px solid #fca; padding: 10px; margin-top: 10px;"> <p>⚠ Note</p> <p>Only these input resolutions support the "FOLLOW_INPUT" mode: 720p 59.94, 1080p 23.976 / 1080i 29.97</p> </div>
Video Bitrate	This refers to the video encoding bitrate.
Frame Rate	<p>The frame rate of the output video stream.</p> <p>If the "FOLLOW_INPUT" mode is selected for "Resolution", the "Frame Rate" will also be selected as "FOLLOW_INPUT" automatically.</p>
Codec	The codec for video encoding/transcoding.
EBP Mode	This refers to the Encoder Boundary Point standard being used.
GOP Option	<p>Options:</p> <ul style="list-style-type: none"> • Open: Encoded frames may use reference frames outside their GOP (Best for VQ). • Closed: Encoded frames are not allowed to use reference frames outside their GOP. • Fixed: Duration of the GOP is fixed and equal to GOP Len. • Capped: Duration of the GOP can not exceed GOP Len.
Mini GOP Len M	This refers to the minimum number of frames in GOP for M frames. You need to set the number of B picture between I picture and P picture in order to achieve the desired GOP structure.

GOP Len N	This refers to the duration of a GOP in frame. In the case of a "fixed" GOP option, this is the exact duration of the GOP. In the case of a "Capped" GOP option, this is the maximum duration of a GOP.
Picture Enhancement	This is used to improve perceivable video quality at "non stressful operating points". Options: Disabled, Weak, Very Weak, Vivid.
VQ Mode	This is used to set the quality for the output video stream. Options: <ul style="list-style-type: none"> Automatic: If Auto selected, VOS will automatically select appropriate video quality for output streams. High VQ: If High VQ is selected, output streams will be encoded with good subjective visual quality. Objective: If Objective is selected, output streams will be encoded with good Peak Signal-to-Noise Ratio (PSNR) score. High Density: If High Density is selected, VQ will be traded-off for enabling more transcoding channels to perform concurrently.
Stress Bias	This is used to improve perceivable video quality at "stressful operating points" and "very stressful operating points". Options: Clean (Soft Cleaner), Balanced, Sharp (Sharper Blockier).
VQ Boost	This is used to enable improvement on video quality. Options: Enabled, Disabled.
Encoding Profile	This refers to the video encoding profile.
Level	This is the data depth for the given codec and profile. The level specifies the data constraints for settings such as frame rate, or maximum Width and Height.
Generate PIP	If True is selected, the Picture in Picture (PIP) mode and associated features are enabled for the output video stream.
Output PID	This refers to the PID which can be used for the output video stream. The default value is -1, which means disabled.

Audio parameters

PROFILES

Source Label	This field appears only if the Audio Match By mode is set to Source Label . This refers to a typical label (e.g. audio_1) that can be assigned to the output audio stream when grooming the source input.
Processing	Options: Convert, Passthrough, Disabled.
Codec	The desired codec that is used to encode/transcode the input audio stream.
Channels	The audio modes that are available for audio channels.
Sample Rate(kHz)	The sample rate of the encoding audio stream (expressed in kHz).
Bitrate(kbps)	The bitrate for the encoding audio stream (expressed in kbps).
Level Mode	<p>This is used to control the audio loudness level for the audio output:</p> <ul style="list-style-type: none"> Follow Input: If selected, This allows the level of the audio output identical to the audio input source. Target Level: If selected, you can specify the target audio level details on the Target Level (dB) field. HALC-EBU R.128: If selected, VOS will take the specified loudness standard for the output audio stream. HALC-ATSC A/85: If selected, VOS will take the specified loudness standard for the output audio stream. HALC-TAIWAN: If selected, VOS will take the specified loudness standard for the output audio stream. Static Gain: If selected, you can specify the static audio gain details on the Static Gain (dB) field.
Target Level (dB)	This is the target level of loudness value, in decibels, for the output audio stream.
Static Gain (dB)	This is the static gain value , in decibels, for the output audio stream. The default value is 0 dB.
Output PID	This refers to the PID which can be used for the output audio stream.

Metadata parameters

NIELSEN ID3 Breakout Code	If Nielsen Extraction is enabled, select the Breakout Code that fulfills the Nielsen model. Options: <ul style="list-style-type: none"> • Live Content with Same TV Ads: Original simulcast content with same Ad-load. • Live Content without Same TV Ads: Original simulcast content with no or altered Ad-load.
Source Label	This refers to a typical label (e.g. SCTE-35) that can be assigned to the output data stream when grooming the source input.
Output PID	This refers to the PID which can be used for the output data stream.
PIP Output PID	This refers to the PID which can be used for the output data stream with Picture in Picture (PiP) enabled.
Burn In DVB Subtitles	If True is selected, VOS burns DVB subtitles into the video. <div style="border: 1px solid #fca; padding: 10px; margin-top: 10px;"> ⚠ Note <p>If the DVB subtitle is burned in, the DVB subtitle PID will not be present at the output.</p> </div>
Bitrates (Kbps)	This refers to the bitrate set for the output data stream.

Processing Requirements parameters

CPU Requirement	Specify the number of CPU cores that must be allocated to the services using this profile. Please contact Harmonic representatives before changing this parameter.
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Memory Requirement	<p>Specify the amount of memory (MB) that must be allocated to the services using this profile.</p> <p>Please contact Harmonic representatives before changing this parameter.</p>
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Related information

[Grooming the source input](#)

TS Multiplexer profile parameters

Refer to parameters descriptions when you need to update parameters for the TS Multiplexer profile.

- [TS Bitrate parameters](#)
- [Signaling Table parameters](#)
- [PID Scheme parameters](#)
- [Processing Requirements parameters](#)

To modify the TS Multiplexer profile parameters, navigate to **Lab Wizard** app > **TS Multiplexer**.

TS Bitrate parameters

TS Bitrate	This refers to the output TS bitrate.
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Signaling Table parameters

Table Name	<ul style="list-style-type: none"> • SDT Actual • PAT • PMT
Building Mode	<ul style="list-style-type: none"> • None • Local

PID Scheme parameters

Default PID Mapping	<ul style="list-style-type: none"> • Keep input PID • Paradigm
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Processing Requirements parameters

CPU Requirement	<p>Specify the number of CPU cores that must be allocated to the services using this profile.</p> <p>Please contact Harmonic representatives before changing this parameter.</p>
Memory Requirement	<p>Specify the amount of memory (MB) that must be allocated to the services using this profile.</p> <p>Please contact Harmonic representatives before changing this parameter.</p>

Multiscreen profile parameters

Refer to parameters descriptions when you need to update parameters for the Multiscreen profile.

- [Endpoint Devices parameters](#)
- [DPI Parameters](#)
- [Video parameters](#)
- [PROFILES](#)
- [Audio parameters PROFILES](#)
- [Metadata parameters](#)

To modify the Multiscreen profile parameters, navigate to **Lab Wizard** app > **Multiscreen**.

Endpoint Devices parameters

ENDPOINT DEVICES	Options: ATS, Harmonic MBTS.
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Audio Match By	<p>Options:</p> <ul style="list-style-type: none"> Language: Audio streams are processed based on language. Source Label: Audio streams are processed based on the stream.
Output PMT PID	The Program Map Table (PMT) PID that applies to the only program in the generated output.
Bitrate Mode	Options: VBR, CBR, ABR.
Closed Captioning	Options: SCTE 20, ATSC.
Mapping Mode	Provisioning can be based on PID or Program Number.

DPI Parameters

Filter Mode	Options: Pass All, Drop All.
Handle Stream Conditioning	This is used for the transcoder to handle stream conditioning at splice point to prepare for the destination device.
Handle Splicing	This is used for the transcoder to handle splicing.

Video parameters

Processing	Options: Convert, Passthrough, Disabled.
Video Bitrate Min	The minimum available video encoding bitrate.
Video Bitrate Max	The maximum available video encoding bitrate.
Latency	<p>The desired latency time (expressed in second) for the video stream output.</p> <p>Options: 2.5 s, 3.5 s, 5.5 s.</p>
VBV Delay	This refers to the video buffering verifier buffer time (expressed in second), changed according to latency.

Picture Enhancement	This is used to improve perceivable video quality at "non stressful operating points". Options: Disabled, Weak, Very Weak, Vivid.
VQ Mode	This is used to set the quality for the output video stream. Options: <ul style="list-style-type: none"> Automatic: If Automatic is selected, VOS will automatically select appropriate video quality for output streams. High VQ: If High VQ is selected, output streams will be encoded with good subjective visual quality. Objective: If Objective is selected, output streams will be encoded with good Peak Signal-to-Noise Ratio (PSNR) score. High Density: If High Density is selected, VQ will be traded-off for enabling more transcoding channels to perform concurrently.
Stress Bias	This is used to improve perceivable video quality at "stressful operating points" and "very stressful operating points". Options: Clean (Soft Cleaner), Balanced, Sharp (Sharper Blockier).
VQ Boost	This is used to enable improvement on video quality. Options: Enabled, Disabled.
Aspect Ratio	Pass-through the aspect ratio of the input source, or force the aspect ratio to 16:9 or 4:3.
EyeQ	This is used to enable real-time video compression optimization that delivers optimal viewing experience on internet-connected devices while reducing OTT bitrates.

Frame Rate Conversion

This is used to perform cross framerate conversion between 50 Hz and 59.94 Hz for OTT output profile when output is progressive. The input from 50 Hz video framerate can be converted to progressive 59.94 Hz, or vice versa. This is a video global parameter to enable Multiscreen frame rate conversion.

Options:

- Passthrough: The frequency of "Full" profile (framerate of the output video stream is configured as "Full") in the output will be the same as the input.

For example,

If the input is 50 Hz (e.g. 1080i25 or 720p50), the "Full" profile in the output will be 50 fps.

If the input is 25 Hz (e.g. 1080p25), the "Full" profile in the output will be 25 fps.

- 50Hz Domain: The output framerate will be 50 Hz if the input is 50 Hz video (i.e. 12.5p, 25p, 50p). If input is 59.94 Hz, the output will be converted to the counterpart of 50 Hz domain. For example, if the output is 59.94p in original scheme, it will be converted to 50p. If the output is 29.97p in original scheme, it will be converted to 25p.

- 59.94Hz Domain: The output framerate will be 59.94 Hz if the input is 59.94 Hz video (i.e. 14.98p, 29.97p, 59.94p). If input is 50 Hz, the output will be converted to the counterpart of 59.94 Hz domain. For example, if the output is 50p in original scheme, it will be converted to 59.94p. If the output is 25p in original scheme, it will be converted to 29.97p.

- 25 fps: The output framerate will be set as static 25 fps regardless of the input format. This is used to avoid changes in the VOS output when the input changes.

- If the framerate of the output video stream is configured as "Full" in the video profile, the output framerate will correspond to 25 fps regardless of the input format.

- If the framerate of the output video stream is configured as "Half" in the video profile, the output framerate will be computed as 12.5 fps regardless of the input format.

- If the framerate of the output video stream is configured as "Quarter" in the video profile, the output framerate will be computed as 6.25 fps regardless of the input format.

- 29.97 fps: The output framerate will be set as static 29.97 fps regardless of the input format. This is used to avoid changes in the VOS output when the input changes.

- If the framerate of the output video stream is configured as "Full" in the video profile, the output framerate will correspond to 29.97 fps regardless of the input format.
- If the framerate of the output video stream is configured as "Half" in the video profile, the output framerate will be computed as 14.98 fps regardless of the input format.
- If the framerate of the output video stream is configured as "Quarter" in the video profile, the output framerate will be computed as 7.49 fps regardless of the input format.
- 50 fps: The output framerate will be set as static 50 fps regardless of the input format. This is used to avoid changes in the VOS output when the input changes.
 - If the framerate of the output video stream is configured as "Full" in the video profile, the output framerate will correspond to 50 fps regardless of the input format.
 - If the framerate of the output video stream is configured as "Half" in the video profile, the output framerate will be computed as 25 fps regardless of the input format.
 - If the framerate of the output video stream is configured as "Quarter" in the video profile, the output framerate will be computed as 12.5 fps regardless of the input format.
- 59.94 fps: The output framerate will be set as static 59.94 fps regardless of the input format. This is used to avoid changes in the VOS output when the input changes.
 - If the framerate of the output video stream is configured as "Full" in the video profile, the output framerate will correspond to 59.94 fps regardless of the input format.
 - If the framerate of the output video stream is configured as "Half" in the video profile, the output framerate will be computed as 29.97 fps regardless of the input format.
 - If the framerate of the output video stream is configured as "Quarter" in the video profile, the output framerate will be computed as 14.98 fps regardless of the input format.

Dynamic Frame Rate Encoding	<p>This is used to identify images that are very similar to previous ones or images having very fast motion. It can remove the redundant images and mark the remaining images with the syntax of frame doubling or tripling. Therefore, only the remaining images are encoded and the CPU usage is saved. This is supported for AVC progressive encoding for 50 Hz and 59.94 Hz output.</p> <p>Options: Disabled, Auto.</p>
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PROFILES

Video Bitrate(kbps)	The bitrate of the output video stream (expressed in kbps).
Horizontal Resolution	The resolution of horizontal video.
Vertical Resolution	The resolution of vertical video.
Frame Rate	The frame rate of the output video stream.
Codec	The codec for video encoding/transcoding.
Encoding Profile	This refers to the video encoding profile.
Encoding Level	This is the data depth for the given codec and profile. The level specifies the data constraints for settings such as frame rate, or maximum Width and Height.
Interlace	Set true or false to determine whether interlacing is used for video output.
IDR(s)	This refers to the time interval (expressed in seconds) between IDR (Intra Decoder Refresh) frames that are inserted into the stream. The range must be between 1 and 10.
Mini GOP Len M	This refers to the minimum number of frames in GOP for M frames. You need to set the number of B picture between I picture and P picture in order to achieve the desired GOP structure.

Color conversion	<p>You can configure color space conversion for the video output using the following color modes:</p> <div style="border: 1px solid #f0e68c; padding: 10px; margin-top: 10px;"> <p>⚠ Note</p> <p>This only works with the "HEVC" codec and "H265 Main 10" encoding profile.</p> <ul style="list-style-type: none"> • BT.709 HLG • BT.709 SDR • BT.2020 HLG • BT.2020 HLG - SDR compatibility • BT.2020 HDR-10 • Dolby Version 8.1: VOS supports packaging of Dolby Vision (dynamic HDR video format) Profile 8.1 (i.e. HDR10 cross compatibility) video into "Live HLS", "Live DASH", "Live Low-Latency HLS", "Live Low-Latency DASH" services. • Dolby Version 5: VOS supports Dolby Vision (HDR) single-layer Profile 5 (native DV format) video packaging into HLS-fMP4 services. • ST2094-10: VOS supports the ST 2094-10 standard for Dolby Vision for ATSC-3.0 applications. • ST2094-40: VOS supports the ST 2094-40 standard for Samsung for HDR10+ applications. </div>
HDR Signaling	If this is enabled, HDR Signaling will work with HEVC and H265 Main 10 encoding profile.
Rate Control	<p>This is used to control bitrate based on ABR, EyeQ, and CBR.</p> <ul style="list-style-type: none"> • ABR: Average bitrate (aka Strict ABR rate control). ABR output will have strict average bitrate. i.e. a 2s interval will ensure getting segment size 2x Bitrate (in bps). • EyeQ: VBR output with lower bitrate (content dependant). • CBR: Constant bitrate. Because of VBV delay, there is a chance that the interval size is slightly larger or smaller than 2x Bitrate (in bps) for a 2s interval.
Output PID	This refers to the PID which can be used for the output video stream. The default value is -1, which means disabled.

Audio parameters

PROFILES

Source Label	This field appears only if the Audio Match By mode is set to Source Label . This refers to a typical label (e.g. audio_1) that can be assigned to the output audio stream when grooming the source input.
Processing	Options: Convert, Passthrough, Disabled.
Codec	The desired codec that is used to encode/transcode the input audio stream.
Channels	The audio modes that are available for audio channels.
Sample Rate(kHz)	The sample rate of the encoding audio stream (expressed in kHz).
Bitrate(kbps)	The bitrate for the encoding audio stream (expressed in kbps).
AAC Header	You can configure the container format for the AAC audio data: <ul style="list-style-type: none"> • ADTS • LATM

Nielsen Insertion

If True is selected, you can configure the Nielsen properties accordingly.

Nielsen Watermark	NAES II	NAES VI			NAE S II & VI	NAES CBET	NAES VI & CBET	
Nielsen Mode	REFRAIN	OVERWRITE			REFRAIN	OVERWRITE	OVERWRITE	
Source Type	-	Program	Commercial	VOID Breakout	Program	-	Program	VOID Breakout
Nelesen Watermark Level	PC	PC	-	-	PC	-	PC	-
	FD	FD			FD		FD	
Nielsen CBET Step Aside	-	-	-	-	-	TRUE	TRUE	
						FALSE	FALSE	

	<p>⚠ Note</p> <ul style="list-style-type: none"> • Nielsen properties are available only when the Processing parameter is configured as "Convert". • Only one Nielsen Insertion could be declared by Language or Label. • The availability of some parameters depends on the Nielsen Watermark Type and Source Type.
Level Mode	<p>This is used to control the audio loudness level for the audio output:</p> <ul style="list-style-type: none"> • Follow Input: If selected, This allows the level of the audio output identical to the audio input source. • Target Level: If selected, you can specify the target audio level details on the Target Level (dB) field. • HALC-BS.1770 (EBU): If selected, VOS will take the specified loudness standard for the output audio stream. • HALC-BS.1770 (ATSC): If selected, VOS will take the specified loudness standard for the output audio stream. • HALC-A-WEIGHTING: If selected, VOS will take the specified loudness standard for the output audio stream. • Static Gain: If selected, you can specify the static audio gain details on the Static Gain (dB) field.
Target Level (dB)	<p>This is the target level of loudness value, in decibels, for the output audio stream.</p>
Static Gain (dB)	<p>This is the static gain value, in decibels, for the output audio stream. The default value is 0 dB.</p>
Output PID	<p>This refers to the PID which can be used for the output audio stream.</p>

Metadata parameters

NIELSEN ID3 Breakout Code	If Nielsen Extraction is enabled, select the Breakout Code that fulfills the Nielsen model. Options: <ul style="list-style-type: none"> • Live Content with Same TV Ads: Original simulcast content with the same Ad-load. • Live Content without Same TV Ads: Original simulcast content with no or altered Ad-load.
Source Label	This refers to a typical label (e.g. SCTE-35) that can be assigned to the output data stream when grooming the source input.
Output PID	This refers to the PID which can be used for the output data stream.
PIP Output PID	This refers to the PID which can be used for the output data stream with Picture in Picture (PiP) enabled.
Burn In DVB Subtitles	If True is selected, VOS burns DVB subtitles into the video. <div style="border: 1px solid #fca; padding: 10px; margin-top: 10px;"> ⚠ Note <p>If the DVB subtitle is burned in, the DVB subtitle PID will not be present at the output.</p> </div>
Bitrates (Kbps)	This refers to the bitrate set for the output data stream.

Processing Requirements parameters

CPU Requirement	Specify the number of CPU cores that must be allocated to the services using this multiscreen profile. Please contact Harmonic representatives before changing this parameter.
Memory Requirement	Specify the amount of memory (MB) that must be allocated to the services using this multiscreen profile. Please contact Harmonic representatives before changing this parameter.

Related information

[Grooming the source input](#)

Destination profile parameters

Refer to parameters descriptions when you need to update parameters for the Destination profile.

To modify the Destination profile parameters, navigate to **Lab Wizard** app > **Destination**.

HLS package parameters

Segment Length	The duration of the media segment files (expressed in seconds). The input value can be an integer value (e.g. 6s) or a floating point value down to millisecond (e.g. 6.006s).
DVR Window Size	This controls the availability of media segment files most recently added to the index files (a.k.a. playlists) (expressed in seconds). The value range is from 10 seconds to 7200 seconds.
Segment Retention Period	The duration that the media segment files actually retain in the publishing server (expressed in minutes). The value range is from 1 minute to 120 minutes.
Playlist Filename	<p>The variant playlist lists the URLs of each variant stream to allow clients to switch between encodings dynamically. This setting specifies the file name of the variant playlist excluding file extension (i.e. .m3u8). For example, if this value is set to "master", the actual file name will be "master.m3u8". The default file name of the variant playlist is index.m3u8.</p> <div style="border: 1px solid #f0c987; padding: 10px; margin-top: 10px;"> <p>⚠ Note</p> <p>This is the default Playlist Filename. You can customize the Playlist Filename via Configure Channels > Destinations. From the Destination page, you need to configure the Type as "Origin/CDN" type and Profile as HLS Destination Profile.</p> </div>

Audio Stream Only	If True is selected, audio-only streams will be created and added to the playlist to provide a low-bandwidth alternate stream which are used to conform with the Apple requirements. Select False if the downstream vendor does not support audio-only streams.
Late Binding Audio	If this is enabled, the video and audio variants are packaged separately and the player selects one video profile, it must also one of the audio variants (language, bitrate, codec). This is supported in HLS protocol version 4 or above. If disabled, the video and audio tracks are multiplexed together in the same HLS segments. <div style="border: 1px solid #f0e68c; padding: 10px; margin-top: 10px;"> <p>⚠ Note</p> <p>It is recommended to enable it when several audio variants are available in order to save bandwidth.</p> </div>
Package in fMP4	If True is selected, the media variant will be packaged using the fMP4 (fragmented MP4) format (aka HLS-CMAF packaging format). <div style="border: 1px solid #f0e68c; padding: 10px; margin-top: 10px;"> <p>⚠ Note</p> <p>Mandatory for HEVC video packaging according to HLS specification. VOS also supports packaging of HEVC video into HLS-sTS segments, even if this is not compliant with the HLS specification.</p> </div> <div style="border: 1px solid #f0e68c; padding: 10px; margin-top: 10px;"> <p>⚠ Note</p> <p>You can configure the Nielsen audio watermark for HLS fMP4 output. From the Configure Source app, groom the audio source and set the the "Nielsen" checkbox enabled to indicate which audio stream carries the Nielsen watermarking.</p> </div>

Pass-through Parameter Sets	<p>This refers to the Package in fMP4 enabled for HLS HEVC output.</p> <p>If set to False, the HEVC playlist will show "hvc1" for codec attribute and the SPS/PPS are available only in separate Initialization Segments (they are removed from the video ES and so not included in the video segments).</p> <p>For example, #EXT-X-STREAM-INF:PROGRAM-ID=1,BANDWIDTH=15128000,CODECS="hvc1.2.4.L153.80,mp4a.40.2",RESOLUTION=3840x2160,FRAME-RATE=29.970,AUDIO="audio1".</p> <p>If set to True, the HEVC playlist will show "hev1" for codec attribute and the SPS/PPS are available only in separate Initialization Segments (they are removed from the video ES and so not included in the video segments).</p> <p>For example, #EXT-X-STREAM-INF:PROGRAM-ID=1,BANDWIDTH=15128000,CODECS="hev1.2.4.L153.80,mp4a.40.2",RESOLUTION=3840x2160,FRAME-RATE=29.970,AUDIO="audio1"</p>
Filename for Media Stream	<p>An index file is an ordered list of media URLs and informational tags. Each media URL refers to a media file which is a segment of a single contiguous stream. This setting specifies the file name of the index file (playlist) for each variant stream excluding file extension (i.e. .m3u8). VOS supports customizable file name for media stream.</p> <p>Support patterns: %streamid - Stream ID.</p> <p>For example, User enters: %streamid</p>
Filename for I-Frame	<p>An index file is an ordered list of media URLs and informational tags. Each media URL refers to a media file which is a segment of an I-frame only stream. This setting specifies the file name of the index file (playlist) for each variant stream excluding file extension (i.e. .m3u8). VOS supports customizable Index File Name for I-frame only stream.</p> <p>Supported patterns: %streamid_iframe - I-frame only stream ID.</p> <p>For example, User enters: %streamid_iframe</p>

Segment Filename Prefix	VOS supports customizable segment file names. Supported patterns: %starttime - The start time of the Publishing session. %streamid - Stream ID. %sequence - The sequence number of the media segment. %time - The start time of each segment. For example, User enters: %starttime-%sequence-%streamid-%time
Subtitle Name Pattern	The customization of subtitle track name in HLS variant playlist is supported with the following 3 patterns: %lang - The language code in lowercase. %LANG - The language code in uppercase. %index - An unique index of the subtitle track.
	<p>⚠ Note</p> <p>According to the HLS spec (4.3.4.1.1), "All EXT-X-MEDIA tags in the same Group MUST have different NAME attributes.", users must specify the "%index" in the customized track name in order to avoid the track name conflict in the case when there are 2 subtitle tracks with the same language.</p>
URL Order	Specify whether the playlist URLs are arranged based on ascending bitrate or descending bitrate.
Codecs Attribute	If True is selected, the CODECS attribute will be specified in EXT-X-STREAM-INF in the media playlist.
Segment URI Info	If True is selected, the #EXT-X-KEY tag is repeated for each segment, instead of appearing once each time the key is changed (static key or key rotation use cases).
Floating Point Duration	If True is selected, a playlist with floating-point EXTINF duration up to 3 decimal places will be generated.

Encryption Method	<p>Options:</p> <ul style="list-style-type: none">• Sample AES: If Sample AES is selected, VOS will encrypt each individual media sample (e.g., video, audio, etc.) by its own with AES which is in compliance with HTTP Streaming spec defined by Apple. The player must download the key file to access the content.• Authentec PlayReady: If Authentec PlayReady is selected, VOS will encrypt the content according to AuthenTec's proposal for HLS encryption.• Common Encryption: If Common Encryption is selected, VOS will communicate to KMS to have common encryption using multi-DRM for HLS output.• Discretix PlayReady: If Discretix PlayReady is selected, VOS will encrypt the content according to Discretix's proposal for HLS encryption.• Irdeto PlayReady: If Irdeto PlayReady is selected, VOS will encrypt the content according to Irdeto's proposal for HLS encryption.• AES: If AES is selected, VOS will encrypt the whole segment with AES using a 128 bit key. The player must download the key file to access the content.• Fairplay: If Fairplay is selected, VOS will use the same encryption as Sample AES, but the player will request the key to a FairPlay license server.• Secure Media: If Secure Media is selected, VOS will encrypt the content according to Secure Media's proposal for HLS encryption.• Clear: No encryption (whatever the activation or not of the DRM Add-on in the service configuration).
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 **Note**

VOS supports synchronized HLS internal key generation and pull delivery using HTTPS for geo-redundant deployments. The random encryption keys are used for HLS native content protection (AES, Sample AES) and are available as binary files.

Common Encryption Scheme	<p>This option is only applicable when "Package in fMP4" is set to true for HLS package.</p> <p>Options:</p> <ul style="list-style-type: none"> • CENC_CBCS: If selected, the MPEG-CENC 'cbc' protection scheme (AES-128 CBC mode with partial encryption) will be used for common encryption for HLS-fMP4 packages. This is the recommended option (it is the only protection scheme supported by Apple devices). • CENC_CENC: If selected, the MPEG-CENC 'cenc' protection scheme (AES-128 CTR mode with full encryption) will be used for common encryption for HLS-fMP4 packages.
Enable SEI encryption	<p>This option is only applicable when "Package in fMP4" is set to true for HLS package.</p> <p>If True is selected, the encryption of SEI input will be enabled.</p> <p>If False is selected, the encryption of SEI input will be disabled. No encryption will be processed for the sub-samples along with the total number of sub-samples of 'senc' box is reduced from 3 to 1.</p>
I-Frame Only	<p>If True is selected, the I-Frame playlists will reference to the I-Frames in the video media segments by using the video segment URL and a byte range.</p>
Package Based Key Rotation	<p>If False is selected, the Key Rotation will be used through the DRM Settings tab from the Scrambling app.</p> <p>If True is selected, the local Key Rotation parameters (see below "Key Rotation" and "Key Change Period") are used for this package.</p>
Key Rotation	<p>This option is only applicable when "Package Based Key Rotation" is set to true.</p> <p>Select True to enable key rotation for retrieving a new encryption key per package.</p>
Key Change Period	<p>This option is only applicable when "Package Based Key Rotation" is set to true.</p> <p>This is the period of time the VOS will wait until it retrieves a new encryption key (expressed in seconds).</p>

SCTE-35 Signaling	<p>Options:</p> <ul style="list-style-type: none"> • Base64 Annotation: This enables conversion of SCTE-35 to playlist annotation in HLS using Base64 formatting. (#EXT-X-SPLICEPOINT-SCTE35 tag) • SCTE35 Standard 2019: This enables conversion of SCTE-35 to playlist annotation in HLS using SCTE-35 Standard 2019 format. (#EXT-X-SCTE35 tag) • Google Double Click: This enables conversion of SCTE-35 to playlist annotation in HLS using the Google Ad Manager (formerly DoubleClick) format. (#EXT-X-CUE-OUT/#EXT-X-CUE-IN/#EXT-OATCLS-SCTE35 tags) • UK1: This enables conversion of SCTE-35 to playlist annotation in HLS using the UK1 DAI annotation format. (#EXT-X-CUE-OUT, #EXT-X-CUE-SPAN, #EXT-X-CUE-IN tags) • NBC Universal: This enables conversion of SCTE-35 to playlist annotation in HLS using the NBC SCTE-35 specification. (#EXT-X-SCTE35 and #EXT-X-DATERANGE tags) • Hulu: This enables conversion of SCTE-35 to playlist annotation in HLS using the Hulu specification. (#EXT-X-SCTE35 tag) <div style="border: 1px solid #f0e68c; padding: 10px; margin-top: 10px;"> <p>⚠ Note</p> <p>VOS supports 1+1 synchronized SCTE-35 segmentation & ad markers generation for HLS output.</p> </div>
Low-Latency Live Mode	If True is selected, HLS low-latency packaging will be activated. Each HLS segment will be generated first as a set of standalone partial segments (each one including a CMAF chunk) before availability of the full segment.
Specify Starting Live Point	If True is selected, you need to specify the Starting Live Point.
Starting Live Point	You can specify a positive number that indicates a time offset from the beginning of the Playlist. In contrast, you can specify a negative number that indicates a negative time offset from the end of the last Media Segment in the Playlist.

Target Duration	This is used to set the target segment duration in the output stream playlist. The input value 0 means to follow the segment length.
Enable Sub-folder Mode	If True is selected, a sub-folder will be created for publishing all files (i.e. playlists, segment files, key files) to a single folder.
AVERAGE-BANDWIDTH Attribute	If the bitrate variation is expected to be high (if EyeQ is enabled, for instance), enable this attribute to base bitrate validation on the average bandwidth.
Teletext Handling	Select from the drop-down list to handle the Teletext subtitle input to the HLS output. The current options are "To WebVTT" and "Passthrough". None , one or multiple selections are supported. <div style="border: 1px solid #f0e68c; padding: 10px; margin-top: 10px;"> ⚠ Note <p>The "To IMSC1" option is only available for Teletext Handling when "Package in fMP4" is set to true (i.e. for HLS fMP4 packaging only). The conversion of Teletext into IMSC1 is supported for Live, Start-over, Catch-up, and nPVR services.</p> </div>
Closed Caption Handling	Select from the drop-down list to handle the Closed Caption subtitle input to the HLS output. The current options are "To WebVTT" and "Passthrough". None , one or multiple selections are supported. <div style="border: 1px solid #f0e68c; padding: 10px; margin-top: 10px;"> ⚠ Note <p>The "To IMSC1" option is only available for Closed Caption Handling when "Package in fMP4" is set to true (i.e. for HLS fMP4 packaging only). The conversion of Closed Caption into IMSC1 is supported for Live, Start-over, Catch-up, and nPVR services.</p> </div>

DVB Subtitle Handling	Select from the drop-down list to handle the DVB subtitle input to the HLS output. The current options are "To SMPTE-TT", "Passthrough" and "To WebVTT (OCR)". None, one or multiple selections are supported.
	<p>⚠ Note</p> <p>The "To IMSC1" option is only available for DVB Subtitle Handling when "Package in fMP4" is set to true (i.e. for HLS fMP4 packaging only). The conversion of DVB Subtitle (based on OCR) into IMSC1 is supported for Live, Start-over, Catch-up, and nPVR services.</p>
SCTE-27 Subtitle Handling	Select from the drop-down list to handle the SCTE-27 subtitle input to the HLS output. The current option is "To SMPTE-TT" and "To WebVTT (OCR)". None, one or multiple selections are supported.
Enable absolute master playlist	If True is selected, the absolute master playlist will be generated in HLS file output.
Absolute master playlist filename	If the absolute master playlist is enabled, you can configure the filename as default for the absolute master playlist in HLS output.
	<p>⚠ Note</p> <p>You can customize the absolute master playlist file path via Configure Channels > Destinations. From the Destination page, configure the Type as "Origin/CDN" type and Profile that you have enabled the absolute master playlist. The field "ABSOLUTE BASE URL IN MASTER PLAYLIST" will appear in HLS file output if the absolute master playlist is enabled.</p>
Declare CC in playlist	If True is selected, CC will be declared in the playlist.
Alt Watermarking Output Prefix	<p>If the OTT Watermarking toggle is set to "On", this "Alt Watermarking Output Prefix" field will appear.</p> <p>This prefix will be added to the filename in the alternative playlist. The default value is "b.". For example, b.index.m3u8 could be the Alternative Watermark Playlist Filename.</p>

SCTE-35 Default Auto-return Duration	You can input the desired auto return timeout in seconds for VOS to automatically generate a splice-in SCTE-35 message according to the given timeout value. ⚠ Note It is applied only if there is no splice-in SCTE-35 message received in the source before this timeout expires.
Display HDCP-LEVEL attribute	If True is selected, the HDCP-LEVEL attribute will be added in the master playlist according to Apple recommendations.
DVB TTML Handling	Select from the drop-down list to handle the DVB TTML subtitle input to the HLS output. The current option is "To WebVTT". ⚠ Note The "To IMSC1" option is only available for DVB TTML Handling when "Package in fMP4" is set to true (i.e. for HLS fMP4 packaging only). The conversion of DVB TTML into IMSC1 is supported for Live, Start-over, Catch-up, and nPVR services. The following languages are supported for the conversion of subtitles: Latin, Cyrillic, Chinese Traditional, Chinese Simplified, Japanese, Korean, Vietnamese, Arabic, Thai ⚠ Note Currently only Live services are supported to convert DVB TTML subtitle input to SMPTE-TT output.

<p>Language code standard</p>	<p>Select from the drop-down list the language code standard that must be used to populate the LANGUAGE attribute of the HLS playlist.</p> <p>The following language code standards are supported:</p> <ul style="list-style-type: none"> • ISO 639-1 <ul style="list-style-type: none"> • Alpha-2 code space (2 letters) Examples: 'en', 'de', 'fr' • Force the conversion from ISO 639-2/3 source language code to ISO 639-1 • Unknown ISO 639-2/3 source language codes (e.g. 'qaa', 'qad', 'und', 'mul') are passed through • ISO 639-2/3 (default) <ul style="list-style-type: none"> • Alpha-3 code space (3 letters) Examples: 'eng', 'deu' or 'ger', 'fra' or 'fre' <div style="border: 1px solid #f0c987; padding: 10px;"> <p>⚠ Note</p> <p><i>639-3 = 639-2/T = terminological code = derived from native name ('deu');</i> <i>639-3 = 639-2/B = bibliographical code = derived from English name ('ger')</i></p> </div> <ul style="list-style-type: none"> • Pass-through from source
<p>Common Segment Url Delivery</p>	<p>If True is selected, Common Segment URLs are used for delivery of Live, Start-over and Catch-up applications.</p> <div style="border: 1px solid #f0c987; padding: 10px;"> <p>⚠ Note</p> <p>A specific HLS master playlist URL format must be adopted to use this feature.</p> </div> <div style="border: 1px solid #f0c987; padding: 10px;"> <p>⚠ Note</p> <p>Pull packaging needs to be enabled for the Common Segment URL application.</p> </div>

MSS package parameters

Video Segment Length	The duration of the video segment files (expressed in floating point value, up to milliseconds).
Audio Segment Length	The duration of the audio segment files (expressed in floating point value, up to milliseconds).
DVR Window Size	This refers to the control of the availability of media segment files most recently added to the Media Presentation Description file (expressed in seconds). The value range is from 60 seconds to 7200 seconds.
Segment Retention Period	The duration that the media segment files actually retain in the publishing server (expressed in minutes). The value range is from 1 minute to 120 minutes.
Encryption Method	<p>Options:</p> <ul style="list-style-type: none"> • Clear: If selected, VOS will output the clear content without encryption. • PlayReady: If selected, VOS will communicate to KMS to have the Microsoft PlayReady encryption using multi-DRM. <div style="border: 1px solid #f0e68c; padding: 10px; margin-top: 10px;"> <p>⚠ Note</p> <p>The Encryption Method works in association with the DRM Add-on activation in the service configuration:</p> <ul style="list-style-type: none"> • Clear with DRM add-on = clear • PlayReady with no DRM = Clear • PlayReady with DRM = encrypted </div>
Package Based Key Rotation	<p>If False is selected, the Key Rotation will be used through the DRM Settings tab from the Scrambling app.</p> <p>If True is selected, the local Key Rotation parameters (see below "Key Rotation" and "Key Change Period") are used for this package.</p>

Key Rotation	<p>This option is only applicable when "Package Based Key Rotation" is set to true.</p> <p>Select True to enable key rotation for retrieving a new encryption key per package.</p>
Key Change Period	<p>This option is only applicable when "Package Based Key Rotation" is set to true.</p> <p>This is the period of time the VOS will wait until it retrieves a new encryption key (expressed in seconds).</p>
Subtitle FourCC	You can customize the FourCC (Four-character codes) field of the Smooth Streaming manifest for subtitle tracks.
Subtitle Name Pattern	<p>The customization of subtitle track name in Smooth Streaming manifest is supported with the following 2 patterns:</p> <ul style="list-style-type: none"> • %lang - The language code in lowercase. • %index - An unique index of the subtitle track. <p>Since the track name should be unique in the Smooth Streaming manifest, users must specify the %index in the customized track name in order to avoid the track name conflict in the case when there are 2 subtitle tracks with the same language.</p>
Language Code Letter Case	You can set the letter case of language attribute in audio/subtitle stream index in MSS manifest.
QPC Track Subtype	You can configure the subtype of the QPC track (CAPT or DATA) in every single MSS publishing point for a service.
SCTE-35 Signaling	Select Azure Media Services if the destination profile supports dynamic ad insertion.

Use Repeat Attribute	<p>When False is selected, the Repeat Attribute "r" will not be used. The generated MSS manifest will then be compatible with players based on Silverlight v2.0 or other MSS players not supporting this attribute.</p> <p>When True is selected, the size of the manifest will be much smaller, as the list of available segments can be reduced to only the first segment with its duration and the total number of following segments having the same duration (i.e. value of the Repeat Attribute "r").</p>
Show Ready Segments Only	<p>If True is selected, VOS will wait for all bitrates to be ready and skip to add chunks into manifest for those not ready segments. The latest segment will be added to the output only if all are ready.</p> <p>If False is selected, VOS will not wait for all bitrates and add the latest segment to the output even if all segments are not ready.</p>

DASH package parameters

Segment Length	The duration of the media segment files (expressed in floating point value, up to milliseconds).
DVR Window Size	This refers to the control of the availability of media segment files most recently added to the Media Presentation Description file (expressed in seconds). The value range is from 10 seconds to 7200 seconds.
Minimum Update Period	<p>This allows to indicate to the player about the minimum update frequency of the manifest. The value range is from 0 second to 31536000 seconds (1 year).</p> <p>'-1' is a special value, meaning "Auto"</p> <p>The default value is '-1"/Auto"</p> <p>If MUP = -1/Auto, then the value is equal to min(audioSegmentLength,videoSegmentLength)</p>
Segment Retention Period	The duration that the media segment files actually retain in the publishing server (expressed in minutes). The value range is from 1 minute to 120 minutes.

Presentation Profile	<p>The profile used for generating Media Presentation Description (MPD) file that enables interoperability and signaling use of features in a Media Presentation.</p> <p>The following types are supported:</p> <ul style="list-style-type: none"> ISO Live: This refers to the ISO/IEC 23009-1, 8.4 ISO Base media file format live profile. This is the default and recommended setting. HbbTV ISO BMFF Live: This refers to HbbTV ISOBMFF defined in HbbTV 1.5 specification. DVB DASH Live: This refers to generate live DASH output that conforms to the DVB-DASH standards with the "urn:dvb:dash:profile:dvb-dash:2014" attribute set in the MPD element. ATSC 3.0 Live: This refers to generate live DASH output that conforms to ATSC 3.0 standards with the "urn:mpeg:dash:profile:isoff-broadcast:2015" attribute set in the MPD element. <div style="border: 1px solid red; padding: 10px; margin-top: 10px;"> <p>⚠ Warning</p> <p>If ATSC 3.0 Live is selected, the Minimum Update Period should be set to 0 for broadcast distribution.</p> </div>
Encryption Method	<p>Options:</p> <ul style="list-style-type: none"> Clear: If selected, VOS will output the clear content without encryption. Common Encryption: If selected, VOS will communicate to KMS to have common encryption using multi-DRM. Encryption will be based on MPEG-DASH. <div style="border: 1px solid orange; padding: 10px; margin-top: 10px;"> <p>⚠ Note</p> <p>The Encryption Method works in association with the DRM Add-on activation in the service configuration:</p> <ul style="list-style-type: none"> Clear with DRM add-on = clear CENC with no DRM = Clear CENC with DRM = encrypted </div>

MPD Filename	<p>The name of Media Presentation Description (MPD) file which is used to describe a media presentation and allows the players to access the DASH service.</p> <div style="border: 1px solid #fca; padding: 10px; margin-top: 10px;"> <p>⚠ Note</p> <p>This is the default MPD Filename. You can customize the MPD Filename via navigating to Configure Channels > Destinations and configuring Type as "Origin/CDN" type and Profile as "DASH Destination".</p> </div>
Representation Pattern	<p>The pattern for generating the Representation ID which is used in the Media Presentation Description (MPD) file for each encoded version of video/audio.</p> <p>The following patterns are supported:</p> <ul style="list-style-type: none"> %starttimeitem – The start time of the Publishing session %streamIditem – Stream ID
Package Based Key Rotation	<p>If False is selected, the Key Rotation will be used through the DRM Settings tab from the Scrambling app.</p> <p>If True is selected, the local Key Rotation parameters (see below "Key Rotation" and "Key Change Period") are used for this package.</p>
Key Rotation	<p>This option is only applicable when "Package Based Key Rotation" is set to true.</p> <p>Select True to enable key rotation for retrieving a new encryption key per package.</p>
Key Change Period	<p>This option is only applicable when "Package Based Key Rotation" is set to true.</p> <p>This is the period of time the VOS will wait until it retrieves a new encryption key (expressed in seconds).</p>

SCTE-35 Signaling	<p>Options:</p> <ul style="list-style-type: none"> Base64 annotation: This enables conversion of SCTE-35 to playlist annotations in DASH (base64 formatting). Harmonic Annotation 2020: This enables conversion of SCTE-35 to playlist annotation in DASH using the Harmonic Annotation 2020 standard. (EventStream with new schemeUri "urn:hlit:scte35:2020:1" and corresponding attribute hlit-scte35:elapsedTime and hlit-scte35:segmentTypeid would be introduced in DASH manifest.) NBC Universal: This enables conversion of SCTE-35 to playlist annotation in DASH using the NBC SCTE-35 specification. <div style="border: 1px solid #fca; padding: 10px; margin-top: 10px;"> <p>⚠ Note</p> <p>VOS supports 1+1 synchronized SCTE-35 segmentation & ad-markers generation for DASH output.</p> </div>
UTC Timing Scheme Id Uri	Allows better synchronization between DASH server and client. Possible values are: <ul style="list-style-type: none"> None (default) urn:mpeg:dash:utc:http-xsdate:2014 urn:mpeg:dash:utc:http-iso:2014 urn:mpeg:dash:utc:http-ntp:2014 urn:mpeg:dash:utc:ntp:2014 urn:mpeg:dash:utc:http-head:2014
UTC Timing Value	If a timing scheme is set for UTC Timing Scheme Id Uri , then the URI of a time server supporting this scheme must be configured as "UTC Timing Value". It is recommended to use " urn:mpeg:dash:utc:http-iso:2014 " with the time server URL "http://time.akamai.com/?iso&ms".
Low-Latency Live Mode	If True is selected, DASH low-latency packaging will be activated. The DASH segments will be generated as a set of multiple CMAF chunks and delivered using HTTP chunked-transfer encoding.

Insert Service Desc. to Manifest	<p>⚠ Note</p> <p>The “Insert Service Desc. to Manifest” option is applicable only when the “Low-Latency Live Mode” is set to True.</p> <p>If True is selected, the "ServiceDescription" element will be added to the DASH client manifest (MPD) automatically. This element is used for improving control of players for low-latency decoding.</p> <p>The ServiceDescription element including the following attributes which can be used for customizing latency and playback rate:</p> <ul style="list-style-type: none"> • Service Desc. Scope Scheme Id Uri • Service Desc. Scope Value • Service Desc. Latency Target • Service Desc. Latency Max • Service Desc. Latency Min • Service Desc. Playback Rate Max • Service Desc. Playback Rate Min
Teletext Handling	Select from the drop-down list to handle the DASH subtitle format(s) in which the Teletext subtitles will be converted. The current options are "To WebVTT" and "To SMPTE-TT". None, one or multiple selections are supported.
DVB Subtitle Handling	Select from the drop-down list to handle the DASH subtitle format(s) in which the DVB-SUB subtitles will be converted. The current options are "To SMPTE-TT", "To WebVTT (OCR)" and "To SMPTE-TT text-based (OCR)". None, one or multiple selections are supported.
Closed Caption Handling	Select from the drop-down list to handle the DASH subtitle format(s) in which the Closed-Caption (CEA-608/708) subtitles will be converted. The current options are "To WebVTT" and "To SMPTE-TT". None, one or multiple selections are supported.
SCTE-27 Subtitle Handling	Select from the drop-down list to handle the DASH subtitle format(s) in which the SCTE-27 subtitles will be converted. The current options are "To SMPTE-TT", "To WebVTT (OCR)" and "To SMPTE-TT text-based (OCR)". None, one or multiple selections are supported.
Use Absolute Timestamps	<p>If True is selected, the "availabilityStartTime" parameter present in the DASH manifest is always set to the fixed and default value corresponding to March 1, 2013.</p> <p>If False is selected, the "availabilityStartTime" parameter present in the DASH manifest is the timestamp corresponding to the start time of the packaging service.</p>

Pass-through Parameter Sets	<p>This is used to configure whether hvc or hev is used for DASH HEVC output.</p> <p>If set to False, the HEVC DASH manifest will show "hvc1" for codec attribute and the SPS/PPS are available only in separate Initialization Segments (they are removed from the video ES and so not included in the video segments).</p> <p>For example, <Representation ... codecs="hvc1.2.4.L120.80"</p> <p>If set to True, the HEVC DASH manifest will show "hev1" for codec attribute and the SPS/PPS are available only in separate Initialization Segments (they are removed from the video ES and so not included in the video segments).</p> <p>For example, <Representation ... codecs="hev1.2.4.L120.80"</p>
Insert default Key ID to manifest	If True is selected, the default_KID (Key Identifier) attribute will be added in the default ContentProtection element for DASH-CENC encryption.
Insert ProducerReferenceTime to Manifest	<p>⚠ Note</p> <p>The "Insert ProducerReferenceTime to Manifest" option is applicable only when the "Low-Latency Live Mode" is set to False. If "Low-Latency Live Mode" is set to True, this option is automatically enabled and hidden in the packaging configuration.</p>
	<p>If True is selected, the Producer Reference Time will be inserted to the DASH manifest and segments:</p> <ul style="list-style-type: none"> Enable passing through the timestamps of the packaged media components. The timestamps are calculated based on the configuration of the "PACKAGER CLOCK" global parameter, with possible values "System Wall-clock" (the time of ingest by VOS is used) and "Source Timecodes" (the time corresponding to the timecode embedded in the original video source is used). Permit DASH client to determine, monitor and control latency. Enable measuring and potentially controlling the latency between the production of the media time and the media decoding by the player.
Alt Watermarking Output Prefix	If OTT Watermarking is set to "On", this "Alt Watermarking Output Prefix" field will appear. This prefix will be added to the filename in the alternative MPD file. The default value is " b. ". For example, b.master.mpd could be the Alternative Watermark MPD Filename.
Early Available Period	If True is selected, SCTE-35 messages are inserted before the beginning of the period corresponding to the splice_time of this SCTE-35 message (a period with no start time is used for that purpose).

SCTE35 ContentID Handling	<p>⚠ Note</p> <p>The "SCTE35 ContentID Handling" mode is applicable only when the "SCTE-35 Signaling" is enabled.</p> <p>If True is selected, the event message(s) with base64 string of "Content Identification" signal will be shown in the DASH manifest.</p>
SCTE-35 Default Auto-return Duration	<p>You can input the desired auto return timeout in seconds for VOS to automatically generate a splice-in SCTE-35 message according to the given timeout value.</p> <p>⚠ Note</p> <p>It is applied only if a splice-out SCTE-35 message is received and there is no corresponding splice-in SCTE-35 message received in the source before this timeout expires.</p>
DVB TTML Handling	<p>Select from the drop-down list to handle the DASH subtitle format(s) in which the DVB TTML subtitles will be converted. The current option is "To SMPTE-TT".</p> <p>The following languages are supported for the conversion of subtitles: Latin, Cyrillic, Chinese Traditional, Chinese Simplified, Japanese, Korean, Vietnamese, Arabic, Thai</p> <p>⚠ Note</p> <p>Currently only Live services are supported to convert DVB TTML subtitle input to SMPTE-TT output.</p>
Common Segment Url Delivery	<p>If True is selected, Common Segment URLs are used for delivery of Live, Start-over and Catch-up applications.</p> <p>⚠ Note</p> <p>A specific DASH manifest URL format must be adopted to use this feature.</p> <p>⚠ Note</p> <p>Pull packaging needs to be enabled for the Common Segment URL application.</p>

Fill Gap Near Period Start	<p>For some circumstances, the total length of audio can be shorter or longer than the total length of the video.</p> <p>If True is selected, the VOS packager will fill the gap near the start of the following period with the extra segment.</p>
Use PTS As PTO	<p>If True is selected, the package output will use the first Presentation Time Stamp (PTS) of audio as the Presentation Time Offset (PTO) of the audio adaptation set, so all video and audio will start at 0 of all Periods.</p>
Generate Thumbnail	<p>If True is selected, the DASH package output will enable thumbnail generation for Live and packaging on-the-fly services.</p>
Thumbnail Height	<p>Configure the thumbnail height, ranging from 1 px to 64000 px.</p> <div style="border: 1px solid #f0e68c; padding: 5px; margin-top: 10px;"> ⚠ Note <p>This option is available only when the Generate Thumbnail is set to True.</p> </div>
Static POTF thumbnail per row	<p>Configure the number of thumbnails tiled horizontally / how many thumbnails per row.</p> <div style="border: 1px solid #f0e68c; padding: 5px; margin-top: 10px;"> ⚠ Note <p>This option is available only when the Generate Thumbnail is set to True.</p> </div>
Static POTF thumbnail per column	<p>Configure the number of thumbnails tiled vertically / how many thumbnails per column.</p> <div style="border: 1px solid #f0e68c; padding: 5px; margin-top: 10px;"> ⚠ Note <p>This option is available only when the Generate Thumbnail is set to True.</p> </div>
Insert ProducerReferenceTime to Timeshift Manifest	<p>This enables synchronized playback of multiple streams (e.g. different camera angles of the same game).</p> <p>If True is selected, the Producer Reference Time (PRFT) will be added to the DASH manifest for Catch-up, Start-over and Long-Lasting Catch-up applications.</p>

CMAF package parameters

Generic Parameters	
Segment Length	The duration of the media segment files (expressed in floating point value, up to milliseconds).
DVR Window Size	This refers to the control of the availability of media segment files most recently added to the Media Presentation Description file (expressed in seconds). The value range is from 10 seconds to 7200 seconds.
Segment Retention Period	The duration that the media segment files actually retain in the publishing server (expressed in minutes). The value range is from 1 minute to 120 minutes.
Encryption Method	<p>Options:</p> <ul style="list-style-type: none"> Clear: If selected, VOS will output the clear content without encryption. Common Encryption: If selected, VOS will communicate with the KMS server to get a key and the DRM signalling for one or multiple DRM systems. Encryption will be based according to the Common Encryption Scheme configured for CMAF packages.
Enable SEI Encryption	<p>If True is selected, the encryption of SEI input will be enabled.</p> <p>If False is selected, the encryption of SEI input will be disabled. No encryption will be processed for the sub-samples along with the total number of sub-samples of 'senc' box is reduced from 3 to 1.</p>
Package Based Key Rotation	<p>If False is selected, the Key Rotation will be used through the DRM Settings tab from the Scrambling app.</p> <p>If True is selected, the local Key Rotation parameters (see below "Key Rotation" and "Key Change Period") are used for this package.</p>

Key Rotation	<p>This option is only applicable when "Package Based Key Rotation" is set to true.</p> <p>Select True to enable key rotation for retrieving a new encryption key per package.</p>
Key Change Period	<p>This option is only applicable when "Package Based Key Rotation" is set to true.</p> <p>This is the period of time the VOS will wait until it retrieves a new encryption key (expressed in seconds).</p>
SCTE-35 Segmentation Mode	<p>Options:</p> <ul style="list-style-type: none"> NBC: If the NBC mode is selected, the NBC SCTE-35 annotation will be enabled in the CMAF output.
SCTE-35 Default Auto-return Duration	<p>You can input the desired auto return timeout in seconds for VOS to automatically generate a splice-in SCTE-35 message according to the given timeout value.</p> <div style="border: 1px solid #f0e68c; padding: 10px; margin-top: 10px;"> <p>⚠ Note</p> <p>It is applied only if a splice-out SCTE-35 message is received and there is no corresponding splice-in SCTE-35 message received in the source before this timeout expires.</p> </div>
Common encryption scheme	<p>Options:</p> <ul style="list-style-type: none"> CENC_CBCS: If selected, the MPEG-CENC 'cbc3' protection scheme will be used for common encryption for CMAF packages. This is the default and recommended option. CENC_CENC: If selected, the MPEG-CENC 'cenc' protection scheme will be used for common encryption for CMAF packages.
Generate Segment Thumbnail	<p>If True is selected, thumbnail images will be generated for each leading IDR of the video segments. Thumbnail tracks are created for DASH manifest and HLS playlist when using CMAF Live packaging. The thumbnail image is generated from the highest bitrate segment and converted with the configured height in the JPG format.</p>

Segment Thumbnail Height	If Generate Segment Thumbnail is enabled, specify the height of the thumbnail image to be created (image width is determined by the aspect ratio of the video).
DASH Parameters	
MPD Filename	The name of Media Presentation Description (MPD, aka Manifest) file which is used to describe a media presentation and allows the players to access the CMAF-DASH service.
Minimum Update Period	This allows to indicate to the player about the minimum update frequency of the manifest. The value range is from 0 second to 31536000 seconds (1 year). '-1' is a special value, meaning "Auto" The default value is '-1'/'Auto' If MUP = -1/Auto, then the value is equal to min(audioSegmentLength,videoSegmentLength)
UTC Timing Scheme Id Uri	Allows better synchronization between CMAF-DASH server and client. Possible values are: <ul style="list-style-type: none"> • None (default) • urn:mpeg:dash:utc:http-xsdate:2014 • urn:mpeg:dash:utc:http-iso:2014 • urn:mpeg:dash:utc:http-ntp:2014 • urn:mpeg:dash:utc:ntp:2014 • urn:mpeg:dash:utc:http-head:2014
UTC Timing Value	If a timing scheme is set for UTC Timing Scheme Id Uri , then the URI of a time server supporting this scheme must be configured as "UTC Timing Value". It is recommended to use " urn:mpeg:dash:utc:http-iso:2014 " with the time server URL " http://time.akamai.com/?iso&ms ".
DAI Annotation Type	<p>Note</p> <p>The DAI Annotation Type is applicable only when the SCTE-35 Segmentation mode is enabled.</p> <p>If the NBC type is selected, the NBC DAI annotation will be applied to CMAF-DASH output.</p>

Teletext Subtitle Handling	Select from the drop-down list to handle the CMAF-DASH subtitle format(s) in which the Teletext subtitles will be converted. The current options are "To IMSC1" and "To WebVTT-fMP4". None , one or multiple selections are supported.
Closed Caption Handling	Select from the drop-down list to handle the CMAF-DASH subtitle format(s) in which the Closed-Caption (CEA-608/708) subtitles will be converted. The current options are "To IMSC1" and "To WebVTT-fMP4". None , one or multiple selections are supported.
Fill Gap Near Period Start	For some circumstances, the total length of audio can be shorter or longer than the total length of the video. If True is selected, the VOS packager will fill the gap near the start of the following period with the extra segment.
Use PTS As PTO	If True is selected, the package output will use the first Presentation Time Stamp (PTS) of audio as the Presentation Time Offset (PTO) of the audio adaptation set, so all video and audio will start at 0 of all Periods.
HLS Parameters	
Playlist Filename	The variant playlist lists the URLs of each variant stream to allow clients to switch between encodings dynamically. This setting specifies the file name of the variant playlist excluding file extension (i.e. .m3u8). For example, if this value is set to "master", the actual file name will be "master.m3u8". The default file name of the variant playlist is index.m3u8.
URL Order	Specify whether the playlist URLs are arranged based on ascending bitrate or descending bitrate.
Specify Starting Live Point	If True is selected, you need to specify the Starting Live Point.
Starting Live Point	You can specify a positive number that indicates a time offset from the beginning of the Playlist. In contrast, you can specify a negative number that indicates a negative time offset from the end of the last Media Segment in the Playlist.

Target Duration	This is used to set the target segment duration in the output stream playlist. The input value 0 means to follow the segment length.
DAI Annotation Type	<p>Note</p> <p>The DAI Annotation Type is applicable only when the SCTE-35 Segmentation mode is enabled.</p> <p>If the NBC type is selected, the NBC DAI annotation will be applied to the CMAF-HLS output.</p>
Display HDCP-LEVEL attribute	If True is selected, the HDCP-LEVEL attribute will be added in the master playlist.
Teletext Subtitle Handling	Select from the drop-down list to handle the CMAF-HLS subtitle format(s) in which the Teletext subtitles will be converted. The current options are "To IMSC1" and "To WebVTT". None, one or multiple selections are supported.
Closed Caption Handling	Select from the drop-down list to handle the CMAF-HLS subtitle format(s) in which the Closed-Caption (CEA-608/708) subtitles will be converted. The current options are "To IMSC1" and "To WebVTT". None, one or multiple selections are supported.

ATS parameters

Audio Carried With Video	<p>The following options are available:</p> <ul style="list-style-type: none"> • All: The ATS carries all audio streams intended to be used with the video representation • Top: Not in use at this time • Match: Not in use at this time
Data Carried With Video	<p>The following options are available:</p> <ul style="list-style-type: none"> • All: The ATS carries all data streams intended to be used with the video representation • Top: Not in use at this time

ATS Filter	Optionally, exclude profile output based on bit rate.
Encapsulation Mode	<p>The encapsulation mode used for the output (UDP/RTP). Increment by Port or Multicast address (SPTS only).</p> <ul style="list-style-type: none"> • Minimum increment is 1 with FEC disabled, or 3 with FEC enabled. • Maximum increment is 100. <p>Forward Error Correction (FEC) is only available with RTP encapsulation.</p> <ul style="list-style-type: none"> • FEC Row: Valid numbers are 4 through 20. • FEC Column: Valid numbers are 1 through 20. <p>Number of rows * number of columns cannot exceed 100.</p>

Thumbnail package parameters

The thumbnail packaging format is a standalone packaging type that can be used jointly with other packaging outputs by players, in order to offer content preview functionality to end-users for seeking. This allows players to display "visual cues" in the scrub bar and also to offer a kind of trick mode fully based on a web app (avoiding decoding video frames using an actual video player).

A thumbnail package is independent of existing OTT packaging formats for it to be sharable for multiple OTT package outputs with pull packaging. The thumbnails can be grouped as image sprites for static applications (Catch-Up, Long-Lasting Catch-Up and VOD), in order to reduce the number of downloads.

Thumbnail Interval	Configure the time interval for thumbnail extraction. It should be a multiple of the IDR period used for the ABR video profiles.
Thumbnail Height	Configure the height for the thumbnails. The thumbnail width will be determined according to the incoming video aspect ratio.
Thumbnail Filename Pattern	<p>VOS supports customizable pattern for the thumbnail filename:</p> <p>Thumbnail-%sequence</p> <p>%sequence refers to the sequence number of the media segment</p> <p>E.g. Thumbnail-394422532</p>

Thumbnail Image Format	Configure the image format in which the thumbnails will be encoded: JPG, PNG, or GIF format. The recommended format is JPG (best quality-size ratio).
WebVTT Filename Pattern	<p>The WebVTT file format is used to list the thumbnail images.</p> <p>VOS supports customizable pattern for the WebVTT filename:</p> <p>Segment-%sequence</p> <p>%sequence refers to the sequence number of the associated WebVTT segment (vtt format) in the playlist.</p> <p>E.g. Segment-394422532</p>
Playlist Filename	<p>This refers to the JSON playlist used to list the WebVTT files. The default playlist filename is index.json.</p> <p>For Live and Start-Over this JSON playlist is updated dynamically to add the new WebVTT files (as new thumbnails are extracted from live content and referenced in new WebVTT files).</p> <p>For Catch-Up, LLCU and VoD this JSON playlist is static.</p>
DVR Window Size	This refers to the control of the availability of thumbnail files most recently added to the Media Presentation Description file (expressed in seconds). The value range is from 60 seconds to 7200 seconds.
Segment Retention Period	The duration that the thumbnail files actually retain in the publishing server (expressed in minutes). The value range is from 1 minute to 120 minutes.

Fromlive Image Sprite Per Row

Note

This feature is applicable to Catch-up, Long-Lasting Catch-Up and VOD services only.

An image sprite is formed by grouping thumbnails together based on rows and columns.

The thumbnails are defined in this ordering, first row then column (Row-major ordering).

1	2	3
4	5	6

Configure how many thumbnails per row in an image sprite.

When image sprite is used, the suffix#xywh=x,y,w,h will be added to the thumbnail filename to indicate the coordinate of an individual thumbnail. The first two values (x,y) represent x, y coordinate from the top left corner of the thumbnail is an image sprite. The following two values (w,h) represent the width and height of the thumbnail.

Fromlive Image Sprite Per Column

Note

This feature is applicable to Catch-up, Long-Lasting Catch-Up and VOD services only.

An image sprite is formed by grouping thumbnails together based on rows and columns.

The thumbnails are defined in this ordering, first row then column (Row-major ordering).

1	2	3
4	5	6

Configure how many thumbnails per column in an image sprite.

When image sprite is used, the suffix#xywh=x,y,w,h will be added to the thumbnail filename to indicate the coordinate of an individual thumbnail. The first two values (x,y) represent x, y coordinate from the top left corner of the thumbnail is an image sprite. The following two values (w,h) represent the width and height of the thumbnail.

RTMP package parameters

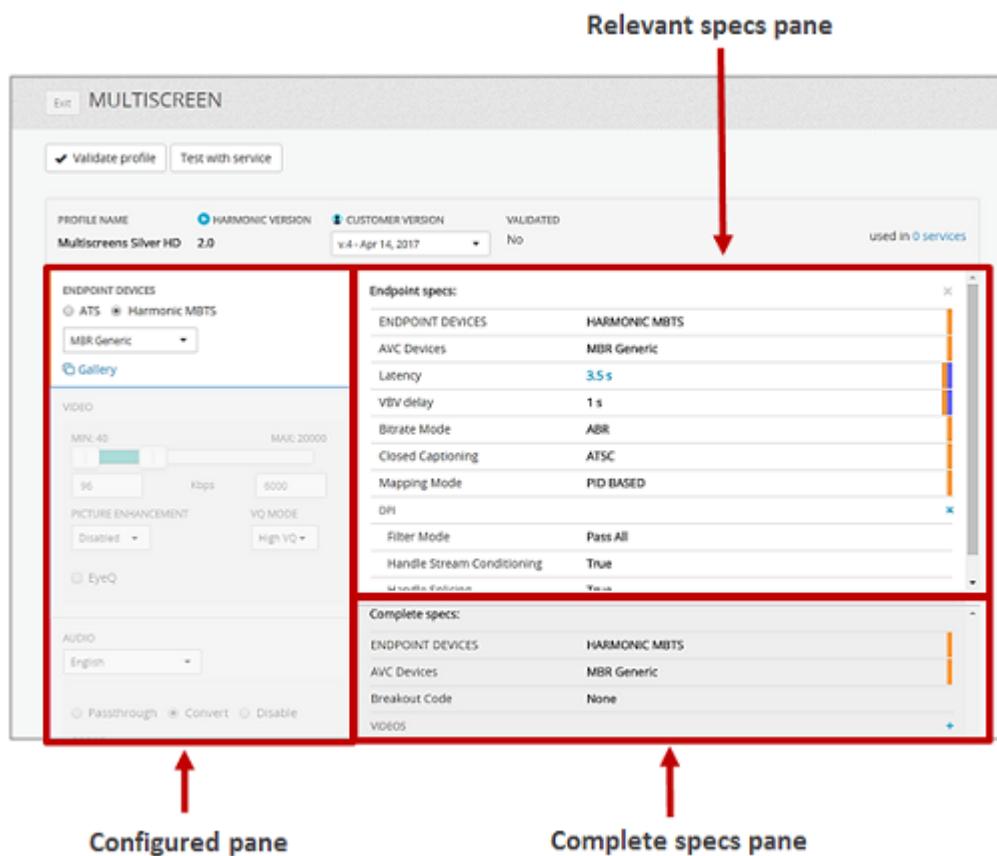
Reconnection Interval	Timeout for automatic reconnection in case the connection is interrupted.
Late Binding Audio	<p>This parameter specifies how streams are created and named.</p> <p>For example in the case of multi-profile, with 3 videos (V1; V2; V3) and 2 audios (A1; A2):</p> <ul style="list-style-type: none"> • If LBA = false, then created streams are: V1_A1; V2_A1; V3_A1; A2 • If LBA = true, then created streams are: V1; V2; V3; A1; A2 <div style="border: 1px solid #fca; padding: 10px; margin-top: 10px;"> <p>⚠ Note</p> <p>Whatever the LBA mode and the other settings, there can be only "1 video", "1 audio" or "1 video + 1 audio" per TCP connection.</p> </div>
User Agent	<p>This allows the server to identify the client which is originating the connection request, based on the 'flashVer' property. The default value is Harmonic.</p> <div style="border: 1px solid #fca; padding: 10px; margin-top: 10px;"> <p>⚠ Note</p> <p>You might have to change it if the remote server accepts only a limited set of user agents</p> </div>
Publish Single Video Profile	This option allows users to select a video profile (based on bitrate) and an audio profile (based on language and bitrate) and publish the RTMP stream to the social media platform. When True is selected, three "PSVP" parameters will be shown.

PSVP - Video Max Bit Rate	<p>This option is only applicable when "Publish Single Video Profile" is set to true.</p> <p>Configure the maximum bitrate that the video profile will be selected with the highest bitrate below the configured maximum bitrate. If the max bitrate is below the lowest bitrate, the lowest bitrate will be selected, i.e. there will always be a video available.</p> <div style="border: 1px solid #f0e68c; padding: 10px; margin-top: 10px;"> <p>⚠ Note</p> <p>If you desire to select the highest bit rate, a very high value (max is 100 Mbps) must be entered.</p> </div>
PSVP- Audio language	<p>This option is only applicable when "Publish Single Video Profile" is set to true.</p> <p>Select one item from a drop-down list:</p> <ul style="list-style-type: none"> • Default: <ul style="list-style-type: none"> • If selected the audio language is the one selected in the configure source audio grooming. • If audio grooming has no default language selected, an arbitrary language is selected. • All: <ul style="list-style-type: none"> • All languages are selected. • A language selected from the 'languages list': <ul style="list-style-type: none"> • The language list comes from the 'Configure Channels' settings, where video languages are listed. • If the selected language is not part of groomed audio languages, one language is automatically selected, thus avoiding no language selection at all.
PSVP - Audio Max Bit Rate	<p>This option is only applicable when "Publish Single Video Profile" is set to true.</p> <p>Configure the maximum bitrate that the audio profile will be selected with the highest bitrate below the configured maximum bitrate, for the selected language.</p> <div style="border: 1px solid #f0e68c; padding: 10px; margin-top: 10px;"> <p>⚠ Note</p> <p>If you desire to select the highest bit rate, a very high value (max is 1 Mbps) must be entered.</p> </div>

Modifying a profile

Modify a profile's configuration using the **Profile Editor**.

Lab Wizard Profile Editor



⚠ Note

If you must modify a default profile, Harmonic recommends changing the settings in the **Configured** pane only.

- From the Lab Wizard app, click the profile panel to open the **Profile Editor**.
- From the **Configured** pane, make any necessary changes.
Additional settings appear in the **Relevant Specs** pane.
- If the **Customize Specs** dialog box opens, do one of the following:
 - To continue editing, click **Yes, Override to Manual Mode**. **Manual mode** enables you to override the profile's default settings.
 - To cancel editing and revert to the default settings, click **No, Keep Parametric Mode**. **Parametric mode** maintains the default settings configured by Harmonic.
- Optionally, enter a brief description of the profile changes.
- Click **Save as Version**.

⚠ Note

After a profile has been updated, you cannot revert your changes.

Result: On the **Profile panel**, the **Customer Version Number** increments by 1.

What to do next

Modified profiles need to be validated.

Related information

- [Updating from a master profile version](#)
- [Creating an Origin/CDN destination profile](#)
- [Creating an IPTV destination profile](#)
- [Creating an ATS destination profile](#)
- [Updating a profile with the REST API](#)
- [Creating a new profile using old profile version with the REST API](#)

Updating from a master profile version

The Lab Wizard app alerts you when a new master profile version has been released. You can update a profile to the *latest* released master profile version only.

Note

If VOS update required appears on the **Profile Panel**, then you must upgrade the VOS Cloud-Native Software before you can install the latest released profile version.

1. Click the **Profile Panel** for the profile to be updated.
2. Click **Update from Master Profile** and then click **Yes** to confirm.
3. Click the **Exit** button to return to the **Profiles** page.

What to do next

Test and validate the new profile version.

Creating an Origin/CDN destination profile

You must modify a Harmonic destination profile to create a profile that supports push and/or pull packaging for Origin/CDN delivery. This workflow uses the Destination Multiscreen profile from the Lab Wizard app.

1. Navigate to the **Lab Wizard** app > **Profiles** tab and click **Destination** to display only destination profiles.
2. Click the Destination Multiscreen profile panel to open the **Profile Editor**.
3. Below **Packages**, add or remove packaging output as desired.

Tip

You may add multiple packages of the same package type to the destination profile.

i Info

Each destination profile supports up to 10 package outputs.

- To edit the specifications for each package output, click a package output and then modify the settings in the **Complete Specs** pane as needed.

i Info

The maximum length of the **Package Name** is 10 characters. Only one package output per package type is allowed to not have a package name (i.e. **Package Name**=none); in this case the type of package (DASH, HLS, CMAF, RTMP) is used as default name.

⚠ Note

NOTE: For each package output created, if encryption is not needed, ensure that you set **Encryption Method** to **Clear**.

Note the following recommendations:

Packaging type	Specifications
DASH	Set Video Segment Length and Audio Segment Length to 2 seconds.
HLS	Set Segment Length to 6 seconds (as recommended by Apple).
MSS	Set Video Segment Length and Audio Segment Length to 2 seconds.

- To enable **Pull Packaging**, toggle the selector to the **On** position and then set the duration of the from-live buffer:
 - To perform live packaging only (no time-shifting, catchup, or nPVR), then leave the **Recording/Buffer Time** time set to **0**.
 - To use time-shifting, catchup, or nPVR, set the desired **Recording/Buffer Time** on the slider. The **specify duration in minutes** option allows you to set a custom duration.
 - The **Nielsen RTVOD Flag** drop-down menu will be enabled. You can configure the RTVOD flag which will be inserted into existing Nielsen watermarks of the stream as an additional measurement point. The options are None/Auto/C3/C7 and the default value is None.
- To enable **Push Packaging**, toggle the selector to the **On** position.
- To enable **OTT Watermarking**, toggle the selector to the **On** position.

- For DASH and HLS destination profiles, the **Alt Watermarking Output Prefix** field will appear for configuration if this OTT Watermarking is enabled. (Refer to [Destination profile parameters](#) for details.)
- To configure an OTT Watermarking packaging service, you can navigate to the **Sources** tab from the Configure Channels app to add the watermark. (Refer to [Configuring an IP source input](#) for details.)

8. Configure the **Packager Clock**:

- **System Wall-Clock**: If selected, the package output will be based on the system wall-clock times.
 - **Source Timecodes**: If selected, the package output will be based on the timecodes from the source (included in the "picture timing SEI" messages of the video elementary stream).
- This setting applies to all the package outputs of the same destination profile.

Note

For an HLS package output, this setting is used to configure what time reference is used for the timestamps associated to the "X-PROGRAM-DATE-TIME" tag (based on the system wall-clock or source timecodes). This is also with geo-redundancy supported. For a DASH package output, this setting is used to configure what time reference is used for the Producer Reference Time (PRFT) timestamps, when PRFT insertion is enabled. (Refer to "Insert ProducerReferenceTime to Manifest" in [Destination profile parameters](#) for details.) This is also with geo-redundancy supported.

9. To enable **Mute Output On Signal Loss**, toggle the selector to the **On** position.

10. Enter a brief description of the profile changes, and then click **Save as Version**.

Note

After a profile has been updated, you cannot revert your changes.

Result: On the **Profile panel**, the **Customer Version Number** increments by 1.

What to do next

You must validate the new profile before you can apply it to a service.

Related information

[Configuring a multiscreen/origin service](#)

[Configuring a packaging-only service](#)

Creating an IPTV destination profile

If necessary, modify the Harmonic master IPTV destination profile as required by your IPTV system.

1. Navigate to the **Lab Wizard** app > **Profiles** tab and click **Destination** to display only destination profiles.
2. Click the desired IPTV profile to open the **Profile Editor**.
3. Optionally, type a new **Profile Name**.
4. If the transcoding profile supports PIP, choose from SPTS/MPTS for **Picture in Picture Mode**.

5. To enable **Mute Output On Signal Loss**, toggle the selector to the **On** position.
6. Select the protocol to be used for **Encapsulation Mode**.
7. If you selected RTP in the previous step then, optionally, enable and configure FEC settings.
8. Enter a brief description of the profile changes, and then click **Save as Version**.

⚠ Note

After a profile has been updated, you cannot revert your changes.

Result: On the **Profile panel**, the **Customer Version Number** increments by 1.

What to do next

You must validate the new profile before you can apply it to a destination.

Related information

[Validating a profile](#)

Creating an ATS destination profile

You can modify the Harmonic default profile to meet your ATS output requirements.

1. Navigate to the **Lab Wizard** app > **Profiles** tab and click **Destination** to display only destination profiles.
2. Click the desired ATS profile to open the **Profile Editor**.
3. Optionally, type a new **Profile Name**.
4. If audio is present, ensure that **Audio Carried with Video** is set to **All**.
The ATS carries all audio streams intended to be used with the video representation. This is the only option supported at this time.
5. If data is present, ensure that **Data Carried with Video** is set to **All**.
The ATS carries all data streams intended to be used with the video representation. This is the only option supported at this time.
6. Select the protocol to be used for **Encapsulation Mode**.
UDP and RTP are supported. RTP is required for Forward Error Correction (FEC) support.
7. If you selected RTP in the previous step then, optionally, enable and configure FEC settings.
 - **FEC Row**: Valid numbers are 4 through 20.
 - **FEC Column**: Valid numbers are 1 through 20.
Note that number of rows * number of columns cannot exceed 100.
8. Enter a brief description of the profile changes, and then click **Save as Version**.

⚠ After a profile has been updated, you cannot revert your changes.

Result: On the **Profile panel**, the **Customer Version Number** increments by 1.

What to do next

You must validate the new profile before you can apply it to a destination.

Related information

[ATS profile parameters](#)

Validating a profile

Updating a profile with the REST API

You may update the profiles from Lab Wizard using VOS REST API.

Note

You are recommended to update the profile using the Lab Wizard app from the VOS UI instead of VOS REST API as the Lab Wizard app provides a manageable workflow for users to configure.

1. From the **Lab Wizard** app, examine the Profile Name and Version Number of the Profile that you wish to update.
2. Navigate to the **DevOps Portal** app > **Developer API**.
3. Under **LabWizard**, navigate to **GET/labwizard/v1/profiles**, click **Try it out!**.
4. Specify the Profile Name in the field **Filter By Profile Name** to find out the ID number of the Profile you wish to update.
5. Navigate to **GET/labwizard/v1/profiles/(id)**, click **Try it out!**.
6. In the **Response Body**, extract the Profile parameters (JSON) from the command.
7. Update the Profile parameters (JSON):
 - a. Update the information.
 - b. Delete the "id".
 - c. Increment "customerVersion" by one.
8. Navigate to **POST/labwizard/v1/profiles**, click **Try it out!**.
9. Place the updated Profile parameters (JSON) to the body.
10. Click **Execute**.

Result: A new version of profile is created with updated profile information.

Creating a new profile using old profile version with the REST API

You may need to create a new profile from Lab Wizard using VOS REST API if you are required to reuse the older version of a profile.

1. From the **Lab Wizard** app, examine the Profile Name and Customer Version of the Profile that you wish to use for the new profile.
2. Navigate to the **DevOps Portal** app > **Developer API**.
3. Under **LabWizard**, navigate to **GET/labwizard/v1/profiles**, click **Try it out!**.
4. Specify the Profile Name in the field **Filter By Profile Name** to find out the ID number of the Profile so you can copy the information to the new profile.
5. Navigate to **GET/labwizard/v1/profiles/(id)**, click **Try it out!**.

6. In the **Response Body**, extract the Profile parameters (JSON) from the command for the desired "customerVersion" with "id".
7. Update the Profile parameters (JSON):
 - **name**: Specify a Profile name for the new profile.
 - **id**: Remove the existing "id" as this is the unique ID for the profile. The profile ID will be automatically generated for the new profile.
 - **customerVersion**: Set the "customerVersion" to 1 for the new profile.
8. Navigate to **POST/labwizard/v1/profiles**, click **Try it out!**.
9. Place the updated Profile parameters (JSON) to the body.
10. Click **Execute**.

Result: A new profile is created with information from the old profile version.

Validating a profile

Validation ensures that only the approved profiles can be used in creating and updating services.

Only Super Admins have the rights to validate profiles. After new/updated profile is validated a new/latest version will be created for new services. The running services continue using the old profile version unless profiles are actively updated through the Versions app.

If a profile has not been validated, then Not validated is displayed on the **Profile Panel**.

1. From the **Profiles** page, click the panel for the profile to be validated.
2. Click **Validate Profile** and then click **Yes** to confirm.

⚠ Note

You cannot rollback the validation process and revert to a previous version of a profile.

What to do next

Navigate to the Versions app to commit the new profile version to affected services.

Committing an updated profile version to affected services

An updated profile version becomes available when either of the following occurs:

- The customer validates a new profile version
- The VOS Runtime has been updated to a new system bundle, which supports a new Harmonic profile version

A service will continue to use an older profile version until you manually apply a new profile version to it. There is no need to restart the service after you commit the new profile version.

1. From the Versions app, click the **Profiles** tab.

Result: Updated profiles are displayed on the left.

2. Select the updated profile that you would like to commit.
- Result:** On the right, those services using the previous version of the profile appear.
3. Optionally, click **Changelog** to review the changes that have been made to the profile.
4. Click **Commit** to apply the profile version to a particular service, or click **Commit all selected** to apply the profile version to all affected services.

⚠️ Important

There will be a brief service interruption while the system performs the update.

5. For services that are on rolling upgrades, verify the new service and then finalize the commit.

Viewing a profile changelog

The profile changelog tracks all profile modifications, including updates and validations, and is useful if problems occur after a profile has been modified.

1. From the Versions app, click the **History** tab.
2. Click **Profiles**, and then select a **Profile update** to view the changes made to that profile.

OTT track filters (DRM track filters)

- [Configuring multi-key encryption and OTT track filters \(DRM track filters\)](#)
- [Filtering packaged profiles per packaging output for VOD and LLCU](#)
- [Filtering packaged profiles per packaging output for Live, Start-over and Catch-up](#)

Configuring multi-key encryption and OTT track filters (DRM track filters)

Multi-key encryption is used to apply different DRM licensing parameters to different video profiles and audio variants. It can, for instance, be used to protect UHD/HD video profiles with high-end security (hardware decryption, HDCP 2.2), and protect SD video profiles and audio with mid/low-end security (SW decryption, HDCP 2.1).

In order to associate specific video profiles and audio variants to different encryption keys, "DRM track filters" are used. Each group of video profiles and audio variants that must be protected with the same key are associated with a single "track type". This track type is a value pre-defined in the DRM system and which is associated with specific security rules (the security rules are only enforced in the licensing process between the DRM license server and the client/player, i.e. not during the encryption process). Before encrypting the content, the packager sends a key request to the KMS server (part of the DRM system) which includes the list of track type; the KMS must then provide for each track type a specific key (and associated DRM signalling) in the key response.

The DRM track filter profiles must first be created or updated using Lab Wizard UI or the API. They can then be associated to live services (live, start-over, catch-up) or on-demand content (nPVR, VOD). The use of a DRM track filter is optional; if not used then a single key is used to encrypt all the video profiles and audio variants.

Note

Multi-key encryption is only supported when using "Widevine KMS API" or "CPIX KMS API". (Both APIs support the concept of "track type")

To modify the DRM Track Filter parameters, navigate to **Lab Wizard** app > **OTT Filters** and refer to the descriptions and examples below for DRM Track Filter details.

For DRM Track Filter configurations, refer to [Configuring DRM using Harmonic CPIX](#) and [Configuring service add-ons](#) (DRM-add-on).

DRM Track Filter parameters

trackType	<p>Text string used as an identifier of the track type, as pre-defined in the DRM system. For instance: AUDIO, SD, HD, UHD1, UHD2...</p>
clearOutput	<p>This is used to disable encryption for the desired 'trackType'. You can for instance decide to encrypt the video profiles, but not the audio variants.</p>
videoStreamSelections	<p>Each 'DRM Track' filter set is made of several 'Track Type' filters, that define a rule based on audio or video characteristics (audioStreamSelections and videoStreamSelections) so that it is possible for a multiscreen profile to recognize which profile corresponds to that 'Track Type' filter.</p>
audioStreamSelections	<p>An empty filter without audioStreamSelections nor videoStreamSelections elements can be created to be used as a default filter. It can be used to make sure all Audio/Video profile/track will be associated to a track type. It is also applicable in case the same trackType must be applied to all Audio/Video tracks. Otherwise, if the profile is not associated to a track type, it is not available.</p> <p>Part of the audioStreamSelections or videoStreamSelections element can be set to null if unused.</p> <p>The following selection criteria are supported:</p> <ul style="list-style-type: none"> • Video resolution (Frame size is used without considering the pixel aspect ratio, it may be slightly different from the HLS master playlist displayed resolution value) • Video bitrate (ES bitrate is used, it is slightly different from the bitrate shown in the HLS TS playlist) • Video codec (H_264, H_265, ALL) • Video framerate • Audio bitrate • Audio codec (AAC_LC, HE_AAC_V1, HE_AAC_V2, AC_3, E_AC_3, ALL)

Related information

[Examples of Harmonic CPIX DRM with multiple keys for different DRM track filtering profiles](#)

Examples of Harmonic CPIX DRM with multiple keys for different DRM track filtering profiles

You can create a DRM track filtering profile with the Harmonic CPIX DRM in order to define multiple encryption keys for different audio/video track types.

- Audio and video tracks are encrypted with two separate keys
- Audio and HD video tracks are encrypted, all other video tracks are clear
- Video tracks are encrypted, audio tracks are clear
- Different video (SD, HD, UHD) tracks are encrypted with different keys, audio tracks are encrypted, without default track

Audio and video tracks are encrypted with two separate keys

DRM track filtering profile. Audio and video tracks are encrypted with two separate keys.

```
{
  "name": "HarmonicCpixTrackFilter",
  "drmTrackFilterProperties": [
    {
      "name": "Harmonic cpix audio track",
      "trackType": "AUDIO",
      "clearOutput": false,
      "videoStreamSelections": null,
      "audioStreamSelections": [
        {
          "withAudioGain": null,
          "audioCodecSelection": "ALL",
          "bitrateRange": null,
          "audioLanguageSelections": null
        }
      ]
    },
    {
      "name": "Harmonic cpix video track",
      "trackType": "VIDEO",
      "clearOutput": false,
      "videoStreamSelections": null,
      "audioStreamSelections": null
    }
  ]
}
```

Audio and HD video tracks are encrypted, all other video tracks are clear

DRM track filtering profile. Audio and HD video tracks are encrypted, all other video tracks are clear.

```
{
  "name": "HarmonicCpixTrackFilter",
  "drmTrackFilterProperties": [
    {
      "name": "Harmonic cpix audio track",
      "trackType": "AUDIO",
      "clearOutput": false,
      "videoStreamSelections": null,
      "audioStreamSelections": [
        {
          "withAudioGain": null,
          "audioCodecSelection": "ALL",
          "bitrateRange": null,
          "audioLanguageSelections": null
        }
      ]
    },
    {
      "name": "Harmonic cpix HD track",
      "trackType": "HD",
      "clearOutput": false,
      "videoStreamSelections": [
        {
          "videoCodecSelection": "ALL",
          "frameRateRange": {
            "minFrameRate": 0,
            "maxFrameRate": 60
          },
          "horizontalResolutionRange": {
            "minHorizontalResolution": 721,
            "maxHorizontalResolution": 1920,
            "minHorizaontalResolution": 0,
            "maxHorizaontalResolution": 0
          },
          "verticalResolutionRange": {
            "minVerticalResolution": 577,
            "maxVerticalResolution": 1080
          },
          "bitrateRange": null
        }
      ],
      "audioStreamSelections": null
    },
    {
      "name": "Harmonic cpix default track",
      "trackType": "VIDEO",
      "clearOutput": true
    }
  ]
}
```

```

        "clearOutput":true,
        "videoStreamSelections":null,
        "audioStreamSelections":null
    }
]
}

```

Video tracks are encrypted, audio tracks are clear

DRM track filtering profile. Video tracks are encrypted, audio tracks are clear.

```
{
  "name":"HarmonicCpixTrackFilter",
  "drmTrackFilterProperties":[
    {
      "name":"Harmonic cpix audio track",
      "trackType":"AUDIO",
      "clearOutput":true,
      "videoStreamSelections":null,
      "audioStreamSelections":[
        {
          "withAudioGain":null,
          "audioCodecSelection":"ALL",
          "bitrateRange":null,
          "audioLanguageSelections":null
        }
      ]
    },
    {
      "name":"Harmonic cpix video track",
      "trackType":"VIDEO",
      "clearOutput":false,
      "videoStreamSelections":null,
      "audioStreamSelections":null
    }
  ]
}
```

Different video (SD, HD, UHD) tracks are encrypted with different keys, audio tracks are encrypted, without default track

DRM track filtering profile.Different video (SD, HD, UHD) tracks are encrypted with different keys, audio tracks are encrypted, without default track.

```
{
```

```
"name":"HarmonicCpixTrackFilter",
"drmTrackFilterProperties": [
    {
        "name":"Harmonic cpix audio track",
        "trackType":"AUDIO",
        "clearOutput":false,
        "videoStreamSelections":null,
        "audioStreamSelections": [
            {
                "withAudioGain":null,
                "audioCodecSelection":"ALL",
                "bitrateRange":null,
                "audioLanguageSelections":null
            }
        ]
    },
    {
        "name":"Harmonic cpix SD track",
        "trackType":"SD",
        "clearOutput":false,
        "videoStreamSelections": [
            {
                "videoCodecSelection":"ALL",
                "frameRateRange": {
                    "minFrameRate":0,
                    "maxFrameRate":30
                },
                "horizontalResolutionRange": {
                    "minHorizontalResolution":0,
                    "maxHorizontalResolution":720
                },
                "verticalResolutionRange": {
                    "minVerticalResolution":0,
                    "maxVerticalResolution":576
                },
                "bitrateRange":null
            }
        ],
        "audioStreamSelections":null
    },
    {
        "name":"Harmonic cpix HD track",
        "trackType":"HD",
        "clearOutput":false,
        "videoStreamSelections": [
            {
                "videoCodecSelection":"ALL",
                "frameRateRange": {
                    "minFrameRate":0,
                    "maxFrameRate":60
                },
                "horizontalResolutionRange": {
                    "minHorizontalResolution":721,
```

```

        "maxHorizontalResolution":1920,
        "minHorizaontalResolution":0,
        "maxHorizaontalResolution":0
    },
    "verticalResolutionRange":{
        "minVerticalResolution":577,
        "maxVerticalResolution":1080
    },
    "bitrateRange":null
}
],
"audioStreamSelections":null
},
{
    "name":"Harmonic cpix UHD (4K, 8K) track",
    "trackType":"UHD",
    "clearOutput":false,
    "videoStreamSelections":[
        {
            "videoCodecSelection":"ALL",
            "frameRateRange":{
                "minFrameRate":0,
                "maxFrameRate":60
            },
            "horizontalResolutionRange":{
                "minHorizontalResolution":1921,
                "maxHorizontalResolution":7680
            },
            "verticalResolutionRange":{
                "minVerticalResolution":1081,
                "maxVerticalResolution":4120
            },
            "bitrateRange":null
        }
    ],
    "audioStreamSelections":null
}
]
}

```

Filtering packaged profiles per packaging output for VOD and LLCU

You can filter the video and audio profiles per package for VOD and Long-Lasting Catch-Up (LLCU) services, and control which profiles are presented in the manifest/playlist and downloadable.

Filtered out streams are not downloadable: in case of request for excluded profiles, the Origin returns HTTP 404 errors for filtered segment requests and HTTP 503 errors for filtered HLS media playlist requests.

The configuration is per package. If no input stream selection filter is configured for one package, then all the source profiles are available for this package.

The following selection criteria are supported:

- Video resolution (Frame size is used without consider the pixel aspect ratio, it maybe slightly different from the HLS master playlist displayed resolution value)
- Video bitrate (ES bitrate is used, it is slightly different from the bitrate shown in HLS TS playlist)
- Video codec (H_264, H_265, ALL)
- Video framerate
- Audio bitrate
- Audio codec (AAC_LC, HE_AAC_V1, HE_AAC_V2, AC_3, E_AC_3, ALL)

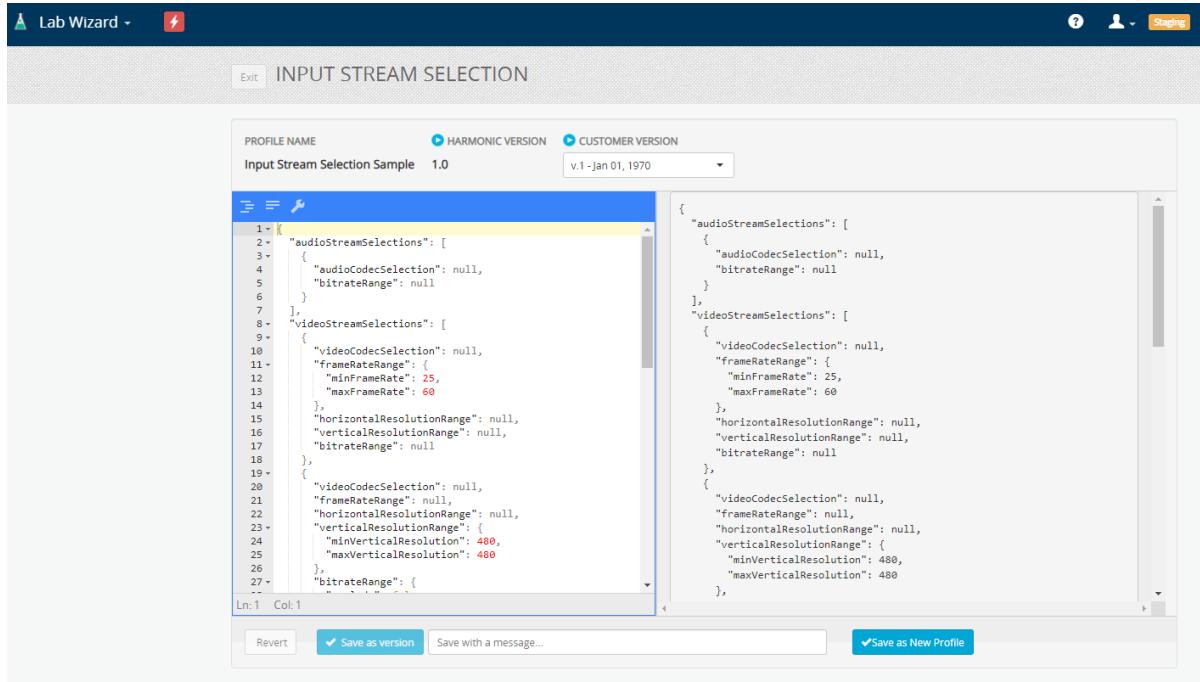
Note

All the sub-filters are whitelist selection: a stream must match all the sub-filters in order to be selected. An "exclude" flag is also available only for bitrateRange.

Configuration of the filtering:

1. Navigate to the **OTT Filters** tile in the **Lab Wizard** app.
2. Modify and/or clone an existing Input Stream Selection profile through the app UI or create/modify one through the REST API.

Lab Wizard app UI example:



REST API example:

Sample Input Stream Selection Profile

```
{  
    "version": "",  
    "creationTime": null,  
    "lastUpdatedTime": null,  
    "id": "6062b10b-327b-427c-b12f-0355672b8a93",  
    "name": "Sample Input Stream Selection",  
    "type": "e_INPUT_STREAM_SELECTION",  
    "minRequiredVosBundleVersion": "",  
    "harmonicVersion": "1.0",  
    "customerVersion": null,  
    "validateTime": null,  
    "validated": true,  
    "masterId": "6062b10b-327b-427c-b12f-0355672b8a93",  
    "isTemplate": false,  
    "isReadonly": null,  
    "isCustomized": true,  
    "stbProfileProperties": null,  
    "ottStbProfileProperties": null,  
    "iptvProfileProperties": null,  
    "multiscreenProfileProperties": null,  
    "mptsProfileProperties": null,  
    "broadcastCBRProfileProperties": null,  
    "destinationProfileProperties": null,  
    "iptvDestinationProfileProperties": null,  
    "atsDestinationProfileProperties": null,  
    "mptsDestinationProfileProperties": null,  
    "fileTranscodingProfileProperties": null,  
    "manipulationProfileProperties": null,  
    "inputStreamSelectionProfileProperties": {  
        "audioStreamSelections": [  
            {  
                "audioCodecSelection": null,  
                "bitrateRange": null  
            }  
        ],  
        "videoStreamSelections": [  
            {  
                "videoCodecSelection": null,  
                "frameRateRange": {  
                    "minFrameRate": 25,  
                    "maxFrameRate": 60  
                },  
                "horizontalResolutionRange": null,  
                "verticalResolutionRange": null,  
                "bitrateRange": null  
            },  
            {  
                "videoCodecSelection": null,  
                "frameRateRange": null,  
                "horizontalResolutionRange": null,  
                "verticalResolutionRange": null  
            }  
        ]  
    }  
}
```

```
"horizontalResolutionRange": null,
"verticalResolutionRange": {
    "minVerticalResolution": 480,
    "maxVerticalResolution": 480
},
"bitrateRange": {
    "exclude": false,
    "esBitrateRange": {
        "minBitrateInbps": 0,
        "maxBitrateInbps": 1800000
    }
}
},
{
    "videoCodecSelection": null,
    "frameRateRange": null,
    "horizontalResolutionRange": null,
    "verticalResolutionRange": {
        "minVerticalResolution": 720,
        "maxVerticalResolution": 720
    },
    "bitrateRange": {
        "exclude": true,
        "esBitrateRange": {
            "minBitrateInbps": 0,
            "maxBitrateInbps": 2500000
        }
    }
},
{
    "videoCodecSelection": null,
    "frameRateRange": null,
    "horizontalResolutionRange": {
        "minHorizontalResolution": 1920,
        "maxHorizontalResolution": 1920
    },
    "verticalResolutionRange": {
        "minVerticalResolution": 1080,
        "maxVerticalResolution": 1080
    },
    "bitrateRange": {
        "exclude": false,
        "esBitrateRange": {
            "minBitrateInbps": 0,
            "maxBitrateInbps": 900000
        }
    }
}
],
},
"drmTrackFilterProfileProperties": null,
"pureOttLayoutProfileProperties": null,
"processingRequirementProperties": null,
```

```

    "hlsGroupingProfileProperties": null,
    "mmsTranscodeRequirements": null
}
```

- Set the inputStreamSelectionProfileId per package via PUT /vos-api/origin-engine/v1/vod/profile.

Example:

Sample VOD profile

```
{
  "cacheMaxAge": 10800,
  "hlsPackages": [
    {
      "packagePublishingName": "HLS",
      "encryptionConfig": null,
      "scte35Signaling": null,
      "segmentLengthInSeconds": 10,
      "dvrWindowSizeInSeconds": 120,
      "generateAudioOnlyStream": false,
      "generateIFrameOnlyPlaylist": false,
      "version": 3,
      "defaultAudioPid": 0,
      "useCmaf": false,
      "passThroughParameterSets": false,
      "teletextHandling": "e_TO_WEBVTT",
      "dvbSubtitleHandling": null,
      "scte35DefaultAutoReturnDuration": 30,
      "preemptiveVideoIndex": 0,
      "variantPlaylistSortDescendingly": false,
      "variantPlaylistEnableCodecsAttribute": false,
      "enablePlaylistTypeEventTag": false,
      "enableAverageBandwidthAttribute": false,
      "displayHdcpLevelAttribute": false,
      "scte35AnnotationTag": null,
      "targetDuration": 0,
      "indexPlaylistEnableRichSegmentUriInfo": false,
      "floatingPointDurationInPlaylistEnabled": true,
      "masterPlaylistName": "index",
      "absoluteMasterPlaylistName": "index-abs",
      "firstSegmentProgramDateTime": false,
      "hlsGroupingProfile": null,
      "enableCcDeclaration": false,
      "inputStreamSelectionProfileId": "d639bf08-2dc4-429f-a7ac-803863f22eb2"
    }
  ],
  "dashPackages": [
    {
      "packagePublishingName": "DASH",
      "encryptionConfig": null,
      "scte35Signaling": "e_NBC",
      "videoSegmentLength": 4,
      "dashManifestType": "mpd"
    }
  ]
}
```

```
"audioSegmentLength": 4,
"minimumUpdatePeriod": -1,
"manifestName": "manifest",
"enableOutputWebvtt": false,
"enableOutputTtml": false,
"closedCaptionHandling": null,
"dvbSubtitleHandling": null,
"teletextHandling": null,
"videoSegmentLengthInMillisecond": 0,
"audioSegmentLengthInMillisecond": 0,
"forceZeroBasePtsMapping": true,
"forceNonNegativeCto": false,
"decodeTimeShiftToPlaytime": false,
"forcePTOZero": false,
"playTimeStartFromZero": false,
"utcTimingSchemeIdUri": null,
"utcTimingValue": null,
"segmentLengthInMillisecond": 0,
"passThroughParameterSets": false,
"insertDefaultKIDToManifest": false,
"scte35CIDPassthrough": false,
"scte35DefaultAutoReturnDuration": 30,
"enableChunkedCMAF": false,
"suggestedPresentationDelayMode": null,
"suggestedPresentationDelayInMSec": -1,
"inputStreamSelectionProfileId": "40d30036-e8b2-45d2-94cf-df19d8c2e443"
},
],
"ssPackages": [
{
"packagePublishingName": "SS",
"encryptionConfig": null,
"scte35Signaling": null,
"videoSegmentLength": 4,
"audioSegmentLength": 4,
"videoSegmentLengthInMillisecond": 0,
"audioSegmentLengthInMillisecond": 0,
"languageCodeLetterCase": "e_ALL_CAPITALS",
"useRepeatAttribute": false,
"enableHEVCCCodec": true,
"inputStreamSelectionProfileId": null
},
],
"tsPackages": [
{
"packagePublishingName": "TS",
"encryptionConfig": null,
"scte35Signaling": null,
"segmentLengthInSeconds": 10
},
],
"cmafPackages": [
{
```

```

    "packagePublishingName": "CMAF",
    "encryptionConfig": null,
    "scte35Signaling": null,
    "dvrWindowSize": 120,
    "segmentLengthInMillisecond": 4000,
    "segmentRetentionPeriod": 600,
    "scte35SegmentationMode": "e_NBC",
    "segmentFileExtension": "e_M4V_M4A",
    "manifestName": "manifest",
    "masterPlaylistName": "index",
    "displayHdcpLevelAttribute": false,
    "hlsAnnotationType": null,
    "dashAnnotationType": "e_NBC",
    "scte35AnnotationTag": null,
    "scte35DefaultAutoReturnDuration": 30,
    "manipulationProfileId": "b8af47cb-10b5-4835-bfbf-65b9ef790b4e"
  }
],
"thumbnailPackages": [
  {
    "packagePublishingName": "THUMBNAIL",
    "encryptionConfig": null,
    "scte35Signaling": null,
    "thumbnailInterval": 4000,
    "thumbnailHeight": 720,
    "imageFormat": "e_JPG",
    "dvrWindowSize": 120,
    "segmentRetentionPeriod": 300,
    "imageSpriteInRow": 1,
    "imageSpriteInColumn": 1
  }
]
}

```

Filtering packaged profiles per packaging output for Live, Start-over and Catch-up

You can filter the video and audio profiles per package for Live, Start-over, and Catch-up services and control which profiles are presented in the manifest/playlist and downloadable.

The filtered-out streams are not downloadable: in case of a request for excluded profiles, the Origin returns HTTP 404 errors for filtered segment requests and HTTP 503 errors for filtered HLS media playlist requests.

The configuration is per package. If no input stream selection filter is configured for one package, then all the source profiles are available for this package.

The following selection criteria are supported:

- Video resolution
 - Frame size is used without considering the pixel aspect ratio

⚠ Note

It might be slightly different from the HLS master playlist displayed resolution value due to HLS specification constraints

- Video bitrate
 - ES bitrate is used

⚠ Note

It is slightly different from the bitrate shown in the HLS TS playlist, which includes some overheads (TS headers...)

- Video codec (H_264, H_265, ALL)
- Video framerate
- Audio bitrate
- Audio codec (AAC_LC, HE_AAC_V1, HE_AAC_V2, AC_3, E_AC_3, ALL)
- Audio language
 - Configuration
 - You can define a list of language codes corresponding to audio tracks that you want to keep for each package output.
 - The language codes are ISO-639-2 language codes (3 characters string, bibliographic/B or terminological/T version). For example, 'eng' for English, 'fre' or 'fra' for French, 'deu' or 'ger' for German.
 - The language code strings are not case sensitive, i.e. you can configure 'eng', 'ENG', 'ENg'.
 - There is no restriction on the number of language codes you can configure in the filters.
 - Filtering process
 - The list of configured language codes is compared to the languages codes set at the source grooming stage.
 - Language codes not being defined in the filter are filtered out.
 - Language codes defined in the filter do not need to completely match one of the sources (e.g. no alarm if you set 'spa' and there is no Spanish audio track ini the source).
 - If there is no match between the configured language codes and the ones set at the source grooming stage, the package output will include all audio tracks and there will have no alarms raised.

⚠ Note

All the sub-filters are whitelist selection: a stream must match all the sub-filters in order to be selected. An "exclude" flag is also available only for bitrateRange.

Configuration of the filtering:

1. Navigate to the **OTT Filters** tile in the **Lab Wizard** app.
2. Modify and/or clone an existing Input Stream Selection profile through the app UI or create/modify one through the REST API.

Lab Wizard app UI example:

The screenshot shows the 'INPUT STREAM SELECTION' page of the Lab Wizard application. At the top, there are tabs for 'PROFILE NAME' (set to 'Input Stream Selection Sample 1.0'), 'HARMONIC VERSION' (set to 'v.1 - Jan 01, 1970'), and 'CUSTOMER VERSION'. Below these are two code editors side-by-side. The left editor displays the following JSON configuration:

```

1+ {
2+   "audioStreamSelections": [
3+     {
4+       "audioCodecSelection": null,
5+       "bitrateRange": null
6+     }
7+   ],
8+   "videoStreamSelections": [
9+     {
10+      "videoCodecSelection": null,
11+      "frameRateRange": {
12+        "minFrameRate": 25,
13+        "maxFrameRate": 60
14+      },
15+      "horizontalResolutionRange": null,
16+      "verticalResolutionRange": null,
17+      "bitrateRange": null
18+    },
19+    {
20+      "videoCodecSelection": null,
21+      "frameRateRange": null,
22+      "horizontalResolutionRange": null,
23+      "verticalResolutionRange": {
24+        "minVerticalResolution": 480,
25+        "maxVerticalResolution": 480
26+      },
27+      "bitrateRange": {
28+        "minBitrate": 1000000
29+      }
30+    }
31+  ]
}

```

The right editor shows a similar JSON structure with some differences in the frame rate and vertical resolution ranges. At the bottom of the interface are buttons for 'Revert', 'Save as version' (with a checked checkbox), 'Save with a message...', and 'Save as New Profile'.

REST API example:

Sample Input Stream Selection Profile for POST /vos-api/labwizard/v1/profiles

Sample Input Stream Selection Profile

```
{
  "version": "",
  "creationTime": null,
  "lastUpdatedTime": null,
  "id": "6062b10b-327b-427c-b12f-0355672b8a93",
  "name": "Sample Input Stream Selection",
  "type": "e_INPUT_STREAM_SELECTION",
  "minRequiredVosBundleVersion": "",
  "harmonicVersion": "1.0",
  "customerVersion": null,
  "validateTime": null,
  "validated": true,
  "masterId": "6062b10b-327b-427c-b12f-0355672b8a93",
  "isTemplate": false,
  "isReadOnly": null,
  "isCustomized": true,
  "stbProfileProperties": null,
  "ottStbProfileProperties": null,
  "iptvProfileProperties": null,
  "multiscreenProfileProperties": null,
}
```

```
"mptsProfileProperties": null,
"broadcastCBRProfileProperties": null,
"destinationProfileProperties": null,
"iptvDestinationProfileProperties": null,
"atsDestinationProfileProperties": null,
"mptsDestinationProfileProperties": null,
"fileTranscodingProfileProperties": null,
"manipulationProfileProperties": null,
"inputStreamSelectionProfileProperties": {
    "audioStreamSelections": [
        {
            "audioCodecSelection": null,
            "bitrateRange": null
        }
    ],
    "videoStreamSelections": [
        {
            "videoCodecSelection": null,
            "frameRateRange": {
                "minFrameRate": 25,
                "maxFrameRate": 60
            },
            "horizontalResolutionRange": null,
            "verticalResolutionRange": null,
            "bitrateRange": null
        },
        {
            "videoCodecSelection": null,
            "frameRateRange": null,
            "horizontalResolutionRange": null,
            "verticalResolutionRange": {
                "minVerticalResolution": 480,
                "maxVerticalResolution": 480
            },
            "bitrateRange": {
                "exclude": false,
                "esBitrateRange": {
                    "minBitrateInbps": 0,
                    "maxBitrateInbps": 1800000
                }
            }
        },
        {
            "videoCodecSelection": null,
            "frameRateRange": null,
            "horizontalResolutionRange": null,
            "verticalResolutionRange": {
                "minVerticalResolution": 720,
                "maxVerticalResolution": 720
            },
            "bitrateRange": {
                "exclude": true,
                "esBitrateRange": {

```

```

        "minBitrateInbps": 0,
        "maxBitrateInbps": 2500000
    }
}
},
{
    "videoCodecSelection": null,
    "frameRateRange": null,
    "horizontalResolutionRange": {
        "minHorizontalResolution": 1920,
        "maxHorizontalResolution": 1920
    },
    "verticalResolutionRange": {
        "minVerticalResolution": 1080,
        "maxVerticalResolution": 1080
    },
    "bitrateRange": {
        "exclude": false,
        "esBitrateRange": {
            "minBitrateInbps": 0,
            "maxBitrateInbps": 900000
        }
    }
}
],
},
"drmTrackFilterProfileProperties": null,
"pureOttPlayoutProfileProperties": null,
"processingRequirementProperties": null,
"hlsGroupingProfileProperties": null,
"mmsTranscodeRequirements": null
}

```

Audio filter example

```
{
    "version": "",
    "creationTime": null,
    "lastUpdatedTime": null,
    "id": "766b8bb8-3225-424b-947c-3bcada9d0014",
    "labels": null,
    "name": "Filter_audio",
    "type": "e_INPUT_STREAM_SELECTION",
    "minRequiredVosBundleVersion": "",
    "harmonicVersion": "1.0",
    "customerVersion": "1",
    "validateTime": null,
    "validated": true,
    "masterId": "3a835d3e-ee41-47b4-b740-bd885c91c9ef",
}
```

```
"isTemplate": false,
"isReadOnly": null,
"isCustomized": false,
"stbProfileProperties": null,
"ottStbProfileProperties": null,
"iptvProfileProperties": null,
"multiscreenProfileProperties": null,
"mptsProfileProperties": null,
"demuxProfileProperties": null,
"broadcastCBRProfileProperties": null,
"destinationProfileProperties": null,
"iptvDestinationProfileProperties": null,
"atsDestinationProfileProperties": null,
"mptsDestinationProfileProperties": null,
"fileTranscodingProfileProperties": null,
"manipulationProfileProperties": null,
"drmTrackFilterProfileProperties": null,
"inputStreamSelectionProfileProperties": {
    "audioStreamSelections": [
        {
            "audioCodecSelection": HE_AAC_V1,
            "bitrateRange": null,
            "audioLanguageSelections": ["ENG", "SPA"]
        }
    ],
    "videoStreamSelections": []
},
"pureOttPlayoutProfileProperties": null,
"pureOttPlayoutDestinationProfileProperties": null,
"information": null,
"processingRequirementProperties": null,
"hlsGroupingProfileProperties": null,
"mmsTranscodeRequirements": null,
"attributeCustomizationProfileProperties": null
}
```

3. Apply the filter to the destination profile.

- Get the destination profile via REST API.

The screenshot shows the LabWizard interface with the following details:

- Endpoints:**
 - DELETE /labwizard/v1/cache** Delete Cache
 - GET /labwizard/v1/profiles** Get Profiles
 - POST /labwizard/v1/profiles** Create Profile
 - GET /labwizard/v1/profiles/{id}** Get profile
- Parameters:**

Name	Description
id * required string (path)	id 07af7cb2-ff49-2a32-077d-ef6491b40003
- Buttons:** Execute, Clear
- Responses:** Response content type: application/json

- Copy the JSON and use it to POST a new profile. Change the Id and profile name, and set the **inputStreamSelectionProfileId** parameter value to the Id of the filter created above.

Destination profile with filter

```
{
  "version": "",
  "creationTime": "2022-08-22T09:45:23.546Z",
  "lastUpdatedTime": "2022-08-22T09:45:23.546Z",
  "id": "07af7cb2-ff49-2a32-077d-ef6491b40003",
  "labels": [
    "Harmonic",
    "Destinations"
  ],
  "name": "TestFilter Destination",
  "type": "e_DESTINATION",
  "minRequiredVosBundleVersion": "",
  "harmonicVersion": "1.0",
  "customerVersion": "3",
  "validateTime": "2022-08-22T09:45:28.806Z",
  "validated": true,
  "masterId": "c8a93d36-e306-f457-877e-c7baafab0",
  "isTemplate": false,
  "isReadonly": false,
  "isCustomized": true,
  "stbProfileProperties": null,
  "ottStbProfileProperties": null,
  "iptvProfileProperties": null,
  "multiscreenProfileProperties": null,
  "mptsProfileProperties": null,
  "filterId": "07af7cb2-ff49-2a32-077d-ef6491b40003"
}
```

```
"demuxProfileProperties": null,
"broadcastCBRProfileProperties": null,
"destinationProfileProperties": {
    "enablePushPackaging": false,
    "muteOutputOnSignalLoss": null,
    "packagingProfilePropertiesList": [
        {
            "name": null,
            "packagingProfileType": "e_INTERNAL",
            "dashPackagingProperties": null,
            "hlsPackagingProperties": null,
            "ssPackagingProperties": null,
            "cmafPackagingProperties": null,
            "internalPackagingProperties": {
                "liveSegmentRetentionPeriod": 0,
                "fromliveSegmentRetentionPeriod": 360,
                "fromliveSegmentDuration": 0,
                "rtvodFlag": "e_NONE"
            },
            "rawTsPackagingProperties": null,
            "rtmpPackagingProperties": null,
            "thumbnailPackagingProperties": null,
            "manipulationProfileIds": null,
            "ottSetTopBoxProfileId": null,
            "inputStreamSelectionProfileId": null
        },
        {
            "name": "DASH1",
            "packagingProfileType": "e_DASH",
            "dashPackagingProperties": {
                "videoSegmentLength": 4,
                "audioSegmentLength": 4,
                "dvrWindowSize": 60,
                "minimumUpdatePeriod": -1,
                "minBufferTimeInMs": -1,
                "segmentRetentionPeriod": 2,
                "mediaPresentationProfile": "e_ISO_LIVE",
                "mpdFileName": "master",
                "representationIdPattern": "%starttimeitem-%streamIditem",
                "enablePackageBasedKeyRotation": false,
                "enableKeyRotation": true,
                "keyChangePeriod": 10800,
                "scte35Signaling": "e_NONE",
                "segmentTemplateType": "e_TIME_BASED",
                "enableOutputWebvtt": false,
                "enableOutputTtml": false,
                "encryptionMethod": "e_CENC",
                "enableChunkedCMAF": false,
                "videoSegmentLengthInMillisecond": 4000,
                "audioSegmentLengthInMillisecond": 4000,
                "utcTimingSchemeIdUri": "e_NONE",
                "utcTimingValue": "",
                "segmentLengthInMillisecond": 4000,
            }
        }
    ]
}
```

```
"ttmlTemplate": null,
"chunkDurationInMillisecond": 1000,
"availabilityTimeOffset": -1,
"suggestedPresentationDelayMillisecond": -1,
"teletextHandling": [
    "e_TO_WEBVTT"
],
"dvbSubtitleHandling": [
    "e_TO_SMPTE_TT"
],
"dvbTtmlHandling": [
    "e_TO_SMPTE_TT"
],
"closedCaptionHandling": [
    "e_TO_WEBVTT"
],
"scte27SubtitleHandling": [
    "e_TO_SMPTE_TT"
],
"useAbsoluteTimestamps": false,
"passThroughParameterSets": false,
"insertDefaultKIDToManifest": false,
"parentalControlSignaling": "e_EMSG",
"enableOttWatermark": false,
"altWatermarkOutputPrefix": "b.",
"enableEarlyAvailablePeriod": false,
"scte35CIDPassthrough": false,
"scte35DefaultAutoReturnDuration": 30,
"hideLatestSegment": false,
"serviceDescription": false,
"scopeSchemeIdUri": null,
"scopeValue": "",
"latencyTarget": 0,
"latencyMax": 0,
"latencyMin": 0,
"playbackRateMax": 0,
"playbackRateMin": 0,
"insertPrftToManifest": false,
"insertParAndSarAttributesInMpd": true,
"insertLabelElement": true,
"insertAudioChannelConfiguration": false,
"enableCommonSegmentUrlDelivery": false,
"enableFillGapNearPeriodStart": false,
"usePtsAsPto": false,
"enableThumbnailGeneration": false,
"thumbnailHeight": 720,
"imageSpriteInRow": 1,
"imageSpriteInColumn": 1,
"insertPrftToTimeshiftManifest": false,
"availabilityStartTimeOffsetInMs": 0
},
"hlsPackagingProperties": null,
"ssPackagingProperties": null,
```

```
"cmafPackagingProperties": null,
"internalPackagingProperties": null,
"rawTsPackagingProperties": null,
"rtmpPackagingProperties": null,
"thumbnailPackagingProperties": null,
"manipulationProfileIds": null,
"ottSetTopBoxProfileId": null,
"inputStreamSelectionProfileId": null
},
{
  "name": "DASH2",
  "packagingProfileType": "e_DASH",
  "dashPackagingProperties": {
    "videoSegmentLength": 4,
    "audioSegmentLength": 4,
    "dvrWindowSize": 60,
    "minimumUpdatePeriod": -1,
    "minBufferTimeInMs": -1,
    "segmentRetentionPeriod": 2,
    "mediaPresentationProfile": "e_ISO_LIVE",
    "mpdFileName": "master",
    "representationIdPattern": "%starttimeitem-%streamIditem",
    "enablePackageBasedKeyRotation": false,
    "enableKeyRotation": true,
    "keyChangePeriod": 10800,
    "scte35Signaling": "e_NONE",
    "segmentTemplateType": "e_TIME_BASED",
    "enableOutputWebvtt": false,
    "enableOutputTtml": false,
    "encryptionMethod": "e_CENC",
    "enableChunkedCMAF": false,
    "videoSegmentLengthInMillisecond": 4000,
    "audioSegmentLengthInMillisecond": 4000,
    "utcTimingSchemeIdUri": "e_NONE",
    "utcTimingValue": "",
    "segmentLengthInMillisecond": 4000,
    "ttmlTemplate": null,
    "chunkDurationInMillisecond": 1000,
    "availabilityTimeOffset": -1,
    "suggestedPresentationDelayMillisecond": -1,
    "teletextHandling": [
      "e_TO_WEBVTT"
    ],
    "dvbSubtitleHandling": [
      "e_TO_SMPTE_TT"
    ],
    "dvbTtmlHandling": [
      "e_TO_SMPTE_TT"
    ],
    "closedCaptionHandling": [
      "e_TO_WEBVTT"
    ],
    "scte27SubtitleHandling": [

```

```
        "e_TO_SMPTE_TT"
    ],
    "useAbsoluteTimestamps": false,
    "passThroughParameterSets": false,
    "insertDefaultKIDToManifest": false,
    "parentalControlSignaling": "e_EMSG",
    "enableOttWatermark": false,
    "altWatermarkOutputPrefix": "b.",
    "enableEarlyAvailablePeriod": false,
    "scte35CIDPassthrough": false,
    "scte35DefaultAutoReturnDuration": 30,
    "hideLatestSegment": false,
    "serviceDescription": false,
    "scopeSchemeIdUri": null,
    "scopeValue": "",
    "latencyTarget": 0,
    "latencyMax": 0,
    "latencyMin": 0,
    "playbackRateMax": 0,
    "playbackRateMin": 0,
    "insertPrftToManifest": false,
    "insertParAndSarAttributesInMpd": true,
    "insertLabelElement": true,
    "insertAudioChannelConfiguration": false,
    "enableCommonSegmentUrlDelivery": false,
    "enableFillGapNearPeriodStart": false,
    "usePtsAsPto": false,
    "enableThumbnailGeneration": false,
    "thumbnailHeight": 720,
    "imageSpriteInRow": 1,
    "imageSpriteInColumn": 1,
    "insertPrftToTimeshiftManifest": false,
    "availabilityStartTimeOffsetInMs": 0
},
"hlsPackagingProperties": null,
"ssPackagingProperties": null,
"cmafPackagingProperties": null,
"internalPackagingProperties": null,
"rawTsPackagingProperties": null,
"rtmpPackagingProperties": null,
"thumbnailPackagingProperties": null,
"manipulationProfileIds": null,
"ottSetTopBoxProfileId": null,
"inputStreamSelectionProfileId":
"766b8bb8-3225-424b-947c-3bcada9d0003"
},
{
    "name": "HLS1",
    "packagingProfileType": "e_HLS",
    "dashPackagingProperties": null,
    "hlsPackagingProperties": {
        "segmentLength": 4,
        "segmentLengthInMillisecond": 4000,
```

```
"dvrWindowSize": 60,
"segmentRetentionPeriod": 2,
"variantPlaylistFileName": "master",
"generateAudioOnlyStream": false,
"lateBindingAudio": "e_DISABLE_LATE_BINDING_AUDIO",
"useCmaf": false,
"enableSubFolderMode": false,
"indexFileNameForMediaStreamForFlattenedMode": "%streamid",
"indexFileNameForIFrameOnlyStreamForFlattenedMode": "%streamid-
iframe",
"segmentFileNamePrefixForFlattenedMode": "%starttime-%sequence-
%streamid-%time",
"subtitleNamePattern": "",
"urlOrderOfVariantPlaylist": "e_BITRATE_ASCENDING",
"enableCodecsAttributeInVariantPlaylist": false,
"richSegmentUriInfo": false,
"floatingPointDurationInPlaylist": false,
"generateIFrameOnlyPlaylist": false,
"packagingEncryptionProfileId": "UNDEFINED",
"hlsEncryptionMethod": "e_HLS_SAMPLE_AES",
"enablePackageBasedKeyRotation": false,
"enableKeyRotation": true,
"keyChangePeriod": 10800,
"scte35Signaling": "e_NONE",
"scte35AnnotationTag": "e_SCTE35",
"enableLowLatencyMode": false,
"specifyStartingLivePoint": false,
"startingLivePoint": 0,
"targetDuration": 0,
"enableAverageBandwidthAttribute": false,
"teletextHandling": "e_TO_WEBVTT",
"teletextHandlingList": [
    "e_TO_WEBVTT"
],
"closedCaptionHandling": [
    "e_TO_WEBVTT",
    "e_PASSTHROUGH"
],
"ttmlTemplate": null,
"dvbSubtitleHandling": [
    "e_TO SMPTE_TT"
],
"scte27SubtitleHandling": [
    "e_TO SMPTE_TT"
],
"enableChunkedCMAF": false,
"chunkDurationInMillisecond": 1000,
"enablePartialSegment": false,
"enablePlaylistTypeEventTag": false,
"enableAbsoluteURL": false,
"absoluteVariantPlaylistFileName": "index-abs",
"enableCcDeclaration": true,
"passThroughParameterSets": false,
```

```
"firstSegmentProgramDateTime": false,
"enableOttWatermark": false,
"altWatermarkOutputPrefix": "b.",
"scte35DefaultAutoReturnDuration": 30,
"customGroupingProfileId": null,
"displayHdcpLevelAttribute": false,
"enableWebVttSourcePositioning": true,
"enableWebVttStyling": true,
"dvbTtmlHandling": [
    "e_TO_WEBVTT"
],
"isoLanguageCode": "e_ISO_639_2_3",
"nameAttribute": "DEFAULT",
"skipDuplicateExtXKeyTag": false,
"enableCommonSegmentUrlDelivery": false,
"commonEncryptionScheme": "CENC_CENC",
"dropSgpdBox": false,
"scte35CIDPassthrough": false,
"attributeCustomizationProfileId": null,
"encryptSEI": true,
"scte35GoogleHlsVodAnnotationType": "e_PLACEMENT OPPORTUNITY",
"noExtXKeyTagForUnencryptedStreams": false,
"partTargetDurationInMs": 0,
"displayHResolutionRounding": "e_TO_CLOSEST EVEN"
},
"ssPackagingProperties": null,
"cmafPackagingProperties": null,
"internalPackagingProperties": null,
"rawTsPackagingProperties": null,
"rtmpPackagingProperties": null,
"thumbnailPackagingProperties": null,
"manipulationProfileIds": null,
"ottSetTopBoxProfileId": null,
"inputStreamSelectionProfileId":
"766b8bb8-3225-424b-947c-3bcada9d0003"
},
{
"name": "HLS2",
"packagingProfileType": "e_HLS",
"dashPackagingProperties": null,
"hlsPackagingProperties": {
"segmentLength": 4,
"segmentLengthInMillisecond": 4000,
"dvrWindowSize": 60,
"segmentRetentionPeriod": 2,
"variantPlaylistFileName": "master",
"generateAudioOnlyStream": false,
"lateBindingAudio": "e_ENABLE_LATE_BINDING_AUDIO",
"useCmaf": true,
"enableSubFolderMode": false,
"indexFileNameForMediaStreamForFlattenedMode": "%streamid",
"indexFileNameForIFrameOnlyStreamForFlattenedMode": "%streamid-
iframe",
```

```
"segmentFileNamePrefixForFlattenedMode": "%starttime-%sequence-%streamid-%time",
"subtitleNamePattern": "",
"urlOrderOfVariantPlaylist": "e_BITRATE_ASCENDING",
"enableCodecsAttributeInVariantPlaylist": false,
"richSegmentUriInfo": false,
"floatingPointDurationInPlaylist": false,
"generateIFrameOnlyPlaylist": false,
"packagingEncryptionProfileId": "UNDEFINED",
"hlsEncryptionMethod": "e_HLS_SAMPLE_AES",
"enablePackageBasedKeyRotation": false,
"enableKeyRotation": true,
"keyChangePeriod": 10800,
"scte35Signaling": "e_NONE",
"scte35AnnotationTag": "e_SCTE35",
"enableLowLatencyMode": false,
"specifyStartingLivePoint": false,
"startingLivePoint": 0,
"targetDuration": 0,
"enableAverageBandwidthAttribute": false,
"teletextHandling": "e_TO_WEBVTT",
"teletextHandlingList": [
    "e_TO_WEBVTT"
],
"closedCaptionHandling": [
    "e_TO_WEBVTT",
    "e_PASSTHROUGH"
],
"ttmlTemplate": null,
"dvbsubtitleHandling": [
    "e_TO SMPTE_TT"
],
"scte27SubtitleHandling": [
    "e_TO SMPTE_TT"
],
"enableChunkedCMAF": false,
"chunkDurationInMillisecond": 1000,
"enablePartialSegment": false,
"enablePlaylistTypeEventTag": false,
"enableAbsoluteURL": false,
"absoluteVariantPlaylistFileName": "index-abs",
"enableCcDeclaration": true,
"passThroughParameterSets": false,
"firstSegmentProgramDateTime": false,
"enableOttWatermark": false,
"altWatermarkOutputPrefix": "b.",
"scte35DefaultAutoReturnDuration": 30,
"customGroupingProfileId": null,
"displayHdcpLevelAttribute": false,
"enableWebVttSourcePositioning": true,
"enableWebVttStyling": true,
"dvbttmlHandling": [
    "e_TO_WEBVTT"
]
```

```
        ],
        "isoLanguageCode": "e_ISO_639_2_3",
        "nameAttribute": "DEFAULT",
        "skipDuplicateExtXKeyTag": false,
        "enableCommonSegmentUrlDelivery": false,
        "commonEncryptionScheme": "CENC_CENC",
        "dropSgpdBx": false,
        "scte35CIDPassthrough": false,
        "attributeCustomizationProfileId": null,
        "encryptSEI": true,
        "scte35GoogleHlsVodAnnotationType": "e_PLACEMENT OPPORTUNITY",
        "noExtXKeyTagForUnencryptedStreams": false,
        "partTargetDurationInMs": 0,
        "displayHResolutionRounding": "e_TO CLOSEST EVEN"
    },
    "ssPackagingProperties": null,
    "cmafPackagingProperties": null,
    "internalPackagingProperties": null,
    "rawTsPackagingProperties": null,
    "rtmpPackagingProperties": null,
    "thumbnailPackagingProperties": null,
    "manipulationProfileIds": null,
    "ottSetTopBoxProfileId": null,
    "inputStreamSelectionProfileId":
    "766b8bb8-3225-424b-947c-3bcada9d0003"
}
],
"enableOttWatermark": false,
"packagerClock": "e_SYSTEM_WALL_CLOCK",
"maxSourceTimeCodeOffset": 0
},
"iptvDestinationProfileProperties": null,
"atsDestinationProfileProperties": null,
"mptsDestinationProfileProperties": null,
"fileTranscodingProfileProperties": null,
"manipulationProfileProperties": null,
"drmTrackFilterProfileProperties": null,
"inputStreamSelectionProfileProperties": null,
"pureOttPlayoutProfileProperties": null,
"pureOttPlayoutDestinationProfileProperties": null,
"information": {
    "description": [
        {
            "key": "Set master profile",
            "oriValue": "",
            "newValue": "HLS Destination"
        }
    ],
    "supercede": "",
    "createUser": "vos",
    "createUserEmail": "vos@harmonicinc.com",
    "validateUser": "vos",
    "validateUserEmail": "vos@harmonicinc.com",
    "validateUserEmail": "vos@harmonicinc.com",
```

```
        "note": "Created based on profile: HLS Destination"
    },
    "processingRequirementProperties": null,
    "hlsGroupingProfileProperties": null,
    "mmsTranscodeRequirements": null,
    "attributeCustomizationProfileProperties": null
}
```

Configuring Dolby stereo source to Dolby 5.1 output via REST API

The Dolby AC-3 stereo source can be upsignaled as a 5.1 signal to downstream devices using VOS REST API.

Note

Upsilonignal means, from 2.0 to 5.1 for instance, the input 2 channels will be outputted as front left and front right in the output while the other 4 audio channels remain silent.

The minimum required audio bitrate is 224 kbps for AC-3 5.1 channel audio output.

1. Navigate to the **DevOps Portal** app > **Developer API**.
2. Under **LabWizard**, navigate to **GET/labwizard/v1/profiles**, click **Try it out!**.
3. Navigate to the IPTV Profile and Multiscreen Profile that you wish to configure Dolby stereo source to 5.1 output.
4. Examine the "Upsilonignal" parameter in the **IPTVProfileProperties** and **MultiscreenProfileProperties**.

IPTV Profile

IPTVProfileProperties {

audioMatchingMode (*string, optional*): The audio matching mode indicates how the audio encoding profile is specified. User can specify audio encoding profile per each language type, or specify the audio encoding profile based on the label associated with the input audio = ['e_MATCH_BY_LANGUAGE', 'e_MATCH_BY_LABEL'],
audios (*Array[Audio], optional*): List of IPTV audio processing setting,
bandwidth (*integer*): Maximum bitrate of output stream in Mbps,
breakoutCode (*string, optional*): The breakout code indicates the preferred Nielsen crediting model, which is based on the type of content and Ad-load model = ['e_NONE', 'e_LIVE_CONTENT_WITH_SAME_TV_ADS', 'e_LIVE_CONTENT_WITHOUT_SAME_TV_ADS'],
data (*Array[Data], optional*): List of IPTV data processing setting,
dataFilteringMode (*string, optional*): Data filtering mode = ['e_INCLUDE_ALL_DATA', 'e_FILTER_BY_SRC_LABEL'],
dvbProviderName (*string, optional*): Provider name of the DVB SDT. Applicable when sdtGenerationMode is e_GENERATE,
editingStatus (*integer, optional*): The editing status indicate which properties group is in manual mode, user cannot configure properties on the left parametric section in the profile editor,
outputPcrPid (*integer, optional*): Output PID of the PCR,
outputPipPcrPid (*integer, optional*): PIP output PID of the PCR,
outputPipPmtPid (*integer, optional*): PIP output PID of the PMT. Default value is equal to -1,
outputPmtPid (*integer, optional*): output PID of the PMT. Default value is equal to 480,
receiverTimezone (*string, optional*): IATA timezone for receiver,
scheduling (*Scheduling, optional*): Scheduling setting,
sdtGenerationMode (*string, optional*): SDT generation mode: e_FOLLOW_INPUT to transmit the ingress SDT, e_GENERATE to set the DVB service name to the VOS service name, set the NetworkId to 0 and transmit that SDT or e_DISABLE to disable the SDT output = ['e_FOLLOW_INPUT', 'e_GENERATE', 'e_DISABLE'],
setTopBoxProfileId (*string*): Specify the id of the set top box profile,
streamBasedAudios (*Array[StreamBasedAudio], optional*): List of IPTV Stream based audio processing setting,
upsignal (*boolean, optional*): Enable AC3 upsignaling (supports AC3 5.1 audio output only),
video (*Video, optional*): IPTV video processing setting

}**Multiscreen Profile****MultiscreenProfileProperties {**

audioMatchingMode (*string, optional*): The audio matching mode indicates how the audio encoding profile is specified. User can specify audio encoding profile per each language type, or specify the audio encoding profile based on the label associated with the input audio = ['e_MATCH_BY_LANGUAGE', 'e_MATCH_BY_LABEL'],
audios (*Array[MultiscreenAudio], optional*): List of multiscreen audio processing setting,
breakoutCode (*string, optional*): The breakout code indicates the preferred Nielsen crediting model, which is based on the type of content and Ad-load model = ['e_NONE', 'e_LIVE_CONTENT_WITH_SAME_TV_ADS', 'e_LIVE_CONTENT_WITHOUT_SAME_TV_ADS'],
data (*Array[MultiscreenData], optional*): List of multiscreen data processing setting,
dataFilteringMode (*string, optional*): Data filtering mode = ['e_INCLUDE_ALL_DATA', 'e_FILTER_BY_SRC_LABEL'],
dvbProviderName (*string, optional*): Provider name of the DVB SDT. Applicable when sdtGenerationMode is e_GENERATE,
editingStatus (*integer, optional*): The editing status indicate which properties group is in manual mode, user cannot configure properties on the left parametric section in the profile editor,
endpoint (*string, optional*): Specify end point support Adaptive Transport Stream or Multi-bitrate = ['e_ATS', 'e_HARMONIC_MBTS'],
outputPcrPid (*integer, optional*): Output PID of the PCR,
outputPmtPid (*integer, optional*): output PID of the PMT. Default value is equal to 480,
preferredAudioProfile (*integer, optional*): Select audio profile profile as preferred bit rate for multiscreen profile, range from 1-16, default will be 1,
preferredVideoProfile (*integer, optional*): Select video profile profile as preferred bit rate for multiscreen profile, range from 1-11, default will be one level above the lowest video bit rate,
receiverTimezone (*string, optional*): IATA timezone for receiver,
scheduling (*Scheduling, optional*): Scheduling setting,
sdtGenerationMode (*string, optional*): SDT generation mode: e_FOLLOW_INPUT to transmit the ingress SDT and patch the program name with the VOS service name, the resolution, the frame-rate and the bitrate, e_GENERATE to set the DVB service name to service name+resolution+framerate+bitrate, set the NetworkId to 0 and transmit that SDT or e_DISABLE to disable the SDT output = ['e_FOLLOW_INPUT', 'e_GENERATE', 'e_DISABLE'],
setTopBoxProfileId (*string*): Specify the Id of STB profile,
streamBasedAudios (*Array[MultiscreenStreamBasedAudio], optional*): List of multiscreen pid based audio processing setting,
upsignal (*boolean, optional*): Enable AC3 upsignaling (supports AC3 5.1 audio output only),
video (*MultiscreenVideo, optional*): Multicreen video processing setting

}**5. Configure "upsignal" to True.**** Note**

This optional parameter is configured as "**False**" by default (i.e. the feature is not enabled) and the system will behave as stated in the previous behaviour by default.

Configuring and monitoring services

A service, or channel, consists of a transcoding profile, a source input, a destination (or delivery location), and, optionally, service add-ons such as graphic overlays and SCTE ad insertion.

Create and manage sources, destinations, and services with the Configure Channels app.

Note

You may use a source in more than one service; however, each destination can be used in a single service.

- [Configure Channels app overview](#)
- [Configuring a source input](#)
- [Configuring a destination](#)
- [Configuring a service](#)
- [Uploading image files](#)
- [Configuring identical services for geo-redundancy](#)
- [Manually switching input sources](#)
- [Scrambling and encrypting services](#)
- [About Origin/CDN destinations](#)
- [Monitoring a transport stream](#)

Configure Channels app overview

Review the layout of each page and the function of each element on the page.

- [Sources page](#)
- [Destinations page](#)
- [Services page](#)
- [Filtering sources, destinations, and services](#)
- [Settings](#)

Sources page

View all of the sources that have been configured for this VOS Cloud-Native Software. Review the page layout and understand the function of each element on the page.

Sources page

Toggle display of your CloudLinks Filter sources by name Filter sources by state or by input Access Configure app settings

Create a new source

Number of services that use the source

Click a source panel to open the Edit Source pane

Source	Services
WS1src	1 Services
WS1TV	1 Services
WS2src	2 Services
WS3src	1 Services
WS4src	1 Services

Destinations page

View all of the service destinations that have been configured for this VOS Cloud-Native Software. Review the page layout and understand the function of each element on the page.

Destinations page

Icons indicate the destination type

Toggle display of your CloudLinks Filter destinations by name Filter destinations by type or by state Access the Configure app settings

Create a new destination

Number of services that use the destination

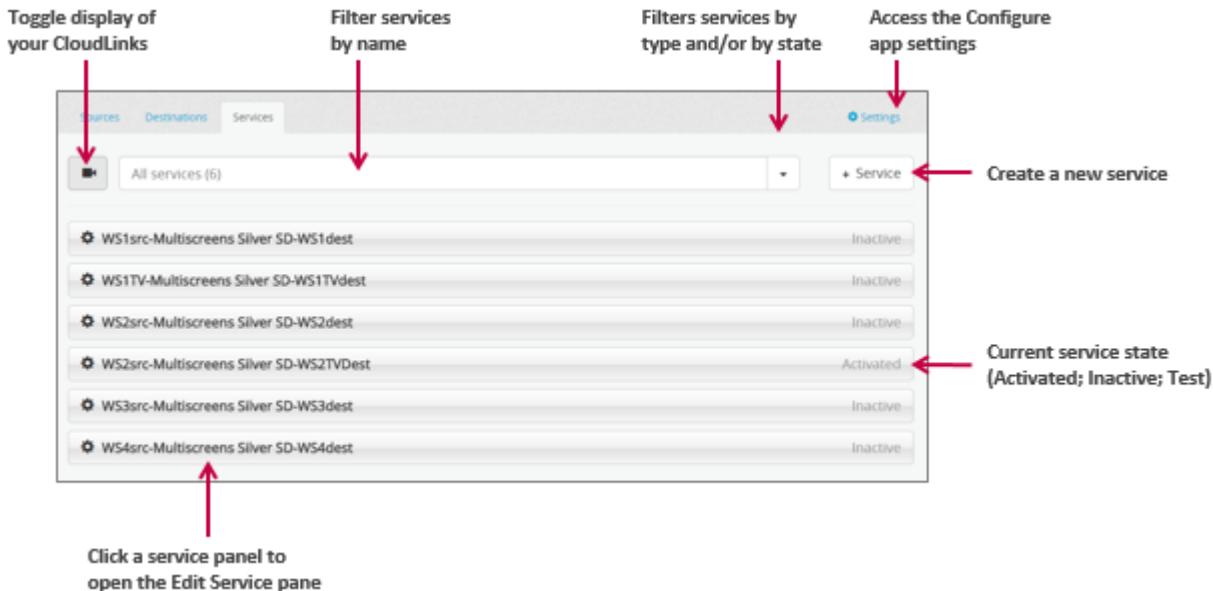
Click a destination panel to open the Edit Destination pane

Destination	Services
WS2ATSDest	0 Services
WS2IPDest	0 Services
WS2TVDest	1 Services
WS1dest	1 Services
WS1TVdest	1 Services
WS2dest	1 Services
WS3dest	1 Services
WS4dest	1 Services

Services page

View all of the services that have been configured for this VOS Cloud-Native Software. Review the page layout and understand the function of each element on the page.

Services page



Filtering sources, destinations, and services

From the Configure Channels app, filter using a variety of facets to help you quickly find the desired source, destination, or service.

The filter drop-down

The filter drop-down presents a list of facets based on the page you are viewing. You can filter sources by the following:

- State (**Used** or **Unused**)
- Input status (**Input defined** or **No input**)

You can filter destinations by the following:

- Type (**IP** or **Origin/CDN**)
- State (**Used** or **Unused**)

You can filter services by the following:

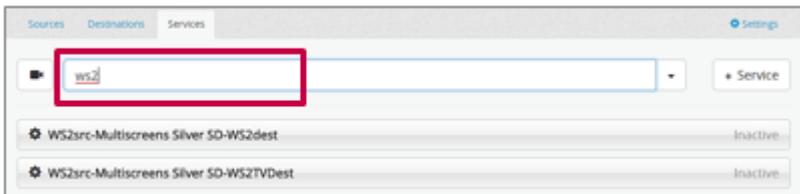
- Priority (**Low**, **Normal**, **High**)
- State (**Active** or **Inactive**)
- Type (**IPTV**)
- Scrambling (**Enabled**, **Disabled**)

Filter drop-down list



Name filter

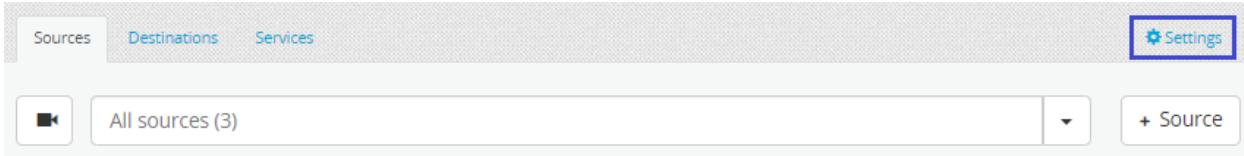
To filter by name, type a letter or string of letters in the **Search** field.



Settings

You can define Service preferences and Video Languages preferences. In addition, you can customize global settings for Video, Audio, Subtitle, Source and Nielsen watermarking.

- From the **Configure Channels** app, click **Settings** at the top right corner of the screen.



2. Navigate to the **General** tab to define Service preferences and Video Languages preferences.

The screenshot shows the 'Settings' screen with the 'General' tab selected. Under 'SERVICE PREFERENCES', there are two options: 'IPTV' and 'Multiscreen'. In the 'VIDEO LANGUAGES — in order of preference' section, the 'US-West' location is selected. A list of three languages is shown: English (1), Spanish (2), and French (3). Below this list is a button labeled '+ Language'. At the bottom of the screen, there is information about NIELSEN, including Vendor ID: 503, SDK Version: 2.3.0, and Distributor ID. A URL field contains 'www.yourcompany.com'.

⚠ This list appears when a language needs to be indicated in other pages (to select an audio component for instance).

3. Navigate the **Advanced** tab to customize global settings for Video, Audio, Subtitle, Source and Nielsen watermarking.

The screenshot shows the 'Settings' page with the 'Advanced' tab selected. The interface is divided into several sections:

- VIDEO** — Customize global setting for the video.
 - COPY RIGHT: Copyrighted Original
 - VIDEO STANDARD: 25_50 Hz
 - STRESS BIAS: Soft Cleaner
- AUDIO** — Customize global setting for the audio.
 - COPY RIGHT: Copyrighted Copy
- SUBTITLE** — Customize global setting for subtitle.
 - TELETEXT SUBTITLE PROCESSING MODE: World System Teletext
- SOURCE** — Customize global setting for the source fail over conditions.
 - TYPE:
 - VIDEO MISSING
 - SCRAMBLED VIDEO PID
 - AUDIO PID MISSING
- NIELSEN** — Customize Nielsen setting for the audio watermarking.
 - SENDER TIME ZONE: UTC (GMT+00:00)

⚠️ For Nielsen audio watermarking, the **Sender Time Zone** setting is used to calculate automatically the daylight saving time according to the time zone of the sender.

4. (Optional) Configure the global setting **GPS UTC Offset**. The default value is 18s. If the GPS UTC Offset is configured, the system time will be computed from the current UTC time and configured GPS UTC offset duration.
5. Click **Save**.

Configuring a source input

When you add a new source, VOS discovers the properties of the source and returns detailed information about it. The source can then be used to configure a service.

- ⓘ You can use a source in more than one service.

- [Supported input types](#)
- [Configuring source input](#)
- [Grooming the source input](#)

Supported input types

VOS Cloud-Native Software supports a variety of input types for various media processing and delivery workflows.

Type of input	Description	Applicable workflows
IP	<p>Compressed MPEG2-TS sources (SPTS, MPTS or MBTS)</p> <div style="border: 1px solid #fca; padding: 10px; margin-top: 10px;"> <p>⚠️ VOS passes through timecode (VITC) from IP compressed sources (AVC/HEVC video) into the output transcoded video (AVC/HEVC).</p> </div>	<p>SPTS, MPTS: Workflows including transcoding MBTS: Pure OTT packaging (no transcoding)</p>
HSP (Harmonic Streaming Protocol)	<p>Used to securely deliver high bitrate live content to VOS over internet.</p>	Transcoding
CloudLink	<p>Used to securely deliver high bitrate live content to and from VOS over internet.</p> <p>A software-based solution for uploading video to VOS. Note the following:</p> <ul style="list-style-type: none"> • You must specify the multicast IP address and UDP port range for each source propagated by the CloudLink. 	<p>SPTS, MPTS: Workflows including transcoding MBTS: Pure OTT packaging (no transcoding)</p>

Type of input	Description	Applicable workflows
Zixi	<p>A hardware-based solution for uploading video to VOS.</p> <p>Note the following:</p> <ul style="list-style-type: none"> • Requires an in-house, Zixi compatible encoder. • An upload IP address and port number are automatically assigned. • You must configure the Zixi encoder to output to the assigned IP address and port number. 	
SRT	Cloudlink hosting channels that use SRT protocol to deliver video data over public networks.	
RTMP	Used to generate the endpoint URL for push packaging.	
Baseband	Used to ingest baseband content (SMPTE 2022-6, 2110) into VOS.	Transcoding
Playout Source	Operators can use the VOS Playout Monitor app to monitor playout channels and perform master control operations.	
OTT Playout Source	This is not available for VOS Cloud-Native Software (For VOS360 only).	
Signal loss	<p>Used to configure a slate that will be inserted in case of signal loss.</p> <p>Can be used in addition to other input sources in transcoding workflows.</p>	Transcoding

Configuring source input

- [Configuring an IP source input](#)
- [Configuring a CloudLink source input](#)
- [Configuring a Cloud Source input](#)
- [Configuring an HSP source input](#)
- [Configuring a baseband source input](#)
 - [Configuring the SMPTE 2022-6 source input](#)
 - [Configuring the SMPTE 2110 source input](#)
 - [Configuring NMOS adapter for IS-04/IS-05 communication to NMOS controller](#)

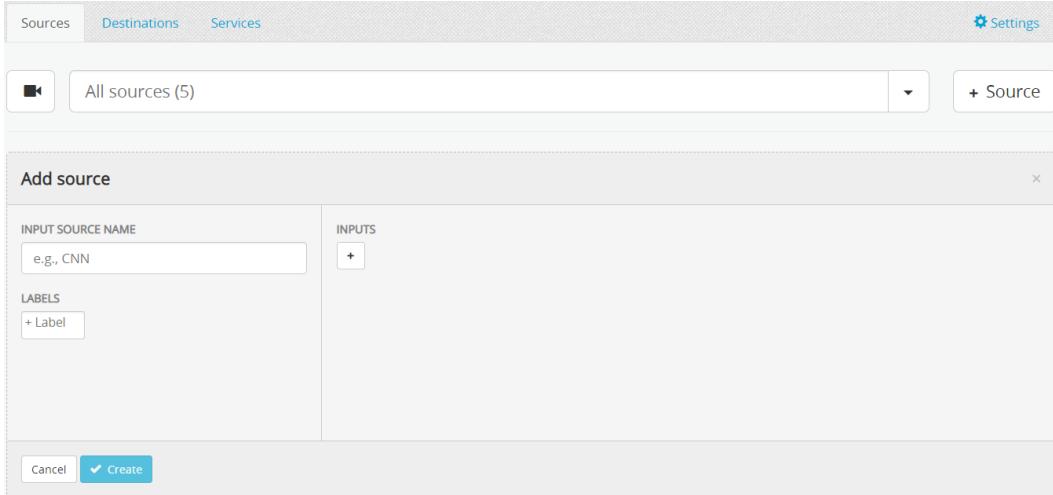
- Configuring a SRT source input
 - Configuring the source with SRT path redundancy
- Configuring an RTMP source input
- Configuring a Zixi source input

Configuring an IP source input

IP inputs are used to ingest MPEG2-TS sources into VOS (SPTS, MPTS, or MBTS). In addition, watermark inputs are supported for the OTT packaging services.

- ⚠** Ensure that the multicast IP and port do not conflict with other network services and that your network is correctly configured (IGMP querier).

1. From the **Configure Channels** app, navigate to the **Sources** page, click **+ Source**.



2. In the **Input Source Name** field, enter the name of the new source.
3. If you wish to be able to filter by user-defined labels, enter a label in the **Labels** field.
4. Below **Inputs**, configure the **Signal Loss** input by doing one of the following:
 - a. Select the desired **Signal lost image**.
 - b. Click the **Display a black screen** toggle to display a black screen during signal loss.
 - c. Click **Remove** to delete the input if it is not required.

Note that signal loss is only supported in workflows that include transcoding.
5. Click **+Input** icon and then select **IP**.
 - a. Enter the multicast source **IP Address** and
Result: The **Network** field appears, allowing you to select the subnet from which you expect to receive the multicast source.
 - b. Enter the multicast source **Port** number.
 - c. For MBTS sources: If you are using a range of contiguous ports, such as [10001:10006], enter the **PORT END** number.
For SPTS and MPTS source, this field must remain empty.

(i) The maximum supported range is 32 ports.

- d. Optionally, add a source-specific multicast IP address in the **SSM** field.
- e. For MBTS sources: Optionally, click the **Add** icon to be able to enter multiple multicast IP addresses or non-contiguous ports.

MBTS source with non-contiguous ports

IP ADDRESS	NETWORK	PORT
225.10.10.10	192.168.30.105	10001
225.10.10.10	192.168.30.105	10003
225.10.10.10	192.168.30.105	10005
+		

MBTS source with multiple multicast IP addresses

IP ADDRESS	NETWORK	PORT
225.10.10.10	192.168.30.105	10001
225.10.10.20	192.168.30.105	10001
225.10.10.30	192.168.30.105	10001
+		

- f. Click **Connect** to have VOS discover the source.
If VOS cannot discover the source, an error message will display.
- g. Once the source is discovered, click **Choose from X programs** and then select the program you want to use.
Only one program will be listed for SPTS sources.

Connect	Found: SPTS	Choose from 1 programs ▾
1:		
Remove		

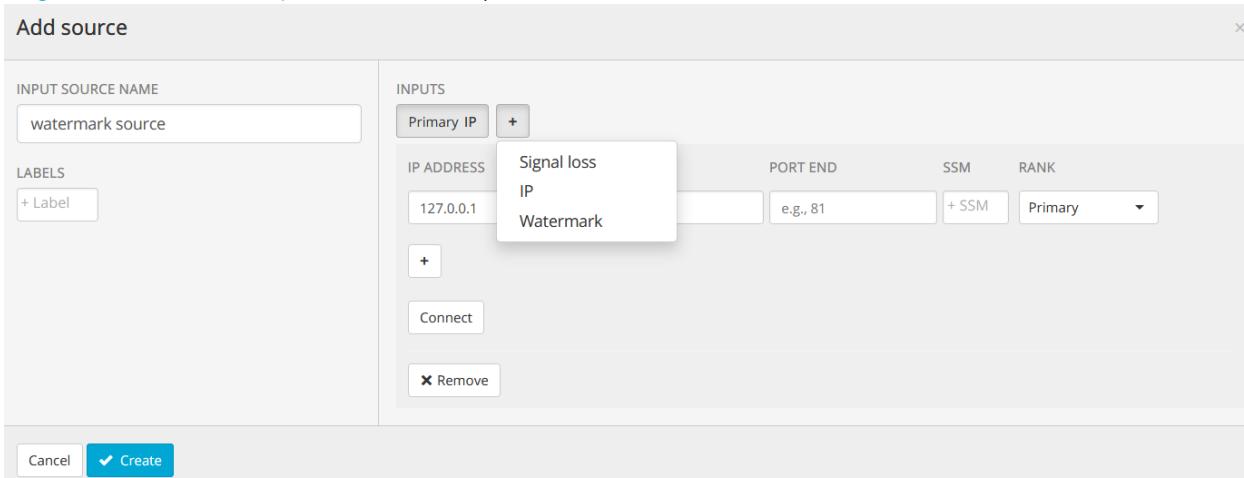
- h. Click **Groom** to check the properties of the source and customize how it will be processed downstream.

- 6. To add a backup MBTS input source, repeat the step 5.

⚠ For an SPTS/MPTS input of live transcoding service, source redundancy should be used instead.

⚠ If the PIDs of the second input are different than the PIDs of the first input, an error will occur.

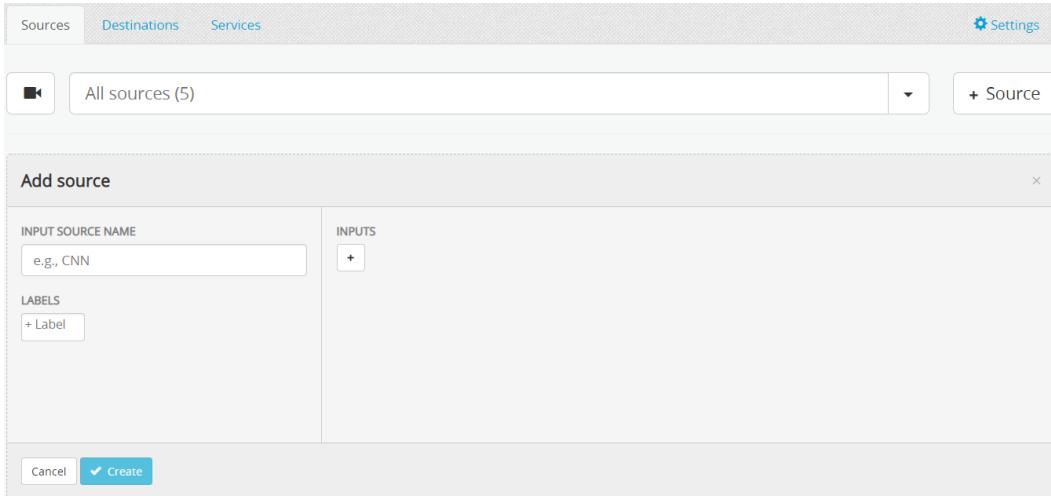
7. (Optional) To configure an OTT Watermarking packaging service, you can configure inputs in the "Primary IP" section and add the **Watermark** from the drop-down menu by clicking the "**+Input**" button. Configure the Watermark inputs (those inputs are from a Watermark transcoding service output). The Watermark inputs are also displayed in IP type input. (For the whole OTT Watermarking workflow, refer to [Creating an Origin/CDN destination profile](#) for details.)



8. From the **Add source** pane, click **Create** to add the source.

Configuring a CloudLink source input

- From the **Configure Channels** app, navigate to the **Sources** page, click **+ Source**.



- In the **Input Source Name** field, enter the name of the new source.
- If you wish to be able to filter by user-defined labels, enter a label in the **Labels** field.
- Below **Inputs**, configure the **Signal Loss** input by doing one of the following:
 - Select the desired **Signal lost image**.
 - Click the **Display a black screen** toggle to display a black screen during signal loss.
 - Click **Remove** to delete the input if it is not required.

Note that signal loss is only supported in workflows that include transcoding.
- Click the **Add Input** icon and then select **CloudLink**.
- Configure the following settings:

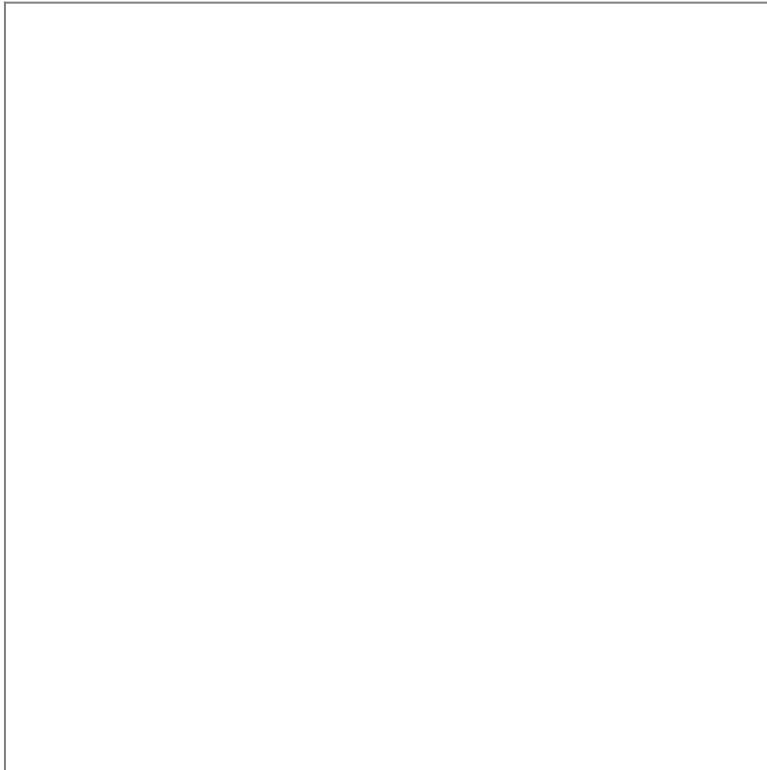
IP Address	IP address of the live source (filled by VOS).
Port	The start Port number in the port range used by the live source (filled by VOS).
Port End	The end Port number in the port range used by the live source (filled by VOS).
SSM	Source-specific multicast IP address

- Click **Connect**.

Result: VOS discovers the input source after a few seconds. If it cannot find the input source, the following message will appear: No data found. Please check your source.

- Choose a program from the list and, optionally, click **Play** to view the video source.

Result: If any issues with the transport stream are detected, then a **Grooming needed** alert appears.



- If grooming is needed, proceed with grooming the source input.
- From the **Add source** pane, click **Create** to add the source.

Configuring a Cloud Source input

- From the **Configure Channels** app, navigate to the **Sources** page, click **+ Source**.

The screenshot shows the 'Add source' dialog box. At the top, there are tabs for 'Sources' (which is selected), 'Destinations', and 'Services'. To the right is a 'Settings' gear icon. Below the tabs, there's a camera icon, a dropdown menu showing 'All sources (5)', and a '+ Source' button. The main area of the dialog is titled 'Add source'. It has three sections: 'INPUT SOURCE NAME' with a field containing 'e.g., CNN', 'LABELS' with a '+ Label' button, and 'INPUTS' with a '+' button. At the bottom of the dialog are 'Cancel' and '✓ Create' buttons.

- In the **Input Source Name** field, enter the name of the new source.
- If you wish to be able to filter by user-defined labels, enter a label in the **Labels** field.
- Below **Inputs**, configure the **Signal Loss** input by doing one of the following:

- a. Select the desired **Signal lost image**.
- b. Click the **Display a black screen** toggle to display a black screen during signal loss.
- c. Click **Remove** to delete the input if it is not required.

Note that signal loss is only supported in workflows that include transcoding.

5. Click the **Add Input** icon and then select **Cloud Source**.

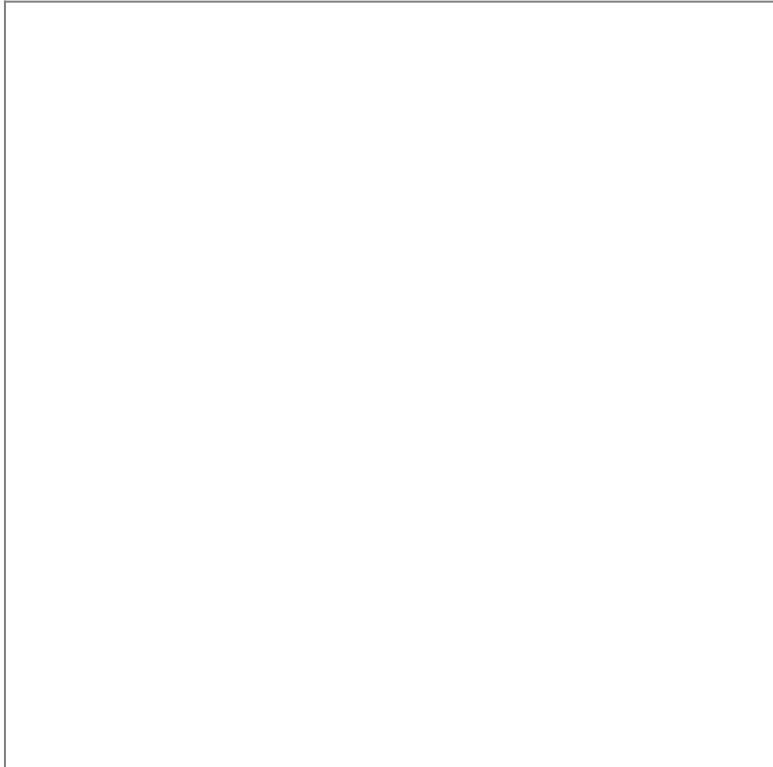
6. Select the desired **Channel**.

7. Click **Connect**.

Result: VOS discovers the input source after a few seconds. If it cannot find the input source, the following message will appear: No data found. Please check your source.

8. Choose a program from the list and, optionally, click **Play** to view the video source.

9. **Result:** If any issues with the transport stream are detected, then a **Grooming needed** alert appears.



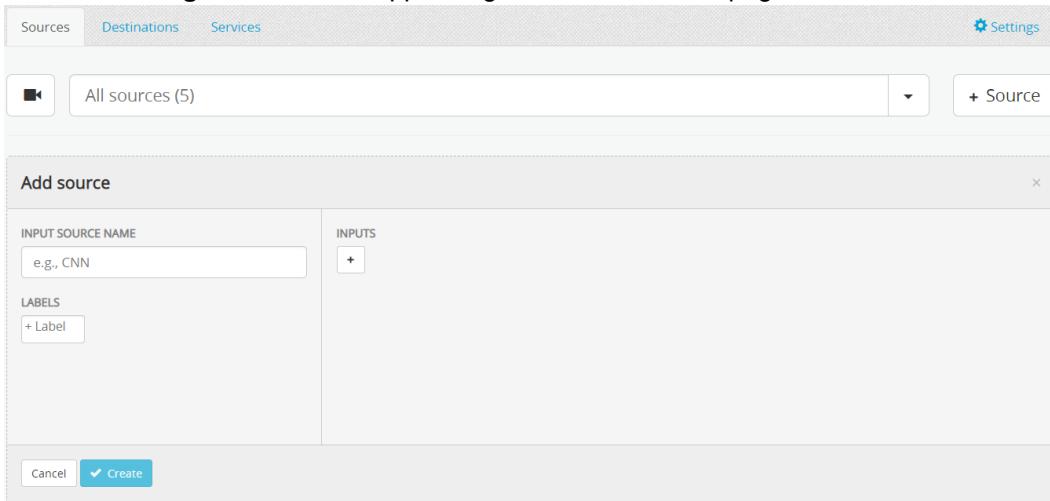
10. If grooming is needed, proceed with grooming the source input.

11. From the **Add source** pane, click **Create** to add the source.

Configuring an HSP source input

You can use HSP (Harmonic Stream Protocol) as a live source input to create a new channel that can be used with playout.

- From the **Configure Channels** app, navigate to the **Sources** page, click **+ Source**.



- In the **Input Source Name** field, enter the name of the new source.
- If you wish to be able to filter by user-defined labels, enter a label in the **Labels** field.
- Below **Inputs**, configure the **Signal Loss** input by doing one of the following:
 - Select the desired **Signal lost image**.
 - Click the **Display a black screen** toggle to display a black screen during signal loss.
 - Click **Remove** to delete the input if it is not required.

Note that signal loss is only supported in workflows that include transcoding.
- Click the **+ Input** icon, and then select **HSP**.
- Configure the HSP Input Mode:
 - Push:** No configuration is required. The endpoint URL is generated automatically for push packaging.
 - Pull:** Specify the endpoint URL to pull the source content from.
- (Optional) Add the **Watermark** from the drop-down menu by clicking the "**+Input**" button. The Watermark inputs are also displayed in the HSP input.
- Click **Connect** to groom the source input.

Configuring a baseband source input

- [Configuring the SMPTE 2022-6 source input](#)
- [Configuring the SMPTE 2110 source input](#)

Configuring the SMPTE 2022-6 source input

SMTPE 2022-6 sources are supported as baseband input. In addition, input redundancy can be enabled that two input streams (Primary/Backup) can be generated from the same SMPTE 2022-6 source when SMPTE 2022-7 redundancy is activated.

⚠ Ensure that the multicast IP and port do not conflict with other network services and that your network is correctly configured (IGMP querier).

- From the **Configure Channels** app, navigate to the **Sources** page, click **+ Source**.

The screenshot shows the 'Add source' dialog box. In the 'INPUT SOURCE NAME' field, 'e.g., CNN' is entered. Under 'LABELS', there is a '+ Label' button. The 'INPUTS' section includes fields for 'BASEBAND TYPE' (set to 'SMPTE 2022-6') and 'RANK' (set to 'Primary'). Below this are fields for 'IP ADDRESS' (e.g., 226.1.1.1), 'PORT' (e.g., 80), 'SSM' (with a dropdown menu showing 'e.g., SSM'), and '2022-7' (with a dropdown menu showing 'OFF'). There are also 'Video Stream' settings for 'FRAME RATE' (1:25) and 'RESOLUTION' (1920x1080). The 'ACTIVE REGION SOURCE' is set to 'SMPTE 2016' and the 'AFD FALBACK' is set to 'AFD=8 (full frame)'. Under 'Data Grooming', there is a '+ Create' button. Under 'Audio Grooming', there is a 'Create' button and a 'Remove' button. At the bottom of the dialog are 'Cancel' and 'Create' buttons, where 'Create' is highlighted.

- In the **Input Source Name** field, enter the name of the new source.
- If you wish to be able to filter by user-defined labels, enter a label in the **Labels** field.
- Below **Inputs**, configure the **Signal Loss** input by doing one of the following:
 - Select the desired **Signal lost image**.
 - Click the **Display a black screen** toggle to display a black screen during signal loss.
 - Click **Remove** to delete the input if it is not required.

Note that signal loss is only supported in workflows that include transcoding.
- Click the **+Input** icon, and then select **Baseband Type** as SMPTE 2022-6.
- Configure the following:
 - Rank:** This is used if multiple outputs are configured.
 - Enter the multicast source IP address.

Result: The **Network** field appears, allowing you to select the subnet from which you expect to receive the multicast source.

 - Enter the multicast source **Port** number.
 - Optionally, add a source-specific multicast IP address in the **SSM** field.
 - Optionally, turn on **SMPTE 2022-7** to generate two streams with the same data using different routes to the destination (use SMPTE 2022-7 redundancy to add a backup input stream).

⚠ SMPTE 2022-7 (“Seamless Protection Switching”) specifies the reconstruction of the original stream in case packets are lost in any of the paths. Switching from one path to the other occurs without impact on the content of the stream.

IP ADDRESS	PORT	SSM	2022-7
e.g., 226.1.1.1	e.g., 80	+ SSM	ON
e.g., 226.1.1.1	e.g., 80	+ SSM	

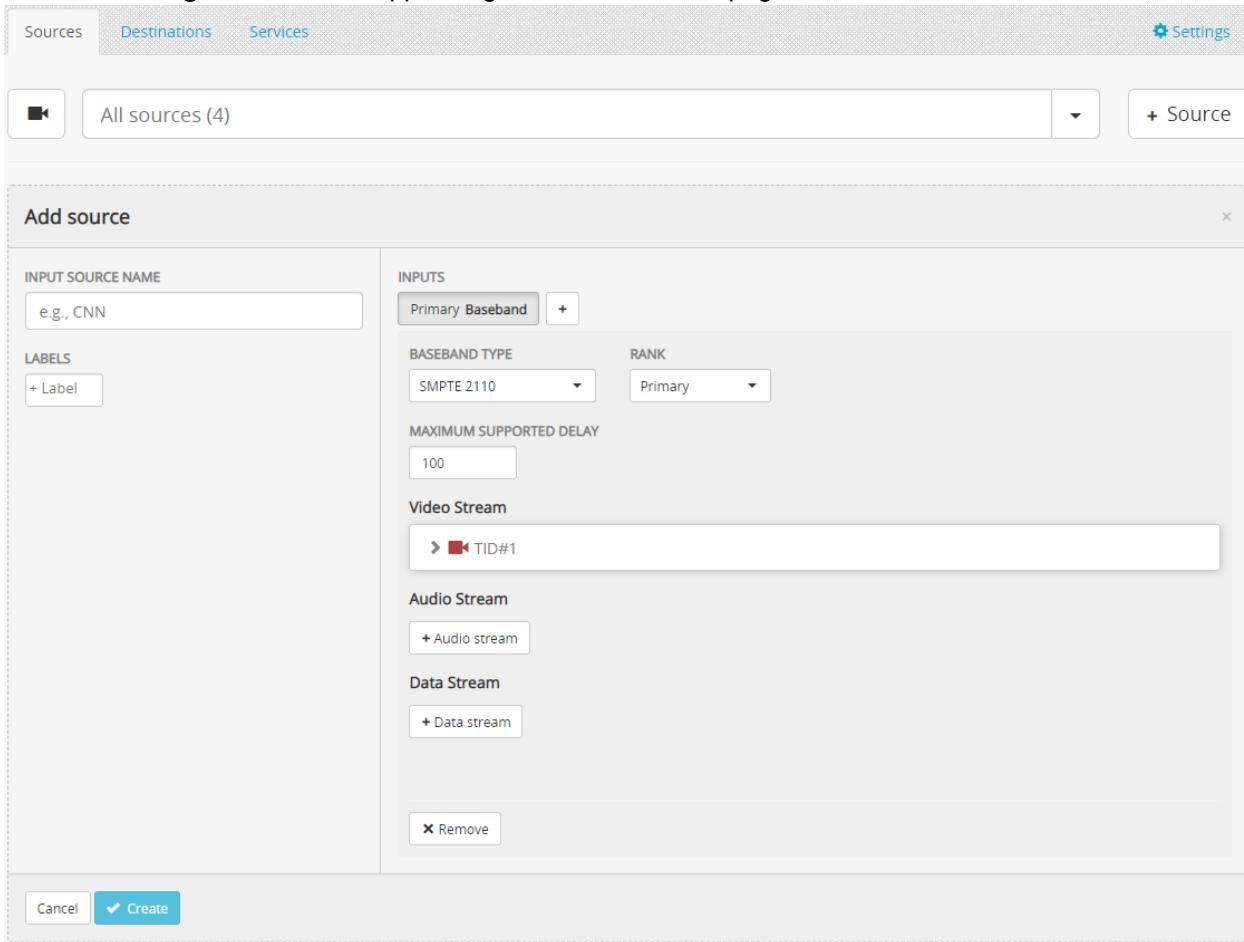
7. Under **Video Stream**, select the **Frame Rate**, **Resolution** and associated **Active Region Source** (AFD) configurations for the source.
8. If the source contains data, such as SCTE-104, click **Data Grooming** to customize downstream processing.
 - **Input Line Settings:** Declare the data type here which is present in the data stream. The supported data types include SCTE-104, SMPTE 2031, OP 47, OP 42, VITC, VPS, WST, and WSS.
9. Optionally, under **Audio**, click **Create** to define the audio tracks, and then click **Save** to exit the **Audio Grooming** dialog.
 - Codec: Choose the audio codec for the track.
 - Delay: Specify the audio delay in milliseconds in order to synchronize the video stream. The valid range is from -500 to 500 ms.
 - Languages: The language of audio in source.
 - Channels: Each line corresponds to a specific set of audio.
 - Group: Choose according to source definitions.
 - Pair: Choose according to source definitions.
 - Type: Choose the audio type according to source destinations.
10. From the **Add source** pane, click **Create** to save the source.

Configuring the SMPTE 2110 source input

SMPTE 2110 sources are supported as baseband input. In addition, input redundancy can be enabled that two input streams (Primary/Backup) can be generated from the same SMPTE 2110 source when SMPTE 2022-7 redundancy is activated.

⚠ Ensure that the multicast IP and port do not conflict with other network services and that your network is correctly configured (IGMP querier).

- From the **Configure Channels** app, navigate to the **Sources** page, click **+ Source**.



- In the **Input Source Name** field, enter the name of the new source.
- If you wish to be able to filter by user-defined labels, enter a label in the **Labels** field.
- Below **Inputs**, configure the **Signal Loss** input by doing one of the following:
 - Select the desired **Signal lost image**.
 - Click the **Display a black screen** toggle to display a black screen during signal loss.
 - Click **Remove** to delete the input if it is not required.

Note that signal loss is only supported in workflows that include transcoding.
- Click the **+Input** icon, and then select **Baseband Type** as SMPTE 2110.
- Configure the following parameters:
 - Maximum Supported Delay:** This is used for the maximum supported delay between the SMPTE 2110 streams. The maximum value is 2000.
 - Rank:** This is used if multiple outputs are configured.
- Under **Video Stream**, configure the following:
 - Enter the multicast source IP address.
Result: The **Network** field appears, allowing you to select the subnet from which you expect to receive the multicast source.
 - Enter the multicast source **Port** number.
 - Optionally, add a source-specific multicast IP address in the **SSM** field.

- d. Optionally, turn on SMPTE **2022-7** to generate two streams with the same data using different routes to the destination (use SMPTE 2022-7 redundancy to add a backup input stream).

⚠ SMPTE 2022-7 (“Seamless Protection Switching”) specifies the reconstruction of the original stream in case packets are lost in any of the paths. Switching from one path to the other occurs without impact on the content of the stream.

IP ADDRESS	PORT	SSM	2022-7
e.g., 226.1.1.1	e.g., 80	+ SSM	ON
RTP PAYLOAD TYPE			
0			
e.g., 226.1.1.1	e.g., 80	+ SSM	

- e. Optionally, configure the following parameters:

- RTP Payload Type: The dynamic payload of the RTP streams.
- Frame Rate: The discovered frame rate of the input video.
- Resolution: The discovered resolution of the input video.
- Frame Mode: The input video standard.
- Active Region Source: The action region with the SMPTE 2016 standard.
- AFD Fallback: Fallback if there is no ADF signal at all or AFD is lost.
- Image Compression: The image compression format for the input video.

8. Optionally, under **Audio Stream**, click **+Audio Stream** to configure the following:

- a. Enter the multicast source IP address.

Result: The **Network** field appears, allowing you to select the subnet from which you expect to receive the multicast source.

- b. Enter the multicast source **Port** number.

- c. Optionally, add a source-specific multicast IP address in the **SSM** field.

- d. Optionally, turn on SMPTE **2022-7** to generate two streams with the same data using different routes to the destination (use SMPTE 2022-7 redundancy to add a backup input stream).

⚠ SMPTE 2022-7 (“Seamless Protection Switching”) specifies the reconstruction of the original stream in case packets are lost in any of the paths. Switching from one path to the other occurs without impact on the content of the stream.

- e. Optionally, configure the following parameters:

- RTP Payload Type: The dynamic payload of the RTP streams.
- Num Channel: No. of audio channels in the input stream.
- 2110-31: Whether or not payload within the audio stream is SMPTE 2110-31.

- f. Optionally, under **Audio Tracks**, click **Create** to define the audio tracks, and then click **Save** to exit the **Audio Grooming** dialog.

- Codec: Choose the audio codec for the track.

- Delay: Specify the audio delay in milliseconds in order to synchronize the video stream. The valid range is from -500 to 500 ms.
 - Languages: The language of audio in source.
 - Channels: Each line corresponds to a specific set of audio.
 - Group: Choose according to source definitions.
 - Pair: Choose according to source definitions.
 - Type: Choose the audio type according to source destinations.
9. Optionally, under **Data Stream**, click **+Data Stream** to configure the following:
- a. Enter the multicast source IP address.
Result: The **Network** field appears, allowing you to select the subnet from which you expect to receive the multicast source.
 - b. Enter the multicast source **Port** number.
 - c. Optionally, add a source-specific multicast IP address in the **SSM** field.
 - d. Optionally, turn on **SMPTE 2022-7** to generate two streams with the same data using different routes to the destination (use SMPTE 2022-7 redundancy to add a backup source).
- ⚠** SMPTE 2022-7 (“Seamless Protection Switching”) specifies the reconstruction of the original stream in case packets are lost in any of the paths. Switching from one path to the other occurs without impact on the content of the stream.
- e. Optionally, configure the following parameters:
 - RTP Payload Type: The dynamic payload of the RTP streams.
 - Extract AFD: Whether or not to extract AFD from the SMPTE 2110 source.
- ⚠** The Active Region Source under Video Streams needs to be configured as SMPTE 2016. Only one 2110 data stream should have “Extract AFD” set to true.
- f. If the source contains data, such as SCTE-104, click **+Data Track** to customize downstream data processing.
 - Input Line Settings: Declare the data type here which is present in the data stream. The supported data types include SCTE-104, SMPTE 2031, OP 47, OP 42, VITC, VPS, WST, and WSS.

Configuring NMOS adapter for IS-04/IS-05 communication to NMOS controller

For the SMPTE 2110 source input, you can register the VOS Cloud-Native Software itself as an NMOS node using IS-04 and allow NMOS IS-05 to provision the input source.

1. From the **Configure Channels** app, click **Settings** at the top right corner of the screen.

2. Navigate to the **Advanced** tab to enable the **NMOS** checkbox.

NMOS — Enable NMOS adapter for IS-04/IS-05 communication to NMOS controller

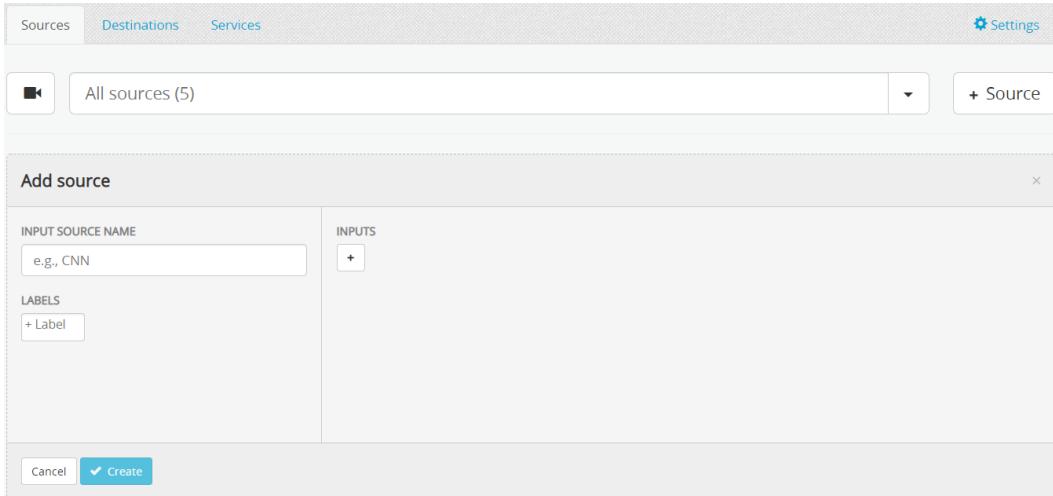


3. From the **Configure Channels** app, navigate to the **Sources** page , click **+ Source**.
4. Click the **+Input** icon, and then select **Baseband Type** as SMPTE 2110.

5. Turn **NMOS** to On.
6. Configure the parameters (Refer to [Configuring the SMPTE 2110 source input](#) for details).

Configuring a SRT source input

- From the **Configure Channels** app, navigate to the **Sources** page, click **+ Source**.



- In the **Input Source Name** field, enter the name of the new source.
- If you wish to be able to filter by user-defined labels, enter a label in the **Labels** field.
- Below **Inputs**, configure the **Signal Loss** input by doing one of the following:
 - Select the desired **Signal lost image**.
 - Click the **Display a black screen** toggle to display a black screen during signal loss.
 - Click **Remove** to delete the input if it is not required.

Note that signal loss is only supported in workflows that include transcoding.
- Click the **Add Input** icon and then select **SRT**.
- Configure the following settings:

IP Address	IP address of the live source (filled by VOS).
Port	Port used by the live source (filled by VOS).
Latency	<p>The value must be an integer in milliseconds between 20 and 8000 ms (i.e. min. 20 ms, max. 8000 ms), the default value is 1000 ms.</p> <p>The latency parameter is applied to SRT Caller (Pull) and Listener (Push) inputs.</p>
Decryption Type	Set to No encryption .

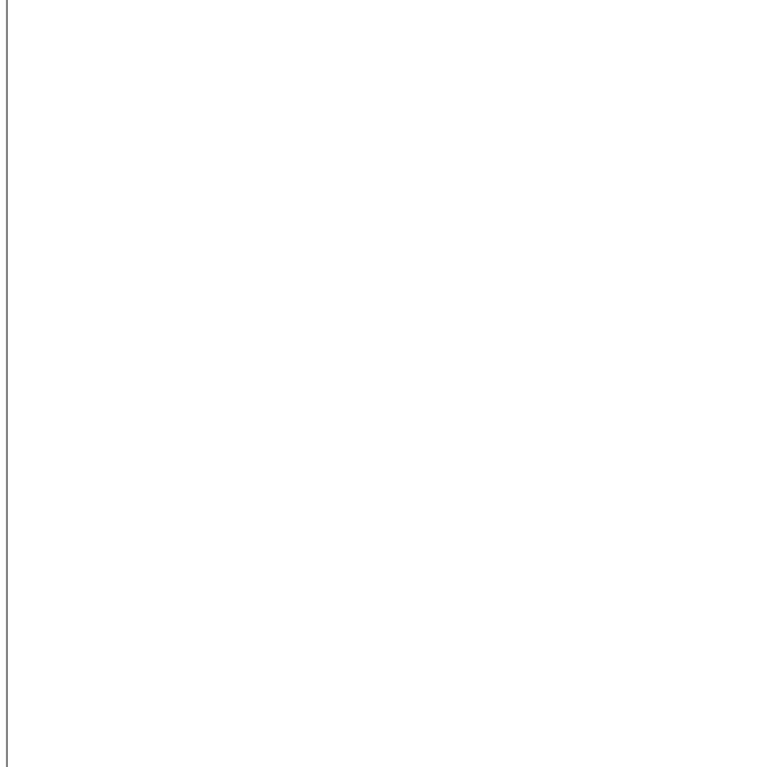
Connection Mode	<p>Listener (Push): No configurations required.</p> <p>Caller (Pull): Fill in the IP Address and Port if the Caller (Pull) mode is selected. The Caller (Pull) mode can be used for enabling SRT failover/path redundancy - SRT Path Redundancy for a transition between inputs in case of input loss.</p> <div style="border: 1px solid #fca; padding: 5px; margin-top: 10px;"> ⚠️ 1+1 geo-redundancy supports SRT Caller (Pull) & Listener (Push) enabled source. </div>
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7. (Optional) In addition to the Primary source input, you can create a secondary input for the same SRT source (e.g. 2nd SRT) as redundancy by clicking the **+** button and selecting **SRT**.

⚠️ Note that the Caller Connection Mode needs to be configured for both the Primary and Secondary inputs.

8. Click **Connect**.
- Result:** VOS discovers the input source after a few seconds. If it cannot find the input source, the following message will appear: No data found. Please check your source.
9. Choose a program from the list and, optionally, click **Play** to view the video source.

Result: If any issues with the transport stream are detected, then a **Grooming needed** alert appears.



10. If grooming is needed, proceed with grooming the source input.
11. (Optional)

- From the **Add source** pane, click **Create** to add the source.

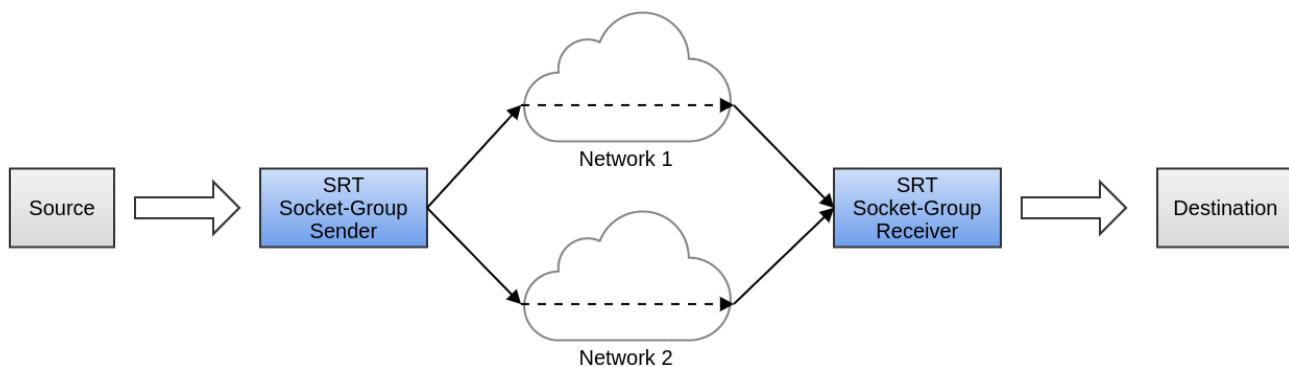
Related information

[Configuring the source with SRT path redundancy](#)

Configuring the source with SRT path redundancy

The SRT Path Redundancy feature is used for increasing total stream robustness. It supports multiple connections between peers with the same stream transferring simultaneously but via different network paths.

Below is the workflow for SRT path redundancy:



- From the **Configure Channels** app, navigate to the **Sources** page, click **+ Source**.
- Click the **Add Input** icon and then select **SRT**.
- Configure the following settings:

IP Address	IP address of the live source (filled by VOS).
Port	Port used by the live source (filled by VOS).
Latency	<p>The value must be an integer in milliseconds between 20 and 8000 ms (i.e. min. 20 ms, max. 8000 ms), the default value is 1000 ms.</p> <p>The latency parameter is applied to SRT Caller (Pull) and Listener (Push) inputs.</p>
Decryption Type	Specify the Decryption Type and Decryption Key for the input if needed.

**Conn
ection
Mode**

Use the **Caller (Pull)** mode to enable SRT failover/path redundancy - SRT Path Redundancy for a transition between inputs in case of input loss.

- Click the **Create** button without **Connect**.

⚠ Need to configure the connection SRT settings via REST API first and discover the source later.

- Navigate to the **Public API** app.
- From the **Configure Source**, navigate to **GET/configure/v1/source**,
- Under **Parameters**, specify the Source Name you just created in the field **Filter By Name** to find out the ID number of the Source you wish to update and click **Try it out!**.
- From the **Configure Source**, navigate to **PUT/configure/v1/sources/{id}**.
- Under **Parameters**, update the source as follows:

Parameter	Value
source	<pre>"sourcePort": 0, "sourcePortRangeEnd": 0, "srtConnectionSettings": [{ "ipAddress": "192.168.1.1.10", "port": 44500 }, { "ipAddress": "192.168.1.1.20", "port": 44500 }]</pre>
Parameter content type:	application/json
id	3e2987e4-5f5a-4aa3-a0e6-6fb88c7db900

Add to **srtSettings** of SRT Input **srtConnectionSettings** list of pairs addresses and ports, where:

- ipAddress** - the address of one of physical interfaces on the Streamer side (can be unresolved ip address).
- port** - the corresponding port on which Streamer is expected to obtain connection.

⚠ For enabling the SRT Path Redundancy feature, it is required to have at least 2 pairs of ipAddress/port in the srtConnectionSettings list.

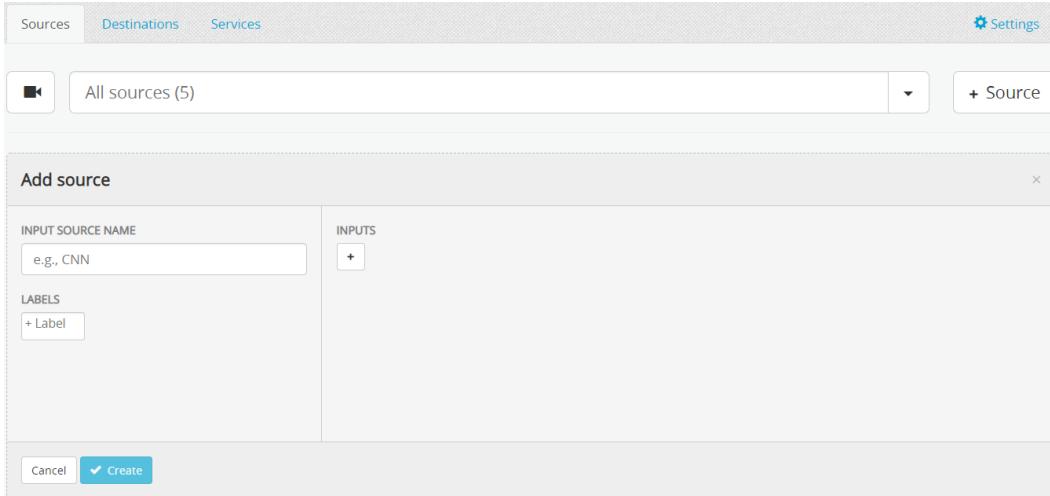
- Specify the **id** of the source and click **Try it out!**.
- Navigate back to **Configure Source** app.

12. Choose the corresponding source and click **Connect** to check and discover the source with SRT path redundancy enabled.

Configuring an RTMP source input

You can use RTMP as a source input to create a new channel.

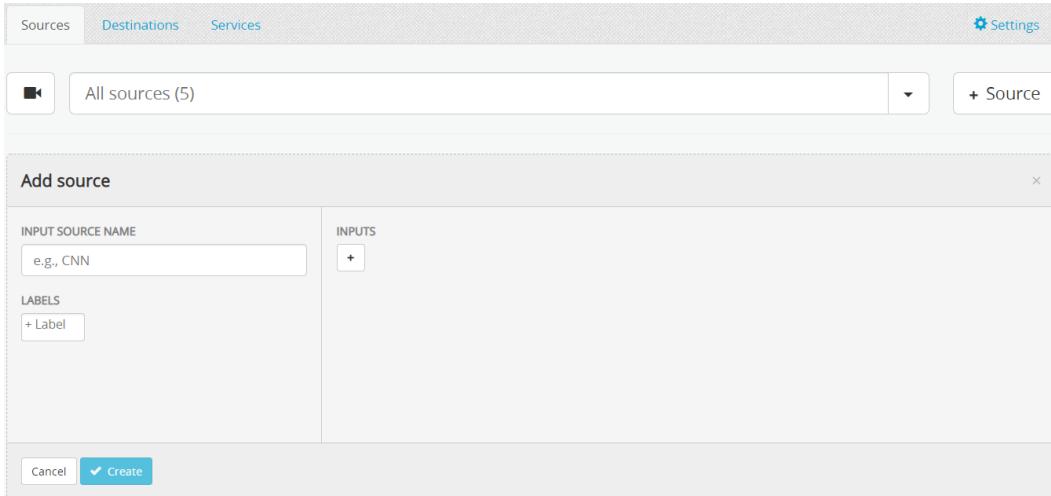
1. From the **Configure Channels** app, navigate to the **Sources** page, click **+ Source**.



2. In the **Input Source Name** field, enter the name of the new source.
3. If you wish to be able to filter by user-defined labels, enter a label in the **Labels** field.
4. Below **Inputs**, configure the **Signal Loss** input by doing one of the following:
 - a. Select the desired **Signal lost image**.
 - b. Click the **Display a black screen** toggle to display a black screen during signal loss.
 - c. Click **Remove** to delete the input if it is not required.Note that signal loss is only supported in workflows that include transcoding.
5. Click the **Add Input** icon and then select **RTMP**.
Result: The endpoint URL is generated automatically for push packaging.
6. Click **Connect** to groom the source input.

Configuring a Zixi source input

- From the **Configure Channels** app, navigate to the **Sources** page, click **+ Source**.



- In the **Input Source Name** field, enter the name of the new source.
- If you wish to be able to filter by user-defined labels, enter a label in the **Labels** field.
- Below **Inputs**, configure the **Signal Loss** input by doing one of the following:
 - Select the desired **Signal lost image**.
 - Click the **Display a black screen** toggle to display a black screen during signal loss.
 - Click **Remove** to delete the input if it is not required.

Note that signal loss is only supported in workflows that include transcoding.
- Click the **Add Input** icon and then select **Zixi**.
- Configure the following settings:

IP Address	IP address of the live source (filled by VOS).
Port	Port used by the live source (filled by VOS).
Decryption Type	Set to None .
Zixi Input Mode	Push : No configurations required. Pull : For the <i>Channel Name</i> , <i>Session ID</i> , <i>Password</i> fields, fill in the respective configurations from the Zixi encoder.

- Click **Connect**.

Result: VOS discovers the input source after a few seconds. If it cannot find the input source, the following message will appear: No data found. Please check your source.

- Choose a program from the list and, optionally, click **Play** to view the video source.

Result: If any issues with the transport stream are detected, then a **Grooming needed** alert appears.



- If grooming is needed, proceed with grooming the source input.
- From the **Add source** pane, click **Create** to add the source.

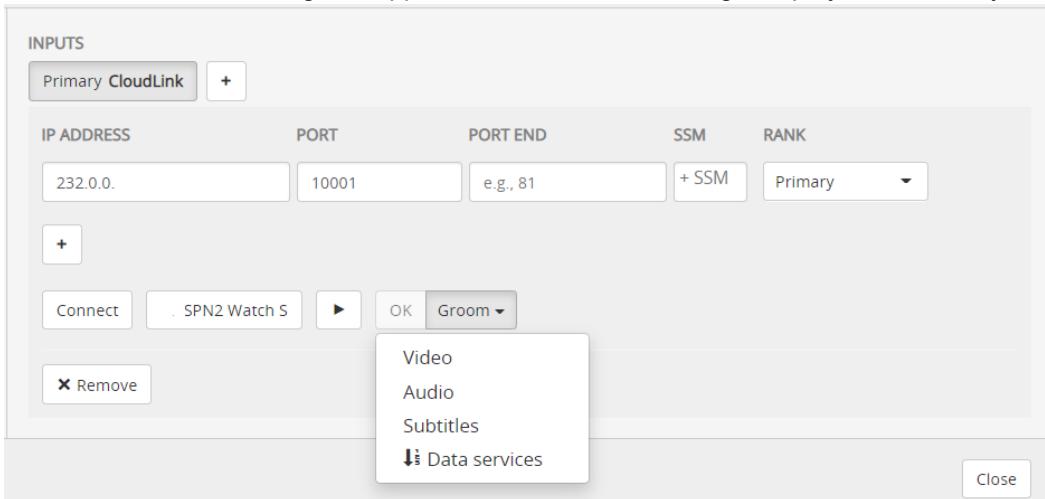
Grooming the source input

Groom a source to supply metadata that is missing or corrupt. For example, an audio track might be missing its language identifier.

- ⚠** Ensure that the languages required by your services are activated in the VOS system. Even if the language codes (ISO639) are correctly set in the sources, the system will not display them in the grooming window if they are not activated and they will not be available in the streams generated by the system. Manage language settings from **Configure Channels > Settings**.

- From the **Add source** pane, click the **Groom** drop-down list and then select **Video**.

Result: The **Groom** dialog box appears and the video will begin to play automatically.



- Configure settings on the **Video tab**.
- Once you have verified the video input, click the **Audio tab** and select the audio language you wish to use for each track.
- Provide information as needed on the **Subtitles tab**.
- Provide information as needed on the **Data Services tab**.
- When you have finished grooming the source input, click **OK** to exit the **Groom** dialog.
- Continue with creating and activating the source.

Related information

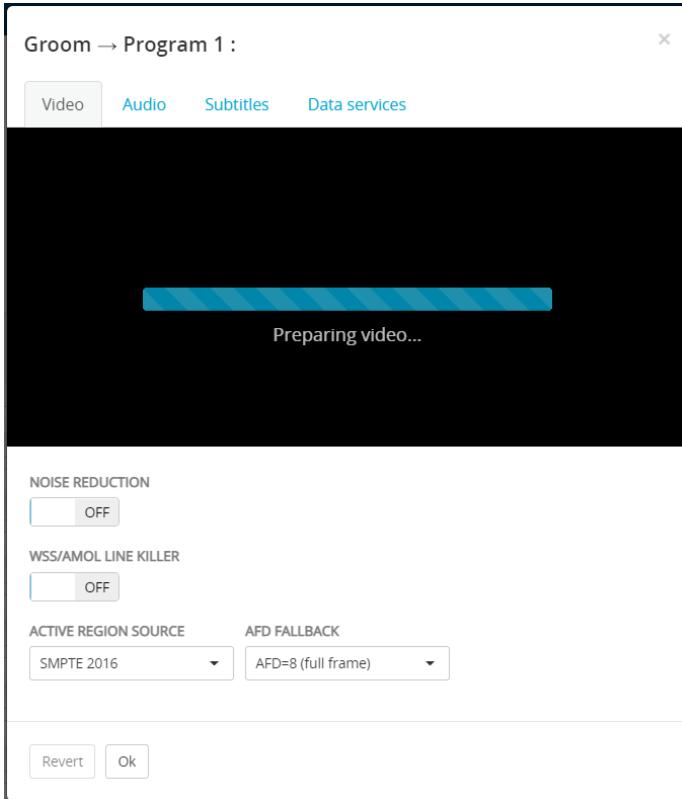
[IPTV profile parameters](#)

[Multiscreen profile parameters](#)

Video grooming dialog

Review the video grooming dialog for options available for your services.

Video grooming dialog

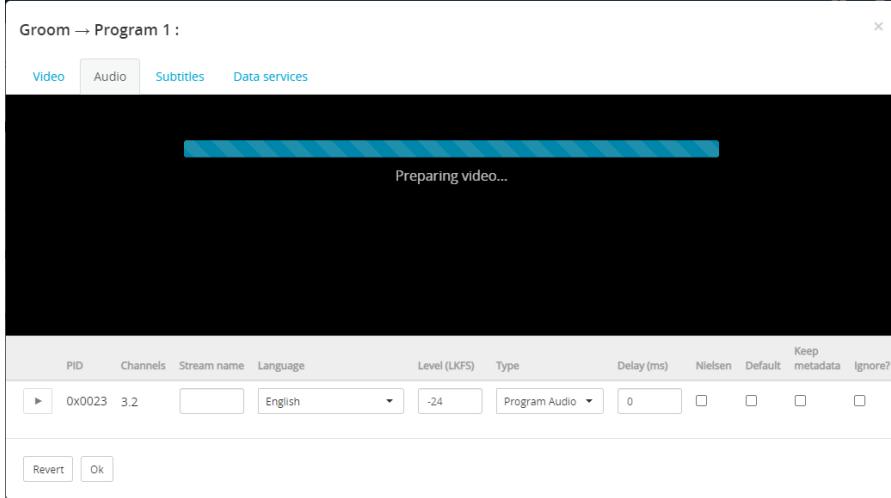


Noise Reduction	Enable to reduce the noise from the source video. Options: Auto, Disabled, Moderate, Strong.
WSS/AMOL Line (Killer)	Enable to remove the widescreen signaling (WSS) or automated measurement of lineups (AMOL) lines at the top of older analog video streams. These lines are normally visible as thin white lines at the top of video streams. This replaces the line with a mix of the following two lines to remove the signal.
Active Region Source	Select the standard of the active region from the source video. The SMPTE 2016 standard is supported.
AFD Fallback	Specify how VOS performs aspect ratio conversion based on AFD codes.
Input Aspect Ratio	This is used to determine whether there has been an aspect ratio change, and therefore whether VOS needs to modify the content.

Audio grooming dialog

Review the audio grooming dialog for options available for your services.

Audio grooming dialog



Stream name	<p>Specify a custom textual description of the content of the audio track. This textual description is expected to be used in the client UI for audio stream selection.</p> <p>It will be inserted as "label" to the DASH manifest, for DASH Live/Start-Over/Catch-Up services. This DASH "label" provides additional description of the audio track in addition to the existing Language configured. It is useful to differentiate the audio tracks with the same language configured or audio tracks with no language (e.g. "Instrumental").</p> <div style="border: 1px solid #fca; padding: 10px; margin-top: 10px;"> <p>⚠ Leave this Stream Name blank if no need to have labels inserted to the DASH manifest for differentiating audio tracks.</p> </div>
Language	Configure the audio language.
Level (dbFS)	Configure the audio level. The default value is -24 dBFS.
Type	Configure the audio type.

Delay (ms)	Specify the audio delay in milliseconds in order to synchronize with the video stream. The valid range is from -500 to 500 ms.
Nielsen	Enable / disable Nielsen ID3 watermarks (used to measure live and on-demand viewing on multiple device types).
Default	Indicate the default stream.
Keep metadata	Keep the metadata in the audio stream for the AC3 (Dolby Digital) and E-AC3 (Dolby Digital Plus) stream types.
Ignore?	Enable / disable the stream.

Subtitles grooming dialog

Review the subtitles grooming dialog for options available for your services.

Subtitles grooming dialog

The screenshot shows the 'Groom → Program 1' dialog with the 'Subtitles' tab selected. The table lists four subtitle streams (CC-1 to CC-4) for PID 0x0022, all identified as 'Closed Caption'. Each row includes fields for Stream name, Page, Language (dropdown), Default (checkbox), and Ignore? (checkbox). The 'Language' dropdown for CC-1 is set to English, while CC-2 is set to Spanish. All other fields are empty or have their respective checked status. A 'Preferred CC type' dropdown is at the bottom left, and 'Revert', 'Ok', and 'Save as default' buttons are at the bottom right.

PID	Type	Stream name	Page	Language	Default	Ignore?
0x0022	Closed Caption		CC-1	English	<input type="checkbox"/>	<input checked="" type="checkbox"/>
0x0022	Closed Caption		CC-2	Spanish	<input type="checkbox"/>	<input checked="" type="checkbox"/>
0x0022	Closed Caption		CC-3	English	<input type="checkbox"/>	<input checked="" type="checkbox"/>
0x0022	Closed Caption		CC-4	English	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Preferred CC type ▾

Revert Ok Save as default

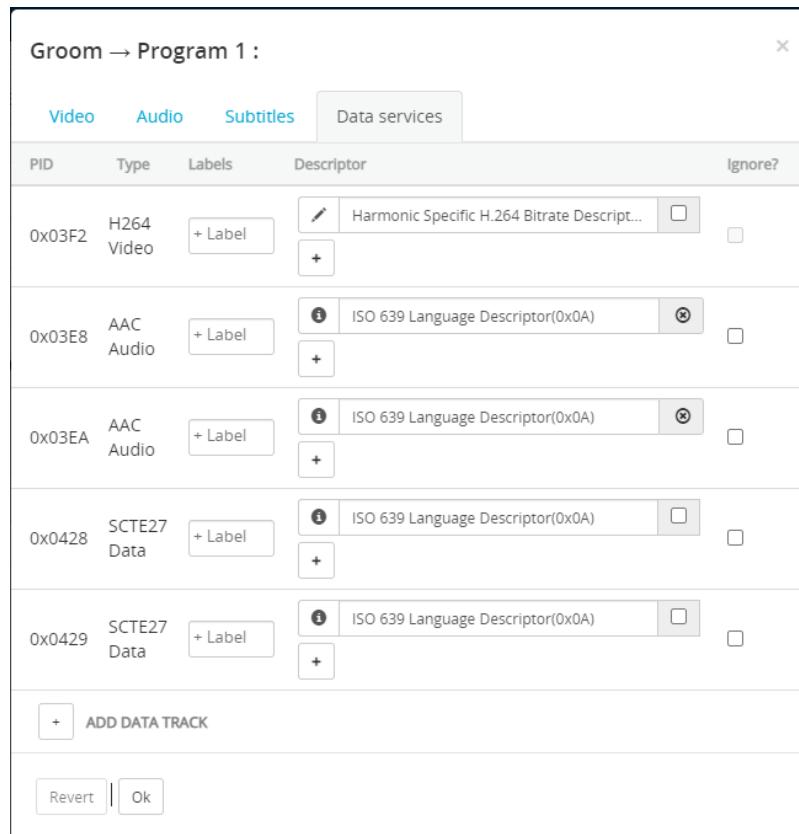
Type	<p>This refers to the subtitle types in the input stream.</p> <p>The subtitle types are extracted from the data descriptors included in the source or the data descriptors manually added in the "Data services" tab.</p> <p>The possible values are: "Closed Caption", "Teletext", "DVB TTML", "DVB Subtitling" and "SCTE27 Subtitling".</p>
Subtitle Type	<p>This refers to specific forms of subtitle, as indicated in the source descriptor.</p> <p>The detected value can be modified by selecting a different value in the dropdown list.</p> <p>This type is converted into the corresponding signalling for each output packaging format.</p> <ul style="list-style-type: none"> For DVB-TTML the possible values are: "same-lang-dialogue", "other-lang-dialog", "all-dialogue", "hard-of-hearing", "other-lang-dialogue-with-hard-of-hearing", "all-dialogue-with-hard-of-hearing", "audio-description", "content-related-commentary". For Teletext the possible values are: "Normal", "Hearing Impaired".
Stream Name	<p>Specify a custom subtitle stream name during live stream source grooming, for Live services. This custom stream name will then be used as the DASH "label" for DASH packaging to provide additional description of the subtitle track in addition to the existing 'lang' code.</p> <p>The value of custom stream name can be any UTF-8 character string (i.e. it is compatible with Arabic, Cyrillic, Japanese, Chinese, Hebrew... character sets and not just the Latin ones).</p> <div style="border: 1px solid #fca; padding: 10px; margin-top: 10px;"> <p>⚠ Leave this Stream Name blank if no need to have labels inserted to the DASH manifest for differentiating subtitle tracks.</p> </div>
Page	<p>For DVB subtitles, confirm the page ID. For Teletext, confirm the Page Number. The default values are the ones extracted from the data descriptors included in the source.</p>
Language	<p>Select the subtitle language you wish to use for each track. The default language is the one extracted from the language descriptor included in the source.</p>

Default	Optionally, check it to select the preferred language for the first subtitle stream in this source. Smooth Streaming players will use this as the default.
Ignore?	Select if you wish to exclude the track from the output.
Preferred CC type	If closed captions are detected in the input stream, this drop-down menu will be displayed. When set to Auto , VOS will use CEA-708 by default and switch to EIA-608 if the preferred CEA-708 is not present in the stream.

Data Services grooming dialog

Review the data services grooming dialog for options available for your services.

Data Services grooming dialog



Type	This refers to the service types in the input data stream. The types of media component are directly extracted from the descriptors included in the source.
Label	This refers to a typical label (e.g. audio_1, SCTE-35) that can be assigned to the output audio stream. This is required if your transcoding profiles are configured for stream-based audio conversion (as opposed to language-based audio conversion).
Descriptor	Add/edit descriptors for each PID in the input stream. <div style="border: 1px solid #f0e68c; padding: 10px; margin-top: 10px;"> ⚠ Teletext subtitle <p>Teletext subtitle tracks must have the Teletext Descriptor in order for VOS to convert them to the proper OTT subtitles.</p> </div>
Ignore?	Select if you wish to exclude the track from the output.

Configuring a destination

You need to configure an output destination before creating and activating a service.

Refer to the following pages for details:

Service type	References
IPTV service	How to configure the IPTV/Broadcast destination
ATS service	Configuring the ATS destination
Multiscreen service	How to configure a multiscreen service destination
Packaging-only service	Configuring a packaging-only service destination
Mux service	Configuring the mux destination

Configuring a service

Configuring an IPTV service

IPTV services are delivered over IP as transport streams. In an IPTV setup, operators receive compressed streams from content providers via satellite, terrestrial broadcast and IP circuits. These incoming video services will be groomed and transcoded by VOS for delivery to set-top boxes in HD and SD and connected devices.

The video and audio elements inside the transport streams can contain the following codecs:

- Video: AVC, HEVC
- Audio: MPEG-1 L2, AAC, Dolby

Configuring source input for an IPTV service

When you add a new source, VOS discovers the properties of the source and returns detailed information about it. The source can then be used to configure a service.

 You can use a source in more than one service.

- [Supported input types](#)
- [Configuring source input](#)
- [Grooming the source input](#)

Configuring the IPTV/Broadcast destination

You can configure an IPTV/Broadcast service destination to use IP, CloudLink, Zixi and SRT output. Additionally, you can create a DiviTrack/Statmux pool for the IPTV/Broadcast destination output.

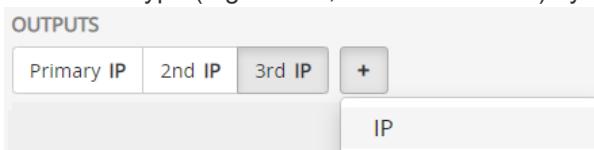
Before you begin

[Configuring a source input](#)

- From the **Configure Channels** app, navigate to the **Destinations** page, click **+ Destination**.

The screenshot shows the 'Add destination' dialog box. It includes fields for Destination Name (e.g., LimeLight), Type (Broadcast), Profile (IPTV Destination v.1), and Labels (+ Label). The Outputs section displays Primary IP (IP address e.g., 226.1.1.1, port e.g., 80) and Secondary IP (IP address e.g., 226.1.1.1, port e.g., 80). Buttons at the bottom include 'Cancel' and 'Create'.

- For **Destination Name**, type the name of the destination.
- For the **Type** of destination the service will have, select **Broadcast**.
Result: The default output type **IP** is selected under **Outputs**.
- Select the desired destination **Profile** from the drop-down list.
- If you wish to be able to filter destinations according to user-defined labels, enter one or more labels for the destination.
- If you wish to use an output that is different from the default, click **Remove output** and then click **+Output** and select the desired output type from the list.
IPTV/Broadcast destinations use IP, DiviTrack Pool, CloudLink, Zixi, SRT, Cloud and Relay (HSP) outputs.
- (Optional) In addition to the Primary destination output, you can create additional outputs for the same destination type (e.g. 2nd IP, 3rd IP and so on) by clicking **+Output**.



- Configure the general settings for the Outputs section:

IP address	Enter the multicast IP address for the egress output streams.
Port	Enter the port number for the egress output streams.
Source IP address	Enter the virtual source IP address for the egress output streams.

Port	Enter the virtual source UDP port for the egress output streams.
Rank	Used if multiple outputs are configured.
Status	<p>Determine how outputs are paired for redundancy:</p> <ul style="list-style-type: none"> • Mandatory output is active. • Standby output is muted. • Disabled output remains inactive until the status is changed to Standby or Mandatory using the VOS REST API or UI. <p>The first Mandatory output will be paired with the first Standby output, and so on.</p>
Output Monitor	If the service will be encrypted and you want to be able to monitor clean video output, select Output Monitor and provide the delivery IP address and Port for monitoring.

9. For IPTV/Broadcast output with **DiviTrack Pool** destination, refer to [Creating a DiviTrack/Statmux pool for IPTV/Broadcast destination](#).
10. For IPTV/Broadcast output with **CloudLink** destination, select the name of the downlink CloudLink.
11. For IPTV/Broadcast output with **Zixi** destination, use the default Zixi settings or configure the custom Zixi settings:

Encryption Type	Choose an encryption standard, or select None .
Channel Name	Enter a channel name that will also be used in the receiver configuration.
FEC Overhead (%)	FEC overhead in % over the source bitrate. The default value is 20%.
FEC Block (ms)	Maximum time of the FEC block, in milliseconds. The default value is 10 ms.
Max Latency (ms)	Maximum latency for error correction, in milliseconds. The default value is 1501 ms. <div style="border: 1px solid #fca; padding: 5px; margin-top: 10px;"> ⚠ You must enter a value greater than 1500 ms. </div>
Timeout (ms)	Connection timeout, in milliseconds. The default value is 10000 ms.

12. For IPTV/Broadcast output with **SRT** destination, use the default SRT settings or configure the custom SRT settings:

Encryption Type	Choose an encryption standard, or select None .
Channel Name	Enter a channel name that will also be used in the receiver configuration.
Bandwidth Overhead (%)	The Bandwidth Overhead is the percentage of the Average Bandwidth used to accommodate SRT controls. The default value is 20%.
Latency (ms)	Sending packets over a (usually unpredictable) network could result in time delay. SRT Latency is a fixed value (min. 0 ms, no max. value) representing the maximum buffer size available for managing SRT packets. The default value is 1000 ms.
Timeout (ms)	Connection timeout, in milliseconds. The default value is 10000 ms.
Blocking Mode	When blocking mode is enabled, the SRT function will not exit until the availability condition is satisfied. In non-blocking mode the SRT function always exits immediately, and in case of lack of resource availability, it returns an error with appropriate code.

13. For IPTV/Broadcast output with **Cloud (Live Routing)** destination, the Cloud channel will be available as a source to be up-linked to the Harmonic's Cloud via Live Routing Service. This configuration is applicable to **VOS360** and need to have access to the Syndicate app only.
14. For IPTV/Broadcast output with **Relay (HSP)** destination, no custom configurations are required.
15. Click **Create**.

Related information

[Creating an IPTV destination profile](#)

[Creating a DiviTrack/Statmux pool for IPTV/Broadcast destination](#)

[Create a DiviTrack/Statmux Pool with designated bitrate for the IPTV/Broadcast destination output.](#)

- From the **Configure Channels** app, navigate to the **Destinations** page.

2. Click **Show Pools** and **+ DiviTrack Pool** on the left side of the screen.

3. From the Create DiviTrack Pool pop-up, fill in the Name and configure the desired bitrate.
 4. Click **+ Destination** on the top right corner of the screen.
 5. For **Destination Name**, type the name of the destination.
 6. For the **Type** of destination the service will have, select **Broadcast**.
- Result:** The default output type **IP** is selected under **Outputs**.
7. Verify that the selected **Profile** is a DIVITRACK destination profile.
 8. If you wish to be able to filter destinations according to user-defined labels, enter one or more labels for the destination.
 9. Click **Remove output** and then click **+Output** and select the **DiviTrack Pool** output type from the list.
 10. Configure the settings for the DiviTrack Pool.
 11. If **VBR** is selected, configure the range of the lowest to highest bitrate available for the output.
 12. (Optional, only for VBR) You may enable the **Still Picture Detection** option to reduce the bitrate when the input video is still and slate insertion takes place. The **Still Picture Bitrate** can be set below the lowest VBR bitrate configured for the statmux pool above.

⚠ The minimum bitrate for **Still Picture Bitrate** is 0.5 Mbps.

13. Click **Create**.

Related Information

[Configuring the mux destination](#)

Creating and activating an IPTV service

Select the transcoding profile, source, and destination to be used for the IPTV service and configure any service add-ons. Activate the service when it is ready for broadcast.

Before you begin

[Configuring a source](#)

[Configuring the IPTV/Broadcast destination](#)

IPTV services typically use an IPTV transcoding profile and IPTV destination, or a multiscreen transcoding profile with an ATS destination.

- From the **Configure Channels** app, navigate to the **Services** page, click **+ Service**.

Result: The **Create Service** wizard opens.



- On the **Profile** tab, select the transcoding profile the service will use, and then click **Next**.
- On the **Source** tab, select the name of the primary source, and optionally, an alternate source / tertiary source, and then click **Next**.

⚠ The input streams of the paired CloudLink instances must be identical.

- On the **Destination** tab, select the name of the destination from the **Destination** drop-down list and then click **Next**.
- If necessary, on the **Commit** tab, for **Program Number**, type a program number for the video channel.
- In the **Service Name** field, enter the name of the new service.
- Optionally, select the **Priority** drop-down menu for the service. Options are **Low**, **Normal**, or **High**. The default setting is Normal.

⚠ You can use this Priority tag to quickly view the status and configuration of the high-priority services (and other priorities as well) in case any service is down and requires manual attention.

- Optionally, turn the **Redundancy** setting to **On** to activate service-level redundancy.

ⓘ In Redundancy Mode, VOS creates two services for the same channel (active-standby), using the same configuration. In the event that the active service fails, stream processing or packaging tasks failover to the standby service.

⚠ Transcode services must have an alternate input source configured, or the service must use a paired CloudLink.

9. Optionally, turn the [Input Tracking](#) setting to **On** to activate the Input Service Tracking feature.
10. Optionally, turn the [Dynamic Program](#) setting to **On** to activate the dynamic program for the service.
11. Optionally, turn the [Source Failover](#) to **On** to activate source redundancy for the service.
12. Optionally, select the **Geo Redundancy** setting for the service. Options are **Auto**, **On**, or **Off**. The default setting is Auto.

⚠ If geo-redundancy is enabled on the VOS cluster, all services will be paired up between two VOS instances. This option allows pairing up partial services only instead of all services between two VOS instances for the geo-redundancy feature.

13. Select **Active** if you want the service to go online when you commit to the new service.
14. [Configure service add-ons](#) as required by the channel.
15. Optionally, turn the [Mute Notifications](#) setting to **On** to prevent the notifications from being noticed.

⚠ Geo-redundancy notifications cannot be muted as they are related to global settings instead of service-specific settings.

16. When you have finalized the service settings, click **Commit**.

⚠ Once the service is activated, you can monitor ingest, transcode, and output bitrates in the Monitor Channels app. Refer to [Monitoring a transport stream](#) for more information.

Related information

[IPTV and OTT service redundancy](#)

Configuring an ATS service

Adaptive Transport Stream (ATS) services create video transport streams that contain multiple bitrates and can be used with an external packager.

ATS services are part of a multiscreen service using adaptive bitrate. In VOS, available bitrates are based on the multiscreen service profile.

Configuring source input for an ATS service

When you add a new source, VOS discovers the properties of the source and returns detailed information about it. The source can then be used to configure a service.

i You can use a source in more than one service.

- [Supported input types](#)
- [Configuring source input](#)
- [Grooming the source input](#)

Configuring the ATS destination

Configure the ATS destination to use an ATS profile and multicast IP address.

Before you begin

[Configure the source input](#)

1. From the **Configure Channels** app, navigate to the **Destinations** page, click **+ Destination**.

The screenshot shows the 'Configure Channels' application interface. At the top, there are three tabs: 'Sources' (selected), 'Destinations', and 'Services'. To the right of the tabs is a 'Settings' gear icon. Below the tabs, there are two small icons: a video camera and a document. To the right of these icons is a search bar containing 'All destinations (11)'. Further to the right is a 'Destination' button with a '+' sign. The main area is titled 'Add destination'. It contains several input fields: 'DESTINATION NAME' (with placeholder 'e.g., LimeLight'), 'TYPE' (set to 'ATS'), 'PROFILE' (set to 'ATS Destination v.6'), and 'LABELS' (with a '+ Label' button). On the right side of the dialog, there is a 'OUTPUTS' section with a '+Output' button. At the bottom of the dialog are 'Cancel' and 'Create' buttons, with 'Create' being highlighted in blue.

2. For **Destination Name**, type the name of the ATS destination.
3. For **Type**, select **ATS**.
The default output type changes to CloudLink.
4. Verify that the selected **Profile** is an ATS profile.
5. Optionally, in the **Labels** field, enter a label associated with the destination, such as Cartoon or Premium.

Labels can help you search and find destinations more quickly.

6. If you wish to use an output that is different from the default, click **Remove output** and then click **+Output** and select the desired output type from the list.
ATS destinations use IP, CloudLink, and HSP outputs.
7. (Optional) In addition to the Primary destination output, you can create additional outputs for the same destination type (e.g. 2nd IP, 3rd IP and so on) by clicking **+Output**.



8. Configure the general settings for the Outputs section:

IP address	Enter the multicast IP address for the egress output streams.
Port	Enter the port number for the egress output streams. ⚠️ Port numbers will be incremented for each output video stream in the profile.
Source IP address	Enter the virtual source IP address for the egress output streams.
Port	Enter the virtual source UDP port for the egress output streams.
Rank	Used if multiple outputs are configured.
Status	Determine how outputs are paired for redundancy: <ul style="list-style-type: none"> • Mandatory output is active. • Standby output is muted. • Disabled output remains inactive until the status is changed to Standby or Mandatory using the VOS REST API or UI. The first Mandatory output will be paired with the first Standby output, and so on.
Output Monitor	If the service will be encrypted and you want to be able to monitor clean video output, select Output Monitor and provide the delivery IP address and Port for monitoring.

9. For ATS output with **CloudLink** destination, select the name of the downlink CloudLink.

10. For ATS output with **HSP** destination, no custom configuration is required.

11. Click **Create**.

Creating and activating an ATS service

Configure the profile, source, and destination that make up the service. Then, activate the service to begin receiving, transcoding, and outputting video.

Before you begin

[Configuring a source input](#)

[Configuring the ATS destination](#)

- From the **Configure Channels** app, navigate to the **Services** page, click **+ Service**.

Result: The **Create Service** wizard opens.



- On the **Profile** tab, select **Multiscreens Silver HD** and then click **Next**.
- On the **Source** tab, select the name of the primary source, and optionally, an alternate source / tertiary source, and then click **Next**.

⚠ The input streams of the paired CloudLink instances must be identical.

- On the **Destination** tab, select the name of the destination from the **Destination** drop-down list and then click **Next**.
- If necessary, on the **Commit** tab, for **Program Number**, type a program number for the video channel.
- In the **Service Name** field, enter the name of the new service.
- Optionally, select the **Priority** drop-down menu for the service. Options are **Low**, **Normal**, or **High**. The default setting is **Normal**.

⚠ You can use this Priority tag to quickly view the status and configuration of the high-priority services (and other priorities as well) in case any service is down and requires manual attention.

- Optionally, turn the **Redundancy** setting to **On** to activate service-level redundancy.

ⓘ In Redundancy Mode, VOS creates two services for the same channel (active-standby), using the same configuration. In the event that the active service fails, stream processing or packaging tasks failover to the standby service.

⚠ Transcode services must have an alternate input source configured, or the service must use a paired CloudLink.

- Optionally, turn the **Dynamic Program** setting to **On** to activate the dynamic program for the service.
- Optionally, turn the **Source Failover** to **On** to activate source redundancy for the service.
- Optionally, select the **Geo Redundancy** setting for the service. Options are **Auto**, **On**, or **Off**. The default setting is **Auto**.

⚠ If geo-redundancy is enabled on the VOS cluster, all services will be paired up between two VOS instances. This option allows pairing up partial services only instead of all services between two VOS instances for the geo-redundancy feature.

12. Select **Active** if you want the service to go online when you commit to the new service.
13. [Configure service add-ons](#) as required by the channel.
14. Optionally, turn the [Mute Notifications](#) setting to **On** to prevent the notifications from being noticed.

⚠ Geo-redundancy notifications cannot be muted as they are related to global settings instead of service-specific settings.

15. When you have finalized the service settings, click **Commit**.

⚠ Once the service is activated, you can monitor ingest, transcode, and output bitrates in the Monitor Channels app. Refer to [Monitoring a transport stream](#) for more information.

Related information

[IPTV and OTT service redundancy](#)

Configuring a multiscreen/origin service

Create multiscreen services for streaming video over IP networks to a variety of devices.

You can preview multiscreen services with DASH output in VOS using the Monitor Channels app. For multiscreen services with HLS or MSS output, you can obtain the output URL for copying to an external web-based player. For more information, refer to [Previewing and monitoring a multiscreen service](#).

Configuring source input for a multiscreen service

When you add a new source, VOS discovers the properties of the source and returns detailed information about it. The source can then be used to configure a service.

i You can use a source in more than one service.

- [Supported input types](#)
- [Configuring source input](#)
- [Grooming the source input](#)

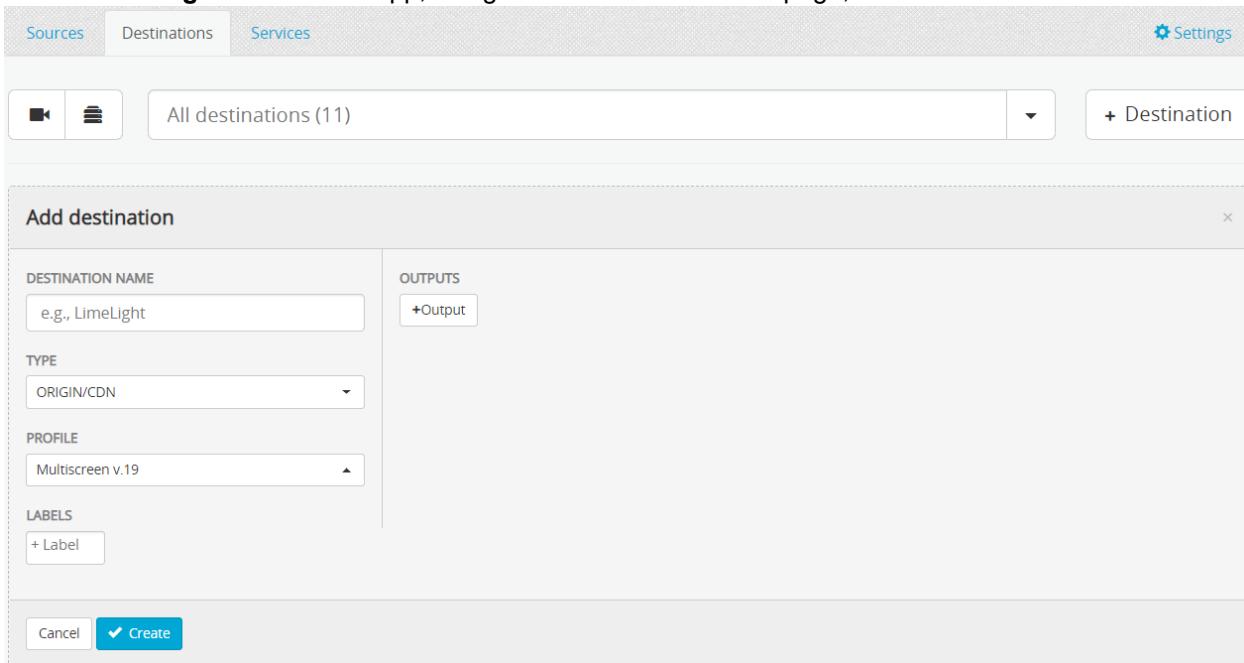
Configuring a multiscreen/origin service destination

Configure a destination for Origin Server/Content Delivery Network (CDN) services.

Before you begin

Configuring the source input

- From the **Configure Channels** app, navigate to the **Destinations** page, click **+ Destination**.



- For **Destination Name**, type the name of the new destination.
- For **Type**, select **Origin/CDN**.
- For **Profile**, select the desired **Origin** profile.
- If the destination profile used supports push packaging, then configure the following settings for each OTT package output (DASH, HLS, and/or MSS):

MPD Filename (DASH output only)	Enter the name of the MPD file of your output.
Playlist Filename (HLS output only)	Enter the name of the playlist file of your output.
Streaming Protocol	Select from HTTP or HTTPS.
Hostname	Enter an IP address or a hostname. Note that the DNS must be correctly configured.
Port	Set to 80 for HTTP. Can be customized if required.

Path	Full path of the publishing point on the configured hostname, including the specific sub-path for the service ("Service1", "CNN") <div style="border: 1px solid #ccc; padding: 5px; border-radius: 5px;"> i The resulting URL of the publishing point is "http://HOSTNAME:PORT/PATH" </div>
Username/Password	Use only if authentication is required.
Compatibility Mode	<p>Standard: WebDAV protocol (HTTP PUT/DELETE/MKCOL), in the case of HLS, DASH, and HSS formats. (With this compatibility mode, missing sub-folders are created using "MKCOL" HTTP request method and segment are removed after they have reached the retention period using "DELETE" HTTP request method).</p> <p>Akamai: HTTP POST in the case of HSS. WebDAV, with specific features, in the case of HLS and DASH.</p> <p>If you must publish to an Akamai CDN, then you must select Akamai for Compatibility Mode.</p> <p>Simple HTTP: Allows for only HTTP PUT requests to be sent. If enabled, VOS will not delete segment files after the Segment Retention Period configured in the destination profile is reached and VOS will not create the missing sub-folders.</p> <div style="border: 1px solid #FFB703; padding: 10px; border-radius: 10px; background-color: #FFF9C4;"> ⚠ To use Simple HTTP, the destination folder must exist on the remote server or the remote server must automatically create the missing folders based on the PUT request (as VOS will not make any WebDAV "MKCOL" request when using Simple HTTP publishing mode). Automatically creating missing folders is not the standard behavior for most of the web servers supporting HTTP PUT. When deactivating "Flattened Structure" (such as the use of a different subfolder for each video profile) or activating "Rollover Segment Dir," VOS automatically pushes to sub-folders and it is mandatory to use a server that can create those sub-folders automatically. </div>

6. If the destination profile used supports pull packaging, configure these optional settings under **Internal**:

Publish Name	<p>The publish name, if provided, is used in place of the service UUID in the egress URL. The publish name is case-sensitive and must adhere to the following guidelines:</p> <ul style="list-style-type: none"> • Can have 1-32 characters • Can contain a-z, A-Z, _ - : . <p>For example, the following egress URL uses a publish name (rio2016_1) instead of a service UUID (f13e52a6-45f4-c677-c5af-2fa05ac42fe5,startTime=14715212651600000): http://origin.example.com/content/HLS/Live/channel(rio2016_1)/index.m3u8</p>
Output Mode	<p>Live and Time-shift: Outputs live content and generates from-live data.</p> <p>Live Only: Outputs live content without generating from-live data.</p> <p>Time-shift Only: Generates from-live data only. Note that, in this mode, there is no URL for monitoring output.</p>

7. If the service will be encrypted and you want to be able to monitor clean video output, select **Output Monitor** and provide the delivery **IP address** and **Port** for monitoring.
8. Ensure that **Status** is set to **Mandatory**, as this is the only output defined for the service so it must be the active output.
9. Click **Create**.

Related information

[IPTV and OTT service redundancy](#)

[Creating an Origin/CDN destination profile](#)

Creating and activating a multiscreen service

Select the profile, source, and destination that make up the service, and then activate the service to begin receiving, transcoding, and outputting video.

Before you begin

[Configuring a source input](#)

[Configuring a multiscreen/origin service destination](#)

1. From the **Configure Channels** app, navigate to the **Services** page, click **+ Service**.
 Result: The **Create Service** wizard opens.



2. Select the required multiscreen profile and then click **Next**.

⚠ If the service utilizes an MBTS input source, you must select the **Multiscreens Passthrough** profile.

3. On the **Source** tab, select the name of the primary source, and optionally, an alternate source / tertiary source, and then click **Next**.

⚠ The input streams of the paired CloudLink instances must be identical.

4. On the **Destination** tab, select the name of the destination from the **Destination** drop-down list and then click **Next**.
5. If necessary, on the **Commit** tab, for **Program Number**, type a program number for the video channel.
6. In the **Service Name** field, enter the name of the new service.
7. Optionally, select the **Priority** drop-down menu for the service. Options are **Low**, **Normal**, or **High**. The default setting is Normal.

⚠ You can use this Priority tag to quickly view the status and configuration of the high-priority services (and other priorities as well) in case any service is down and requires manual attention.

8. Optionally, turn the **Redundancy** setting to **On** to activate service-level redundancy.

i In Redundancy Mode, VOS creates two services for the same channel (active-standby), using the same configuration. In the event that the active service fails, stream processing or packaging tasks failover to the standby service.

⚠ Transcode services must have an alternate input source configured, or the service must use a paired CloudLink.

9. Optionally, turn the **Dynamic Program** setting to **On** to activate the dynamic program for the service.
10. Optionally, turn the **Source Failover** setting to **On** to activate source redundancy for the service.
11. Optionally, select the **Geo Redundancy** setting for the service. Options are **Auto**, **On**, or **Off**. The default setting is Auto.

⚠ If geo-redundancy is enabled on the VOS cluster, all services will be paired up between two VOS instances. This option allows pairing up partial services only instead of all services between two VOS instances for the geo-redundancy feature.

12. Select **Active** if you want the service to go online when you commit to the new service.
13. [Configure service add-ons](#) as required by the channel.
14. Optionally, turn the **Mute Notifications** setting to **On** to prevent the notifications from being noticed.

⚠ Geo-redundancy notifications cannot be muted as they are related to global settings instead of service-specific settings.

15. When you have finalized the service settings, click **Commit**.

- ⚠** Once the service is activated, you can monitor ingest, transcode, and output bitrates in the Monitor Channels app. Refer to [Monitoring a transport stream](#) for more information.

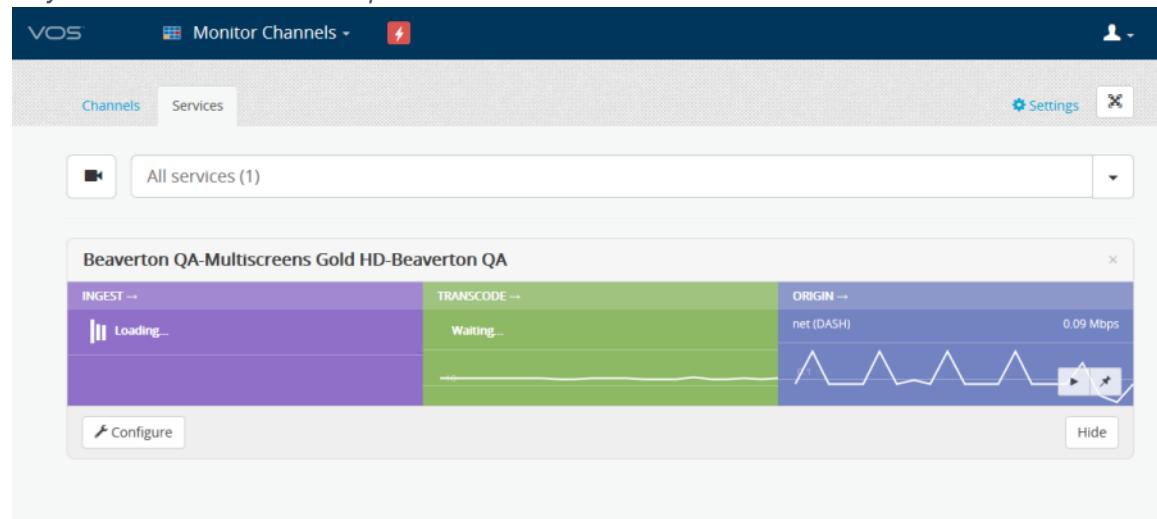
Related information

[IPTV and OTT service redundancy](#)

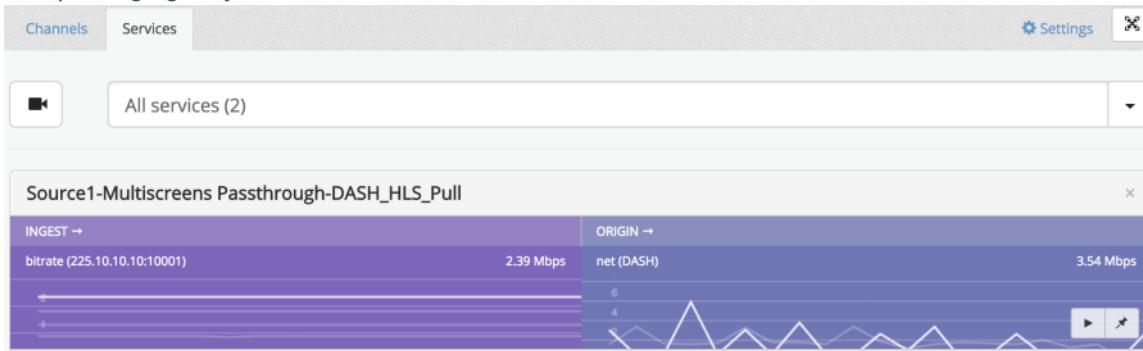
Previewing and monitoring a multiscreen service

You can use the embedded player in the Monitor Channels app to verify video output for services with DASH packaging. For services with HLS and MSS packaging, you must verify the video output externally.

1. From **Monitor Channels > Services**, verify that a small graph appears to the right of the service that you recently activated.
The small graph indicates that the service is active.
2. Click the active service to display the visualization graph.
The bitrate represented in the output graph depends on the type of service (linear or multiscreen).



Pull packaging-only service



⚠ Pure packaging services do not display a **Transcode** graph.

⚠ For pull-packaging services, the **Origin** graph shows the total output bitrate to players or CDN parent cache servers requesting the video. A bitrate of 0 Mbps indicates that no player is currently requesting the video.

⚠ For push-packaging services, a **Package** graph shows the total output bitrate to the publishing point.

- To preview a multiscreen service with DASH output, click the **Watch Output Video** icon on the graph, verify the video output, and then click **Close** to exit the video player.

❗ In browser live video monitoring and previewing is unavailable in Apple devices running iOS. Instead of displaying the video the player appears but displays with a black screen. To work around the issue, you should use a browser on a different device.

- To preview a multiscreen service with HLS or MSS output in an external player, do the following:

- Point to the **Copy Output URL** (push pin) icon and select the desired format.
- Open a Web browser, and then enter the URL for your web-based video player.

⚠ Ensure that the player you wish to use supports the transport protocol required by the packaging mode.

- Paste the output URL for the service into the video player and then click **Load** or **Play**.
- Verify the video output.

- Return to the Monitor Channels app, and then click **Hide** to close the visualization graph.

Configuring a packaging-only service

Packaging-only services are for ABR/MBTS streams that are transcoded by an upstream device, ingested by VOS, and delivered via push or pull packaging.

You can preview multiscreen services with DASH output in VOS using the Monitor Channels app. For multiscreen services with HLS or MSS output, you can obtain the output URL for copying to an external web-based player. For more information, refer to [Previewing and monitoring a multiscreen service](#).

Configuring source input for a packaging-only service

When you add a new source, VOS discovers the properties of the source and returns detailed information about it. The source can then be used to configure a service.

-  You can use a source in more than one service.

- [Supported input types](#)
- [Configuring source input](#)
- [Grooming the source input](#)

-  Packaging-only services use MBTS input sources.

Configuring a packaging-only service destination

Configure a destination for Origin Server/Content Delivery Network (CDN) services.

Before you begin

[Configure the source input](#)

-  Multiscreen service destinations support a single output.

- From the **Configure Channels** app, navigate to the **Destinations** page, click **+ Destination**.

The screenshot shows the 'Add destination' dialog box. It includes fields for Destination Name, Type, Profile, and Labels. An 'OUTPUTS' section with a '+Output' button is also present. At the bottom are 'Cancel' and 'Create' buttons.

- For **Destination Name**, type the name of the new destination.
- For **Type**, select **Origin/CDN**.
- For **Profile**, select the desired **Multiscreen** profile.
- If the destination profile used supports push packaging, then configure the following settings for each OTT package output (DASH, HLS, and/or MSS):

Streaming Protocol	Select from HTTP or HTTPS.
Hostname	Enter an IP address or a hostname. Note that the DNS must be correctly configured.
Port	Set to 80 for HTTP. Can be customized if required.
Path	Full path of the publishing point on the configured hostname, including the specific sub-path for the service ("Service1", "CNN").
<div style="border: 1px solid #ccc; padding: 5px; margin: 10px 0;"> i The resulting URL of the publishing point is "http:// HOSTNAME:PORT/PATH" </div>	
Username/Password	Use only if authentication is required.

<p>Compatibility Mode</p>	<p>Standard: WebDAV protocol (HTTP PUT/DELETE/MKCOL), in the case of HLS, DASH, and HSS formats. (With this compatibility mode, missing sub-folders are created using "MKCOL" HTTP request method and segment are removed after they have reached the retention period using "DELETE" HTTP request method).</p> <p>Akamai: HTTP POST in the case of HSS. WebDAV, with specific features, in the case of HLS and DASH.</p> <p>If you must publish to an Akamai CDN, then you must select Akamai for Compatibility Mode.</p> <p>Simple HTTP: Allows for only HTTP PUT requests to be sent. If enabled, VOS will not delete segment files after the Segment Retention Period configured in the destination profile is reached and VOS will not create the missing sub-folders.</p> <div style="border: 1px solid #f0e68c; padding: 10px; margin-top: 10px;"> <p>⚠ To use Simple HTTP, the destination folder must exist on the remote server or the remote server must automatically create the missing folders based on the PUT request (as VOS will not make any WebDAV "MKCOL" request when using Simple HTTP publishing mode). Automatically creating missing folders is not the standard behavior for most of the web servers supporting HTTP PUT. When deactivating "Flattened Structure" (such as the use of a different subfolder for each video profile) or activating "Rollover Segment Dir," VOS automatically pushes to sub-folders and it is mandatory to use a server that can create those sub-folders automatically.</p> </div>
----------------------------------	---

6. If the destination profile used supports pull packaging, configure these optional settings under **Internal**:

<p>Publish Name</p>	<p>The publish name, if provided, is used in place of the service UUID in the egress URL. The publish name is case-sensitive and must adhere to the following guidelines:</p> <ul style="list-style-type: none"> • Can have 1-32 characters • Can contain a-z, A-Z, _ - : <p>For example, the following egress URL uses a publish name (rio2016_1) instead of a service UUID (f13e52a6-45f4-c677-c5af-2fa05ac42fe5,startTime=14715212651600000): http://origin.example.com/content/HLS/Live/channel(rio2016_1)/index.m3u8</p>
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Output Mode	<p>Live and Time-shift: Outputs live content and generates from-live data.</p> <p>Live Only: Outputs live content without generating from-live data.</p> <p>Time-shift Only: Generates from-live data only. Note that, in this mode, there is no URL for monitoring output.</p>
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7. If the service will be encrypted and you want to be able to monitor clean video output, select **Output Monitor** and provide the delivery **IP address** and **Port** for monitoring.
8. Ensure that **Status** is set to **Mandatory**, as this is the only output defined for the service so it must be the active output.
9. Click **Create**.

Related information

[IPTV and OTT service redundancy](#)
[Creating an Origin/CDN destination profile](#)
[About Origin/CDN destinations](#)

Creating and activating a packaging-only service

Select the profile, source, and destination that make up the service, and then activate the service to begin receiving and delivering video.

Before you begin

[Configure the source input](#)

[Configuring a packaging-only service destination](#)

1. From the **Configure Channels** app, navigate to the **Services** page, click **+ Service**.

Result: The **Create Service** wizard opens.



2. On the **Profile** tab, select **Multiscreens Passthrough** and then click **Next**.
3. On the **Source** tab, select the name of the primary source, and optionally, an alternate source / tertiary source, and then click **Next**.

⚠ The input streams of the paired CloudLink instances must be identical.

4. On the **Destination** tab, select the name of the destination from the **Destination** drop-down list and then click **Next**.
5. If necessary, on the **Commit** tab, for **Program Number**, type a program number for the video channel.
6. In the **Service Name** field, enter the name of the new service.
7. Optionally, select the **Priority** drop-down menu for the service. Options are **Low**, **Normal**, or **High**. The default setting is **Normal**.

⚠ You can use this Priority tag to quickly view the status and configuration of the high-priority services (and other priorities as well) in case any service is down and requires manual attention.

8. Optionally, turn the **Redundancy** setting to **On** to activate service-level redundancy.

- i** In Redundancy Mode, VOS creates two services for the same channel (active-standby), using the same packaging configuration. In the event that the active service fails, packaging processes failover to the standby service.

- !** Transcode services must have an alternate input source configured, or the service must use a paired CloudLink.

9. Optionally, turn the **Dynamic Program** setting to **On** to activate the dynamic program for the service.

10. Optionally, turn the **Source Failover** to **On** to activate source redundancy for the service.

11. Optionally, select the **Geo Redundancy** setting for the service. Options are **Auto**, **On**, or **Off**. The default setting is **Auto**.

- !** If geo-redundancy is enabled on the VOS cluster, all services will be paired up between two VOS instances. This option allows pairing up partial services only instead of all services between two VOS instances for the geo-redundancy feature.

12. Select **Active** if you want the service to go online when you commit to the new service.

13. [Configure service add-ons](#) as required by the channel.

14. Optionally, turn the **Mute Notifications** setting to **On** to prevent the notifications from being noticed.

- !** Geo-redundancy notifications cannot be muted as they are related to global settings instead of service-specific settings.

15. When you have finalized the service settings, click **Commit**.

- !** Once the service is activated, you can monitor ingest, transcode, and output bitrates in the Monitor Channels app. Refer to [Monitoring a transport stream](#) for more information.

Configuring a mux service

Configuring source input for a mux service

When you add a new source, VOS discovers the properties of the source and returns detailed information about it. The source can then be used to configure a service.

- i** You can use a source in more than one service.

- Supported input types
- Configuring source input
- Grooming the source input

Configuring service output in the Configure Broadcast app

Use the Configure Broadcast app to configure output programs/components for the mux service.

1. Click the **Configure Broadcast** app from the **Apps** page.

The screenshot shows the 'Configure Broadcast' application interface. At the top, there is a navigation bar with tabs for 'Configuration', 'Programs', and 'Statistics'. On the right side of the header, there are links for 'Settings', a user profile icon, and a 'Staging' button. Below the header, a main content area displays a list of multiplexers. A single item is listed under the heading 'All multiplexers (1)'. The item is named 'PoolSource-StatMux_Dhe-DVB MPTS SD Max 18TxSource[HRNQA]-MPTS (6 prog.)'. To the right of this item, there are four small buttons labeled 'Edit', 'Programs', 'Statistics', and 'Multiplexer'. The background of the application is white, and the overall design is clean and modern.

2. Select the mux service that you have created from the **Services** page and click the **Multiplexer** button.

Result: The **Logical Inputs** (for monitoring) and **Logical Outputs** (for configurations) sections are displayed.

Note

When using Statmux for mux service managing a video pool, any transcoded services in the pool are automatically present in the Logical Inputs and Logical Outputs section. The mux service is copied from the Logical Inputs to Logical Outputs automatically.

For the pass-through service, you do not need to change the output program/component configurations.

3. From the Destination Name in the **Logical Outputs** section:

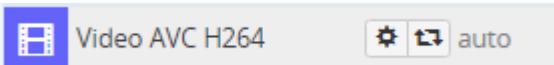
- Click to configure the **TS ID** and **Original Network ID** as global output settings.
- Click to edit **TS ID** as global output settings.

4. From the Program in the **Logical Outputs** section:

- Click to edit the output program.

- **Program name**
 - **Program number**
 - **PMT PID**
 - **Provider**
 - **Output Type**
 - **Enable Scrambling**
- Click  to add the output PMT descriptors (simple HEX buffer).
- Click  to enable the EAS parameters.

5. From the component (e.g. Video, Audio, Private PES, SCTE35) in the **Logical Outputs** section:



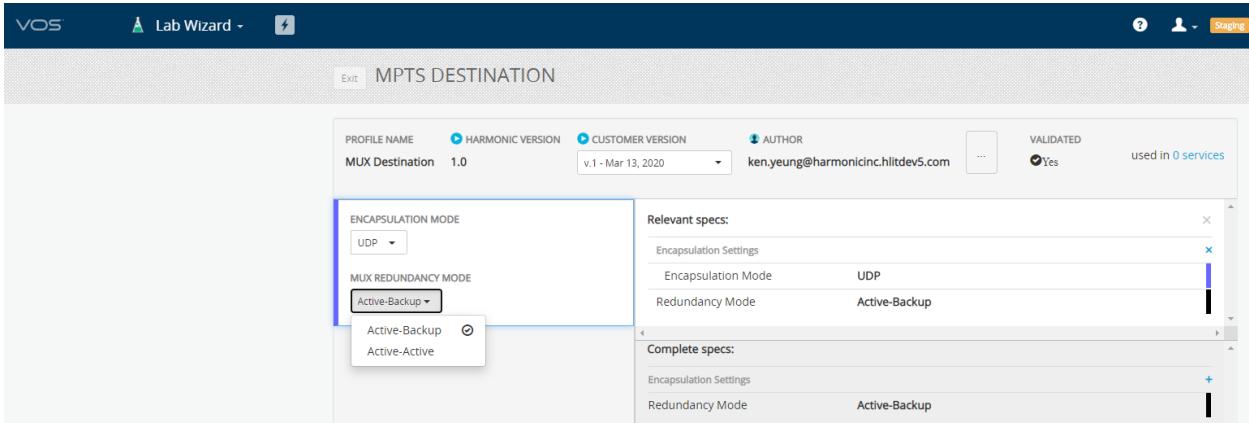
- Click  to edit the output components.
- **Output PID**
 - **ES Type**
 - **CMP Tag**
 - **SCG**
- Click  to add the output PMT descriptors (simple HEX buffer).
- Click  to edit the output component PID.

6. Click **Save**.

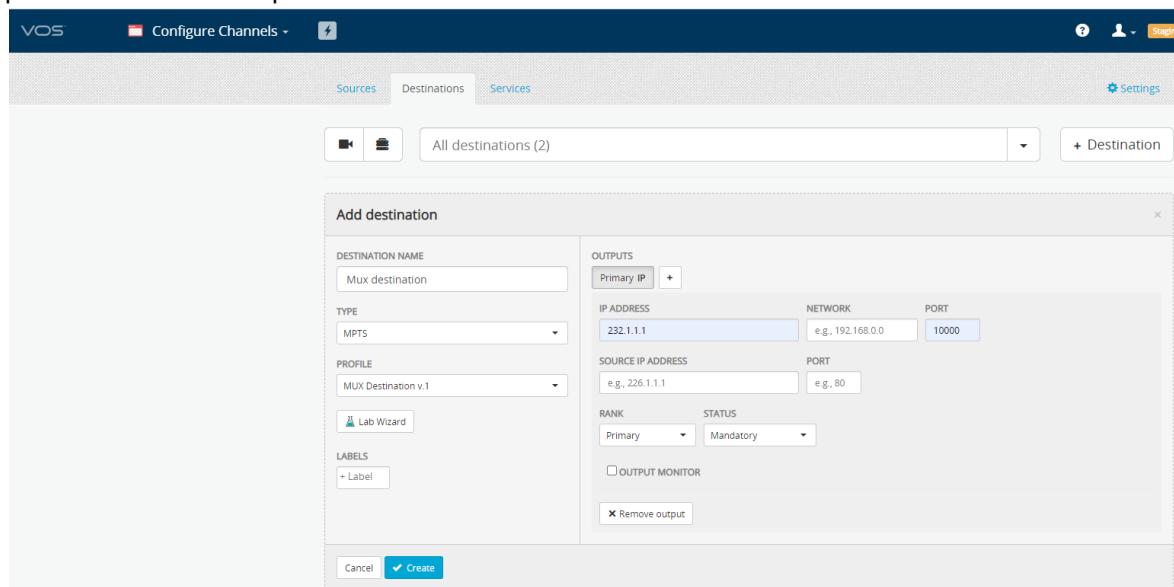
Creating 1+1 output redundancy for a mux service

You can set up 1+1 redundancy for the mux service output using the VOS UI.

1. Navigate to the **Lab Wizard** app, create a Mux Destination profile with desired Mux Redundancy Mode configured. ([Refer to Modifying a profile for details](#))
Configure the **Mux Redundancy Mode**:
 - **Active-Active**: If selected, both Mux instances will output at the same time. Each of the Mux instance will output to a different address.
 - **Active-Backup**: If selected, only one Mux instance will output and the other will be muted. Both Mux instances will output to the same address.



2. Navigate to **Configure Channels > Sources**, configure the source input for the mux service.
3. Navigate to **Configure Channels > Destinations**, configure the mux destination.
 - Setting "Active-Backup" redundancy for mux service: Configure the **Type** as MPTS and the **Profile** as the Mux Destination" profile with "Active-Backup" enabled. Configure the output stream IP parameters in the "Outputs" section.



- Setting "Active-Active" redundancy for mux service: Configure the **Type** as MPTS and the **Profile** as the Mux Destination" profile with "Active-Active" enabled. The "Dual Service Output" section appears for setting the second output stream IP parameters.

The screenshot shows the 'Edit destination' dialog for 'MuxMPTS'. The 'DESTINATION NAME' field contains 'MuxMPTSSoutux'. The 'TYPE' field is set to 'MPTS'. The 'PROFILE' field is set to 'MUX Destination UDP ACTIV'. The 'LABELS' section has a '+ Label' button. The 'Used in 1 services.' message is displayed. The 'OUTPUTS' section shows two entries:

IP ADDRESS	NETWORK	PORT
239.191.105.1	10.191.0.0	5000

The 'DUAL SERVICE OUTPUT' section shows one entry:

IP ADDRESS	NETWORK	PORT
239.191.105.1	10.191.0.0	5002

Buttons at the bottom include 'Delete', 'Save', 'Revert', and 'Close'.

4. Navigate to **Configure Channels > Services**, create and activate the mux service.

- Set the **Redundancy** mode to "On".

The 'Create Service' dialog shows the following configuration:

- Service name:** PoolSource-divittrack pool-MPTS-Mux destination
- Profile:** MPTS
- Source(s):** PoolSource-divittrack pool
- Destination(s):** Mux destination
- Redundancy:** ON (checkbox checked)
- Status:** Active (checkbox unchecked)

How to create 1+1 output redundancy for a mux service with the REST API

You can set up 1+1 redundancy for the mux service output using the REST API.

Setting the redundancy mode in the LabWizard MPTS destination profile

1. Navigate to the **Developer API** app.
2. Under **LabWizard**, click **GET/labwizard/v1/profiles/{id}** with your "MUX Destination Active-Active Redundancy" profile id.
3. In "mptsDestinationProfileProperties" object, the "serviceRedundancyMode" enum, takes: [e_ACTIVE_BACKUP, e_ACTIVE_ACTIVE]

e.g. Below at line 31, configure "serviceRedundancyMode": "e_ACTIVE_ACTIVE" will set the redundancy mode to ACTIVE-ACTIVE.

MPTS Destination Profile

```

1   {
2     "version": "",
3     "creationTime": "2020-05-27T16:37:01.000Z",
4     "lastUpdatedTime": "2020-05-27T16:37:01.000Z",
5     "id": "7196f546-f107-4c9e-aae8-8951f0508e25",
6     "labels": [
7       "MUX Destination",
8       "Active-Active Redundancy"
9     ],
10    "name": "MUX Destination Active-Active Redundancy",
11    "type": "e_MPTS_DESTINATION",
12    "minRequiredVosBundleVersion": "",
13    "harmonicVersion": "1.0",
14    "customerVersion": "1",
15    "validateTime": "",
16    "validated": true,
17    "masterId": "c190b729-47c1-4243-a1c8-fc446288c5f4",
18    "isTemplate": false,
19    "isReadonly": null,
20    "isCustomized": false,
21    "stbProfileProperties": null,
22    "ottStbProfileProperties": null,
23    "iptvProfileProperties": null,
24    "multiscreenProfileProperties": null,
25    "mptsProfileProperties": null,
26    "broadcastCBRProfileProperties": null,
27    "destinationProfileProperties": null,
28    "iptvDestinationProfileProperties": null,
29    "atsDestinationProfileProperties": null,
```

```

30     "mptsDestinationProfileProperties": {
31         "serviceRedundancyMode": "e_ACTIVE_ACTIVE",
32         "encapsulationSettings": {
33             "encapsulationMode": "e_UDP"
34         }
35     },
36     "fileTranscodingProfileProperties": null,
37     "manipulationProfileProperties": null,
38     "drmTrackFilterProfileProperties": null,
39     "pureOttPlayoutProfileProperties": null,
40     "pureOttPlayoutDestinationProfileProperties": null,
41     "information": null,
42     "processingRequirementProperties": null,
43     "hlsGroupingProfileProperties": null,
44     "mmsTranscodeRequirements": null
45 }
```

Setting the MPTS Mux service destination parameters

1. Navigate to the **Developer API** app.
2. Click **GET/configure/v1/destinations/{id}** with your destination Id.
3. Set the profileId to the MPTS Mux profile that you desire to use.
e.g. Below at line 42, "destinationProfileId": "7196f546-f107-4c9e-aae8-8951f0508e25" that points to the labwizard profile id above at line 5.

Mux Destination

```

1  {
2      "id": "d9059542-ed0a-4b04-8ff1-a7faf7a679e2",
3      "type": "MPTS",
4      "labels": [],
5      "name": "MuxMPTSout",
6      "outputs": [
7          {
8              "id": "64e912d8-40bd-4c5e-9ab3-823fc2d52baf",
9              "redundancyMode": "MANDATORY",
10             "rank": 1,
11             "outputType": "IP",
12             "ipSettings": {
13                 "labels": [],
14                 "ipNetworkAddress": "172.30.0.2",
15                 "ipAddress": "230.1.1.1",
16                 "ipPort": 5000,
17                 "cloudlinkGroupId": null,
18                 "cloudlinkId": null,
19                 "outputMonitor": false,
20                 "ipAddressForMonitoring": null,
21                 "ipPortForMonitoring": 0,
```

```

22     "virtualSourceIp": "",
23     "virtualSourcePort": 0,
24     "profileIpNetworkAddress": null,
25     "profileIpAddress": [],
26     "profileIpPort": [],
27     "profileVirtualSourceIp": null,
28     "profileVirtualSourcePort": null,
29     "multicastTTL": 0,
30     "doNotFragment": false,
31     "zixiOutputSettings": null,
32     "srtOutputSettings": null,
33     "poolBinding": null,
34     "dualServiceOutput": null
35   },
36   "sdiSettings": null,
37   "originSettings": null,
38   "hspSettings": null,
39   "psiSiTableSpoolingConfig": null
40 }
41 ],
42 "destinationProfileId": "7196f546-f107-4c9e-aae8-8951f0508e25",
43 "embeddedDestinationProfile": null,
44 "embeddedManipulationProfiles": null,
45 "poolAddon": null,
46 "inUse": true
47 }
```

You may change and update with the new parameters in **PUT/configure/v1/destinations/{id}**.

Enabling redundancy at the configure/v1/services API

1. Navigate to the **Developer API** app.
2. Click **GET/configure/v1/services/{id}** with your Mux Service Id.
e.g. Below at line 22, setting the attribute "redundancyMode": "ON" will turn on the redundancy mode.

configure Service

```

1  {
2    "id": "64f1944e-5eaf-466c-ae96-5ef99ada95f9",
3    "name": "PoolSource-Poule-MPTS-MuxMPTSout",
4    "labels": [],
5    "orchestrationLabels": [],
6    "programNum": 0,
7    "serviceSources": [
8      {
9        "sourceId": "0b5ed4af-9cc0-490b-9b5e-318a53db9eb2",
10       "rank": 0
11     }
12   ],
13   "subServices": null,
```

```
14 "profileId": "241c96f0-b3b5-4d8c-9a08-82e7181e72b3",
15 "embeddedProfiles": null,
16 "destinationId": "d9059542-ed0a-4b04-8ff1-a7faf7a679e2",
17 "destinationsId": [
18     "d9059542-ed0a-4b04-8ff1-a7faf7a679e2"
19 ],
20 "timeShiftWindow": null,
21 "addons": null,
22 "controlState": "OFF",
23 "redundancyMode": "ON",
24 "rank": 3,
25 "processingEngineVersion": null,
26 "processingEngine": null,
27 "processingDockerImage": null,
28 "enableRollingUpgrade": false,
29 "hostLabel": null,
30 "serviceTrackingMode": null,
31 "dynamicProgramMode": null,
32 "sourceFailoverConditions": null,
33 "version": null
34 }
```

Enabling EAS SCTE-18 on mux services

- Configuring EAS grouping for monthly testing
- Configuring EAS sources on the mux service
- Configuring EAS parameters on output program level

Configuring EAS grouping for monthly testing

You can configure the Active Group ID which needs to match with the Group ID of the output program in order to have the SCTE-18 "test message" forwarded for monthly testing if using the Emergency Alert System.

- From the **Configure Broadcast** app, click the **Settings** at the top right corner of the page.

EAS - Customize global settings for the EAS

EAS MODE: None

SCTE-18 SOURCE: Loading ...

ALERT PRIORITY THRESHOLD: 1

PROCESS TEST MESSAGES: OFF

ACTIVE GROUP FOR TEST MESSAGES: All

Revert **Save**

- Configure the following settings on the **EAS Setting** tab:

- EAS Mode:** Select the SCTE-18 for the EAS mode.
- SCTE-18 Source:** Choose the incoming source for the SCTE-18 message.

ⓘ Info

The input source with the Signal Loss slate configured via the Configure Channels app cannot be used for this SCTE-18 test message, otherwise errors will be triggered.

If your selected "**SCTE-18 Source**" is enabled with slate insertion, VOS will disable/ignore slate insertion for the SCTE-18 source to avoid any possible configuration errors.

- Alert Priority Threshold:** Set the Priority Threshold.
- Process Test Messages:** Set the toggle to enable the test messages processing.
- Active Group for Test Message:** Select the Active Group ID that is used for the test message. For example, select a group of Muxes 1-10 in order to perform monthly testing for Emergency Alert System. Each time is performed for 10% of the Muxes.

⚠ Note

When the Active Group ID is configured and the Group ID of the output program is configured but the two IDs do not match, the SCTE-18 "test message" will be ignored.

- Click **Save**.

Configuring EAS sources on the mux service

All the sources from which the EAS channels come from need to be linked to the mux service created.

1. Navigate to **Configure Channels** app.
2. Click the **Services** tabs and edit the mux service that you have created.
3. Select the **Source(s)** for the incoming EAS channels.

Info

The input source cannot have the Signal Loss slate contained for the EAS channels, otherwise errors will be triggered.

You should disable slate insertion from the input source via the Configure Channels app if the source will be used as the EAS SCTE-18 service. Otherwise, VOS will disable/ignore slate insertion for the SCTE-18 source to avoid any possible configuration errors.

4. Click **Save**.

Configuring EAS parameters on output program level

Use the Configure Broadcast app to configure parameters on each output program where an EAS emergency is possible.

1. Click the **Configure Broadcast** app from the **Apps** page.
2. Click on **Mux Service** to select the service with EAS enabled you have created from the **Services** page. (Refer to [Configuring service output in the Configure Broadcast app](#) for details.)

3. From the **Logical Outputs** section, Click to edit the output program.

- Click on the **EAS** tab to configure the Group ID for Test Messages and desired configurations.

0x0 Program "J2" X

Program	Descriptors	EAS
ENABLE	<input type="button" value="ON"/>	
GROUP FOR TEST MESSAGES	<input type="button" value="1 ▾"/>	
ALTERNATIVE SOURCE	EAS_CH1_Sails ▾	PROGRAM
STATE	COUNTY	
All (00) -	All (00) -	+
<input type="button" value="Save"/> <input type="button" value="Cancel"/>		

- Click **Save**.

Configuring Nielsen setting for a mux service

You can customize the Nielsen setting for audio watermarking on mux services.

- From the **Configure Broadcast** app, click the **Settings** at the top right corner of the page and

Configuration Programs Statistics Settings

EAS setting Nielsen setting

NIELSEN - Customize Nielsen setting for the audio watermarking

SENDER TIME ZONE UTC (GMT+00:00) ▾

- Navigate to the **Nielsen Setting** tab.
- For Nielsen audio watermarking, the **Sender Time Zone** setting is used to calculate automatically the daylight saving time according to the time zone of the sender.

4. Click **Save**.

Configuring the mux destination

Configure a destination for mux services with the destination type configured as MPTS.

Before you begin

Configuring the source input

1. From the **Configure Channels** app, navigate to the **Destinations** page, click **+ Destination**.

The screenshot shows the 'Add destination' dialog box. It has fields for DESTINATION NAME (e.g., LimeLight), TYPE (MPTS), PROFILE (MUX Destination v.1), and LABELS (+ Label). There is also an OUTPUTS section with a '+Output' button. At the bottom are 'Cancel' and '✓ Create' buttons.

2. For **Destination Name**, type the name of the Mux destination.
3. For **Type**, select **MPTS**.
The default output type **IP** is selected under **Outputs**.
4. Verify that the selected **Profile** is a Mux profile.
5. Optionally, in the **Labels** field, enter a label associated with the destination, such as Cartoon or Premium.

Labels can help you search and find destinations more quickly.

6. If you wish to use an output that is different from the default, click **Remove output** and then click **+Output** and select the desired output type from the list.
Mux destinations use IP, Cloudlink, SRT, Cloud, and Relay (HSP) outputs.
7. Enter the multicast IP address and port number for the egress output streams.
8. For mux output with **CloudLink** destination, enter the name of the downlink CloudLink.
9. For mux output with **SRT** destination, use the default SRT settings or configure the custom SRT settings:

Encryption Type	Choose an encryption standard, or select None .
-----------------	--

Channel Name	Enter a channel name that will also be used in the receiver configuration.
Bandwidth Overhead (%)	The Bandwidth Overhead is the percentage of the Average Bandwidth used to accommodate SRT controls. The default value is 20%.
Latency (ms)	Sending packets over a (usually unpredictable) network could result in time delay. SRT Latency is a fixed value (min. 0 ms, no max. value) representing the maximum buffer size available for managing SRT packets. The default value is 1000 ms.
Timeout (ms)	Connection timeout, in milliseconds. The default value is 10000 ms.
Blocking Mode	When blocking mode is enabled, the SRT function will not exit until the availability condition is satisfied. In non-blocking mode the SRT function always exits immediately, and in case of lack of resource availability, it returns an error with appropriate code.

10. For mux output with **Cloud (Live Routing)** destination, the Cloud channel will be available as a source to be up-linked to the Harmonic's Cloud via Live Routing Service. This configuration is applicable to **VOS360** and need to have access to the Syndicate app only.
11. For mux output with **Relay (HSP)** destination, no custom configurations are required.
12. If the service will be encrypted and you want to be able to monitor clean video output, select **Output Monitor** and provide the delivery **IP address** and **Port** for monitoring.
13. Click **Create**.

⚠ For creating a statmux pool, refer to How to create a DiviTrack/Statmux pool for the configuration details.

Creating and activating a mux service

Select the MPTS profile, source, and destination to be used for the mux service and configure any service add-ons. Activate the service when it is ready for multiplexing.

Before you begin

[Configuring a source](#)

[Configuring the mux destination](#)

Mux services typically use a MPTS profile with a mux destination.

- From the **Configure Channels** app, navigate to the **Services** page, click **+ Service**.

Result: The **Create Service** wizard opens.



- On the **Profile** tab, select the MPTS profile from **TS Multiplexer** the service will use, and then click **Next**.

⚠ If you have not created a DiviTrack Pool, you may need to create a DiviTrack Pool first. (Refer to How to create a DiviTrack/Statmux pool for IPTV/Broadcast destination for details)

- On the **Source** tab, select the name of the primary source, and optionally, an alternate source / tertiary source, and then click **Next**.

⚠ The input streams of the paired CloudLink instances must be identical.

- On the **Destination** tab, select the name of the destination from the **Destination** drop-down list and then click **Next**.
- On the **Commit** tab, enter the name of the new service in the **Service Name** field.
- Optionally, select the **Priority** drop-down menu for the service. Options are **Low**, **Normal**, or **High**. The default setting is Normal.

⚠ You can use this Priority tag to quickly view the status and configuration of the high-priority services (and other priorities as well) in case any service is down and requires manual attention.

- Optionally, turn the **Redundancy** setting to **On** to activate service-level redundancy.

i In Redundancy Mode, VOS creates two services for the same channel (active-standby), using the same configuration. In the event that the active service fails, stream processing or packaging tasks fail over to the standby service.

- Select **Active** if you want the service to go online when you commit the new service.
- Configure service add-ons as required by the channel.
- Optionally, turn the **Mute Notifications** setting to **On** to prevent the notifications from being noticed.

⚠ Geo-redundancy notifications cannot be muted as they are related to global setting instead of service-specific setting.

- When you have finalized the service settings, click **Commit**.

⚠ Once the service is activated, you can monitor ingest, transcode, and output bitrates in the Monitor Channels app. Refer to [Monitoring a transport stream](#) for more information.

Configuring Availability Zone (AZ) support for transcode and mux 1:1 redundancy

Availability Zones (AZ) are usually physically isolated sets of resources. A kubernetes cluster can be deployed across multiple AZ to achieve a high level of resilience against hardware failure or planned maintenance event. In VOS, 1+1 service redundancy already supports running on different nodes.

1. Deploy the cluster. For VOS Cloud-Native Software deployed on-prem, use kubectl to properly set the `topology.kubernetes.io/zone` label to the nodes.

Use kubectl to set node label

```
# Add label
kubectl label node <nodeName> topology.kubernetes.io/zone=westus2-1

# Remove label (if needed)
# NOTE syntax: kubectl label node <nodename> <labelname>-
kubectl label node <nodeName> topology.kubernetes.io/zone-
```

2. Once deployed, check to make sure that the nodes have proper `topology.kubernetes.io/zone` labels.

Use kubectl to check node labels

```
$ kubectl get node <node-name> -o json | jq '.metadata.labels'
{
    "agentpool": "generic",
    "beta.kubernetes.io/arch": "amd64",
    "beta.kubernetes.io/instance-type": "Standard_F16s_v2",
    "beta.kubernetes.io/os": "linux",
    "failure-domain.beta.kubernetes.io/region": "westus2",
    "failure-domain.beta.kubernetes.io/zone": "westus2-1",
    "kubernetes.azure.com/cluster": "saas-vos360-dev-genx-genx-01-node",
    "kubernetes.azure.com/mode": "system",
    "kubernetes.azure.com/node-image-version":
"AKSUbuntu-1804containerd-2021.01.06",
    "kubernetes.azure.com/role": "agent",
    "kubernetes.io/arch": "amd64",
    "kubernetes.io/hostname": "aks-generic-20974417-vmss000000",
    "kubernetes.io/os": "linux",
    "kubernetes.io/role": "agent",
    "node-role.kubernetes.io/agent": "",
    "node-role.vos/controller": "true",
    "node-role.vos/egress": "true",
    "node-role.vos/live_ingest": "true",
    "node.kubernetes.io/instance-type": "Standard_F16s_v2",
    "topology.kubernetes.io/region": "westus2",
    "topology.kubernetes.io/zone": "westus2-1"
}

# Or get all labels from all nodes
```

```
$ kubectl get node -o json | jq '.items[].metadata.labels'
```

3. Create the Transcoding and Mux services with service redundancy.

⚠ Transcoding service and Mux service are two different types of service. They do not run in the same single service. Therefore, transcoding or mux services run individually. The configuration for service redundancy of transcoding service or mux service are identical.

4. Before starting the service, enable the **Redundancy** toggle to trigger service redundancy.

The screenshot shows a software interface for creating a service. At the top, there is a navigation bar with tabs: EXIT, 1 Profile, 2 Source, 3 Destination, and 4 Commit. The 'Commit' tab is highlighted. Below the navigation bar, the text "Review and commit." is displayed. The main area contains the following configuration fields:

Service name	Harmonic HVN 2 Sample-Source-Multiscreens Bronze SD-hj	Harmonic HVN 2 Sample-Source
Program Number	1	
Profile	Multiscreens Bronze SD	
Source(s)	Harmonic HVN 2 Sample-Source	
Destination(s)	hj	
Redundancy	ON	OFF
Dynamic program	OFF	
Status	<input type="checkbox"/> Active	

Below the configuration fields, there is a section labeled "Add-ons" with a checkbox. At the bottom of the screen, there are two buttons: "Back" and "Commit".

5. For a mux service, use the DiviTrack Pool as a source and MPTS destination. Enable the **Redundancy** toggle for this Service Redundancy feature.

The screenshot shows the 'Services' tab selected in the top navigation bar. The main area displays the configuration for a service named 'ipSrc1-DVB MPTS-desst'. The configuration fields include:

- SERVICE NAME:** ipSrc1-DVB MPTS-desst
- RANK:** 1
- REUNDANCY:** ON
- SOURCE(S):** PoolSource-diviMux
- PROFILE:** DVB MPTS v.3
- DESTINATION:** desst (MPTS (IP) desst 226.1.1.1)

Below the configuration panel, there are two service status cards:

- ipSrc1-IPTV SD 25-ipdst1 (Activated)
- ipSrc2-IPTV SD 25-ipdst2 (Activated)

Result: After the service is activated, it is deployed on nodes in different zones.

Configuring and operating a playout service

Operators can use the VOS Playout Monitor app to monitor playout channels and perform master control operations. It supports the automatic execution of a playlist derived from a traffic schedule, as well as automatic fetch from the source file.

- **Primary events** consist of video events or clips. Both file-based assets and live input sources can be used for primary events. Live inputs and MXF assets support multiple languages, with multiple language playback in the output stream.
- **Secondary events** refer to graphics events, including logos and animations, and are always associated with a primary event. They are always executed with timing that is relative to the primary event.

You may use S3 bucket source or Blob storage source. For instructions on configuring an S3 bucket source, refer to [Using the S3 Bucket source](#). For instructions on configuring a Blob Storage source, refer to [Using the Azure Blob Storage](#).

Logos and graphic templates may be manually uploaded using the **Web Uploader** in Asset Acquisition. File-based video assets may also be uploaded manually in Asset Acquisition, but this is not recommended for production environments.

Info

You must configure at least one playout service in the **Configure Channels** app before you can access the Playout Monitor app.

The following topics are included in this section:

- [Configuring a playout service](#)
- [Configuring an external live feed](#)
- [VOS Playout Monitor app overview](#)
- [Triggering SCTE-35 dynamic ad insertion](#)
- [VOS playlist schema](#)
- [Loading a playlist](#)
- [Creating a primary event](#)
- [Creating a secondary event](#)
- [About Override mode](#)
- [Supported alarms](#)
- [About as-run logs](#)

Configuring a playout service

The playout service consists of an internally generated playout source, the service destination, and a transcoding or pass-through profile.

Follow these steps to configure a playout service:

1. [Configuring a playout source](#)
2. [Configuring a playout destination](#)
3. [Creating and activating a playout service](#)
4. Optionally, configure external live feeds for primary events. Refer to [Configuring an external live feed](#) for more information.

Once the playout service is activated, you can monitor the timeline and perform master control operations using the Playout Monitor app. You can preview multiscreen services with DASH output in VOS using the Monitor Channels app. For multiscreen services with HLS or MSS output, you can obtain the output URL for copying to an external web-based player.

Configuring a playout source

The source defines the frame rate, resolution, and languages for the playout channel. One source can be used in multiple services, each with a unique destination.

The playout source supports the following resolutions:

- 576i @ 25fps
- 480i @ 29.97fps
- 720p @ 50/59.94 fps
- 1080i @ 25/29.97 fps
- 1080p @ 50/59.94 fps

i Info

When the encoding profile is multiscreen, an interlaced Playout source is automatically converted to progressive.

1. From the **Configure Channels** app, navigate to the **Sources** page. Click **+ Source**.
2. In the **Input Source Name** field, enter the name of the new source.
3. If you wish to be able to filter by user-defined labels, enter a label in the **Labels** field.
4. Below **Inputs**, configure the **Signal Loss** input with the desired image file, or click **Remove** to delete the input if it is not required.
5. Click the **Add Input** icon, and then select **Playout Source** from the drop-down list.
6. Optionally, specify a **Playlist offset** between -2 and 0 seconds.

⚠ Note

If set to -2 seconds, an event that is scheduled at T0 will start at T0 -2 seconds.

7. For **Video Grooming**, define the frame rate and resolution for the playout source.
8. For **Audio Streams**, specify each language to be used in the playout source.

i Info

Multiple audio streams are supported in external live inputs and MXF assets with PCM audio only. The languages used by the assets must match the languages defined for the playout source.

i Info

A language must not be specified more than once.

9. Optionally, choose an option in the **Data Streams** drop-down list. Options include the following:
 - SCTE-35
 - SCTE-27
 - DVB subtitling
 - Teletext
 - ID3
 - Unknown
10. Optionally, specify the **Duck Level** and the **Voice Over Level** in the **Voice over** area.
11. Set the time zone for your source from the **Time Zone** drop-down list.

⚠ Note

For drop-frame sources (29.97, 59.94 fps), configure the **UTC Time of Daily Adjustment** (or the hour at which the adjustment is done, 0-23).

12. Optionally, choose an option from the **Max Asset Bitrate** drop-down list.
13. Optionally, choose an option from the **Default Live Input** drop-down list.
14. Click **Create**.

Configuring a playout destination

The playout service can have an IP, downlink CloudLink, or CDN destination.

Before you begin

Configuring a playout source

1. From the **Configure Channels** app, navigate to the **Destination** page. Click **+ Destination**.
2. In the **Destination Name** field, enter the name of the new destination.
3. Select the destination **Type** and **Profile**.
4. If you wish to be able to filter by user-defined labels, enter a label in the **Labels** field.
5. Configure a signal loss output by selecting an image from a file server, or remove the output by clicking **Remove Output**.
6. Click **+Output** and select the output type from the list.
Note that Origin/CDN destinations have a single output option.
7. Configure the settings for the type of output you are using.

- For IP and CloudLink outputs, configure the following settings:

IP address	Type the multicast IP address for the egress output streams.
Port	Type the port number for the egress output streams.
Rank	Used if multiple outputs are configured.
Status	<p>Determine how outputs are paired for redundancy:</p> <ul style="list-style-type: none"> • Mandatory output is active. • Standby output is muted. • Disabled output remains inactive until the status is changed to Standby or Mandatory using the VOS REST API or UI. <p>The first Mandatory output will be paired with the first Standby output, and so on.</p>
CloudLink	If the output type is CloudLink, select the name of the downlink CloudLink.

Output Monitor	If the service will be encrypted and you want to be able to monitor clean video output, select Output Monitor and provide the delivery IP address and Port for monitoring.
• For Zixi outputs, configure the following settings:	
IP Address	Type the IP address for the egress output streams.
Port	Type the port number for the egress output streams.
Rank	Used if multiple outputs are configured.
Status	Determine how outputs are paired for redundancy: <ul style="list-style-type: none"> • Mandatory output is active. • Standby output is muted. • Disabled output remains inactive until the status is changed to Standby or Mandatory using the VOS REST API or UI. The first Mandatory output will be paired with the first Standby output, and so on.
Output Monitor	If the service will be encrypted and you want to be able to monitor clean video output, select Output Monitor and provide the delivery IP address and Port for monitoring.
Encryption Type	Choose an encryption standard, or select None .
Channel Name	Enter a channel name that will also be used in the receiver configuration.
FEC Overhead (%)	FEC overhead in % over the source bitrate. The default value is 20%.
FEC Block (ms)	Maximum time of the FEC block, in milliseconds. The default value is 10 ms.

Max Latency (ms)	Maximum latency for error correction, in milliseconds. The default value is 1501 ms.
Timeout (ms)	Connection timeout, in milliseconds. The default value is 10000 ms.

- For Origin/CDN outputs, configure the following settings for each OTT package output (DASH, HLS, and/or MSS):

Rank	Used if multiple outputs are configured.
Streaming Protocol	Choose from HTTP and HTTPS.
Hostname	Enter an IP address or a hostname.
Port	Set to 80 for HTTP. Can be customized if required.
Path	Full path of the publishing point on the configured hostname, including the specific sub-path for the service ("Service1", "CNN").
<p>⚠ Note</p> <p>The resulting URL of the publishing point is "http://HOSTNAME:PORT/PATH".</p>	
Username/Password	Use only if authentication is required.

Compatibility Mode	<p>Standard: WebDAV protocol (HTTP PUT/DELETE/MKCOL), in the case of HLS, DASH, and HSS formats. (With this compatibility mode, missing sub-folders are created using "MKCOL" HTTP request method and segment are removed after they have reached the retention period using "DELETE" HTTP request method).</p> <p>Akamai: HTTP POST in the case of HSS. WebDAV, with specific features, in the case of HLS and DASH.</p> <p>If you must publish to an Akamai CDN, then you must select Akamai for Compatibility Mode.</p> <p>Simple HTTP: Allows for only HTTP PUT requests to be sent. If enabled, VOS will not delete segment files after the Segment Retention Period configured in the destination profile is reached and VOS will not create the missing sub-folders.</p> <div style="border: 1px solid #f0e68c; padding: 10px; margin-top: 10px;"> <p>Note</p> <p>To use Simple HTTP, the destination folder must exist on the remote server or the remote server must automatically create the missing folders based on the PUT request (as VOS will not make any WebDAV "MKCOL" request when using Simple HTTP publishing mode). Automatically creating missing folders is not the standard behavior for most of the web servers supporting HTTP PUT. When deactivating "Flattened Structure" (such as the use of a different subfolder for each video profile) or activating "Rollover Segment Dir," VOS automatically pushes to sub-folders and it is mandatory to use a server that can create those sub-folders automatically.</p> </div>
Chunked Encoding	Allows you to send data in a series of chunks on a per-package basis.
Output Monitor	If the service will be encrypted and you want to be able to monitor clean video output, select Output Monitor and provide the Hostname for monitoring.

8. Optionally, configure additional outputs of the same type.
9. Click **Create**.

Creating and activating a playout service

Select the transcoding profile, service source and destination, and configure any add-ons to be used by the playout service.

Before you begin

[Configuring a playout source](#)

[Configuring a playout destination](#)

- From the **Configure Channels** app, navigate to the **Services** page. Click **+ Service**.

Result: The **Create Service** wizard opens.



- On the **Profile** tab, select the transcoding profile the service will use, and then click **Next**.
- On the **Source** tab, select the name of the primary source, and optionally, an alternate source / tertiary source, and then click **Next**.

Note

The input streams of the paired CloudLink instances must be identical.

- On the **Destination** tab, select the name of the destination to be used, and then click **Next**.
- If necessary, on the **Commit** tab, for **Program Number**, type a program number for the video channel.
- In the **Service Name** field, enter the name of the new service.
- Optionally, select the **Priority** drop-down menu for the service. Options are **Low**, **Normal**, or **High**. The default setting is Normal.

Note

You can use this Priority tag to quickly view the status and configuration of the high-priority services (and other priorities as well) in case any service is down and requires manual attention.

- Optionally, turn the **Redundancy** setting to **On** to activate service-level redundancy.

Info

In Redundancy Mode, VOS creates two services for the same channel (active-standby), using the same configuration. In the event that the active service fails, stream processing or packaging tasks failover to the standby service.

Note

Transcode services must have an alternate input source configured, or the service must use a paired CloudLink.

9. Optionally, turn the [Input Tracking](#) setting to **On** to activate the Input Service Tracking feature.
10. Optionally, turn the [Dynamic Program](#) setting to **On** to activate the dynamic program for the service.
11. Optionally, turn the [Source Failover](#) to **On** to activate source redundancy for the service.
12. Optionally, select the [Geo Redundancy](#) setting for the service. Options are **Auto**, **On**, or **Off**. The default setting is Auto.

 **Note**

If geo-redundancy is enabled on the VOS cluster, all services will be paired up between two VOS instances. This option allows pairing up partial services only instead of all services between two VOS instances for the geo-redundancy feature.

13. Select **Active** if you want the service to go online when you commit to the new service.
14. [Configure service add-ons](#) as required by the channel.

 **Note**

The **Blackout Slate** add-on enables you to override the channel output. If this add-on is not selected, the **Override** button in the Playout Monitor app will not be available.

15. Optionally, turn the [Mute Notifications](#) setting to **On** to prevent the notifications from being noticed.

 **Note**

Geo-redundancy notifications cannot be muted as they are related to global settings instead of service-specific settings.

16. When you have finalized the service settings, click **Commit**.

Configuring an external live feed

Playout channels support live primary events from both Zixi and CloudLink input sources. Configure live inputs in the [Configure Channels](#) app. Note the following requirements for live input sources:

- The live input source must match the frame rate and resolution defined for the playout source.
- The live input source can have multiple audio streams. The playout channel only uses languages from the input source that match the languages that have been defined for the playout source. The order of languages may be different than the playout source.
- The live input source may contain data streams; however, they are not used by the playout channel.

 **Note**

Input source redundancy is not supported by the playout channel.

Note

Video monitoring is limited to one operator while the input is not being used by a service. Video cannot be monitored when the input is being used by a service, even when the input is not on air.

1. From the **Configure Channels** app, navigate to the **Sources** page. Click **+ Source**.
2. In the **Input Source Name** field, enter the name of the new source.
3. If you wish to be able to filter by user-defined labels, enter a label in the **Labels** field.
4. Below **Inputs**, configure the **Signal Loss** input with the desired image file, or click **Remove** to delete the input if it is not required.
5. Click the **Add Input** icon, and then select **CloudLink** from the drop-down list.
6. For **Type**, select **Zixi** or **CloudLink**.
7. For Zixi inputs, refer to [Configuring a Zixi source input](#) for details.
8. For CloudLink inputs, refer to [Configuring a CloudLink source input](#) for details.
9. Click **Connect**.
Result: VOS discovers the input source after a few seconds. If it cannot find the input source, the following message will appear: No data found. Please check your source.
10. Choose a program from the list and, optionally, click **Play** to view the video source.
Result: If any issues with the transport stream are detected, then a **Grooming needed** alert appears.



11. If grooming is needed, proceed with grooming the source input.
12. From the **Add source** pane, click **Create** to add the source.

Result

External live sources are listed in the **Feed** widget in the Playout Monitor app. Playlist files must set the materialId to the CloudLink **Input Source Name** for scheduled live primary events.

VOS Playout Monitor app overview

Review the components of the Playout Monitor user interface.

Info

You must have a playout service configured in order to access the Playout Monitor app.

- [Channels source page](#)
- [Playout monitor page](#)

Channels source page

The **Channels source** page is the landing page for the Playout Monitor app. It displays a timeline for each playout service.

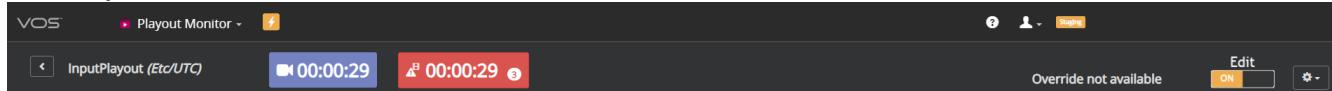
To view scheduled events, load schedules, and edit the on-air schedule, click the **Playout Source** on the left of the timeline.



Playout monitor page

You can monitor the channel timeline and perform master control operations from the **Playout monitor** page.

VOS Playout Monitor header



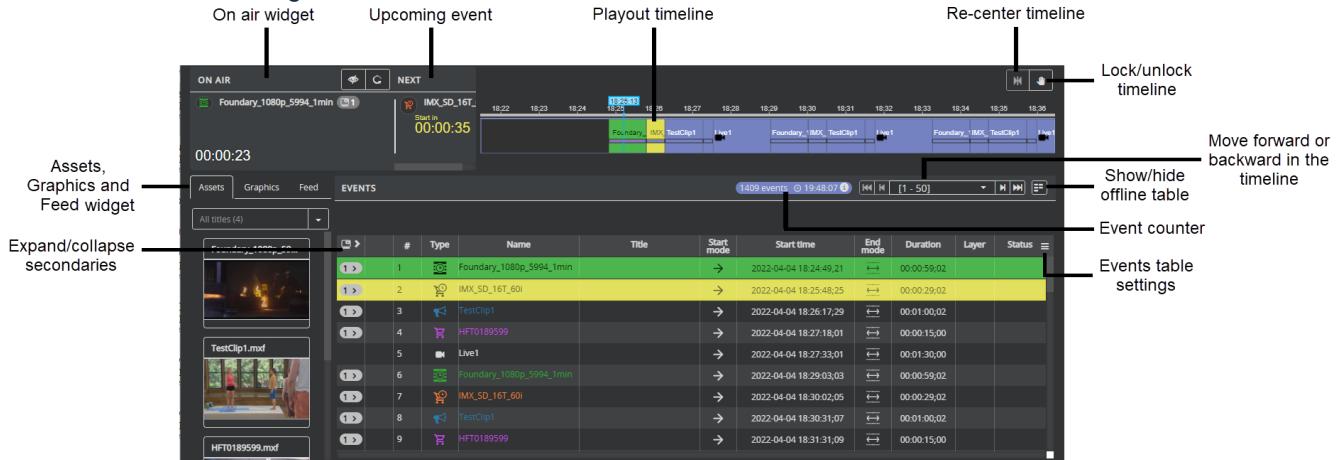
Channel name	Displays the channel name, as configured in the Configure Channels app.
Status ribbon	<p>Displays the following notifications:</p> <ul style="list-style-type: none"> Errors in the playlist, such as missing material or timing gaps/overlaps. Before the corresponding event goes to air, the status ribbon presents a countdown to the next error. An error count is displayed if there is more than one error. Countdown to the next live event. For live events with manual start mode, if the scheduled start time has passed and the event has not been taken yet, the countdown notification displays 00:00:00. <div style="border: 1px solid #ccc; padding: 10px; margin-top: 10px;"> ✓ Tip <p>Click the notification to focus on the corresponding event in the Events table and timeline.</p> </div>

Override mode	Allows you to override the channel output in case of an on-air emergency. The Blackout Slate service add-on must be enabled in order for this option to be available. For more information, refer to About Override Mode .
Edit mode	While in Edit mode, you can create, edit, and delete events, invoke Override mode, and do a manual Take Next.

Settings, Widgets & Actions

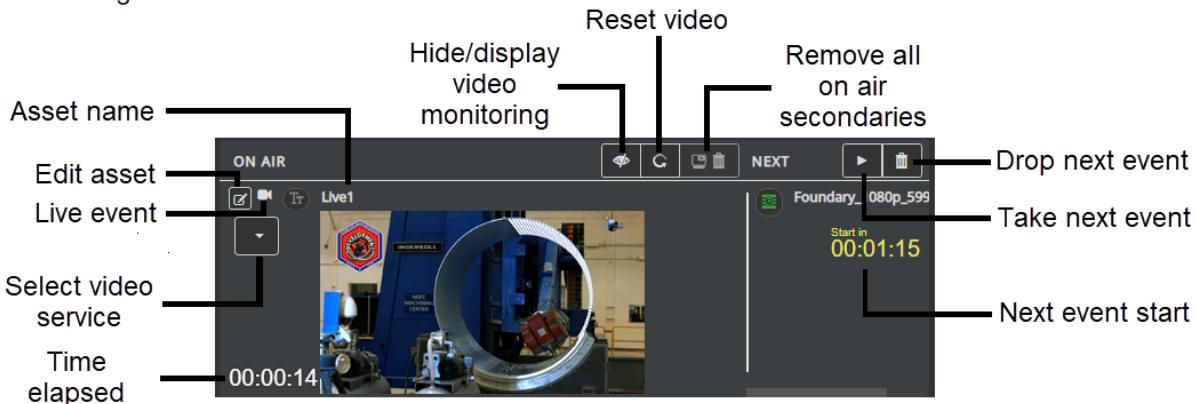
Settings	<p>Display: Choose to display event start time, duration, and SOM in milliseconds or timecode.</p> <p>Channel settings include the following:</p> <ul style="list-style-type: none"> • Lockout time for schedule reload: The period of time during which the on-air schedule will not be modified after you reload a schedule. For example, if you reload a schedule and the lockout time is 30 seconds, events from the new schedule will not go to air until 30 seconds after the schedule was loaded. Also, events from the new schedule whose start time is earlier than the playlist reload time + 30 seconds will be discarded. Events in the on-air schedule whose start time is later than the playlist reload time + 30 seconds will be discarded as well. The default lockout time is one minute. • Drop-frame timecode: UTC time of daily adjustment: To handle the drift of timecode in a 29.97/59.94 fps channel, the channel must be re-synched on a daily basis. Specify the UTC time at which the drop-frame time sync should occur (an integer between 0 and 23). The default value is 10.
Widgets	Allows you to customize widgets in the Playout Monitor app. If the interface is locked, click the Unlock icon to be able to hide/display and resize widgets.
Actions	<ul style="list-style-type: none"> • Import playlist: Click to browse to the playlist file location and load onto the timeline. • Export missing materials on disk: Click to export any missing materials in .csv format. • Export Playlist: Click to export the playlist in .xml format.

Events and Timeline widgets



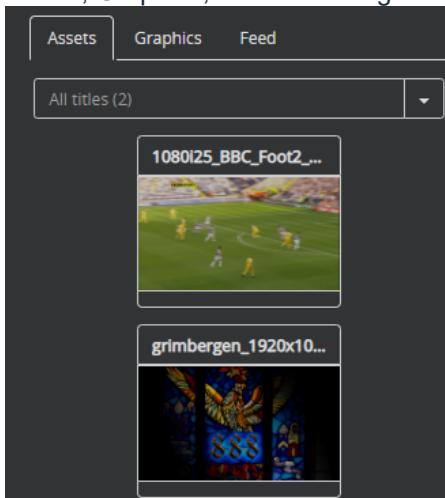
Re-center timeline	Returns the timeline to the current time (if you have dragged the timeline forward to see future events, for instance).
Lock/unlock timeline	When locked, the timeline remains stationary while the current time marker moves forward. When unlocked (default), the timeline moves forward while the current time marker remains stationary.
Jog backward/forward in playlist	The Events table displays 50 events at a time. For large playlists, you may use these controls to skip to the next/previous block of events, or to the end/beginning of the playlist.
Events Table settings	Allows you to hide/display and reorder columns in the Events table.
Expand/collapse secondaries	Click to expand or collapse all secondary events in the Events table.
Select event	Select an event to be able to edit details, remove, or create an event before or after.
<p>Note</p> <p>Edit mode must be activated.</p>	

On-air widget



Drop Next event	Click to drop the next event. Note that Edit mode must be activated in order for the icon to appear. The icon will not appear two seconds before the conclusion of a primary event, or two seconds into a primary event.
Take Next event	Click to take the next scheduled event to air. Note that Edit mode must be activated in order for the icon to appear. The icon will not appear two seconds before the conclusion of a primary event, or two seconds into a primary event. Note that if the next event has manual start mode, then the On-Air widget does not display information for the next event.

Assets, Graphics, and Feed widgets



Tip

- Simply drag and drop an asset, graphic, or live input source onto the **Events** table to create a new event.
- Click the pull-down menu to change the display between icon view or list view.
- Hover over any item to display the source file information.

Assets widget	Displays assets available in the Asset Acquisition library.
Graphics widget	Displays graphics files that have been uploaded to the VOS using the Web Uploader in Asset Acquisition.
Feed widget	Displays live input sources that have been configured in the Configure Channels app.

Related information

[About Override mode](#)

[Configuring an external live feed](#)

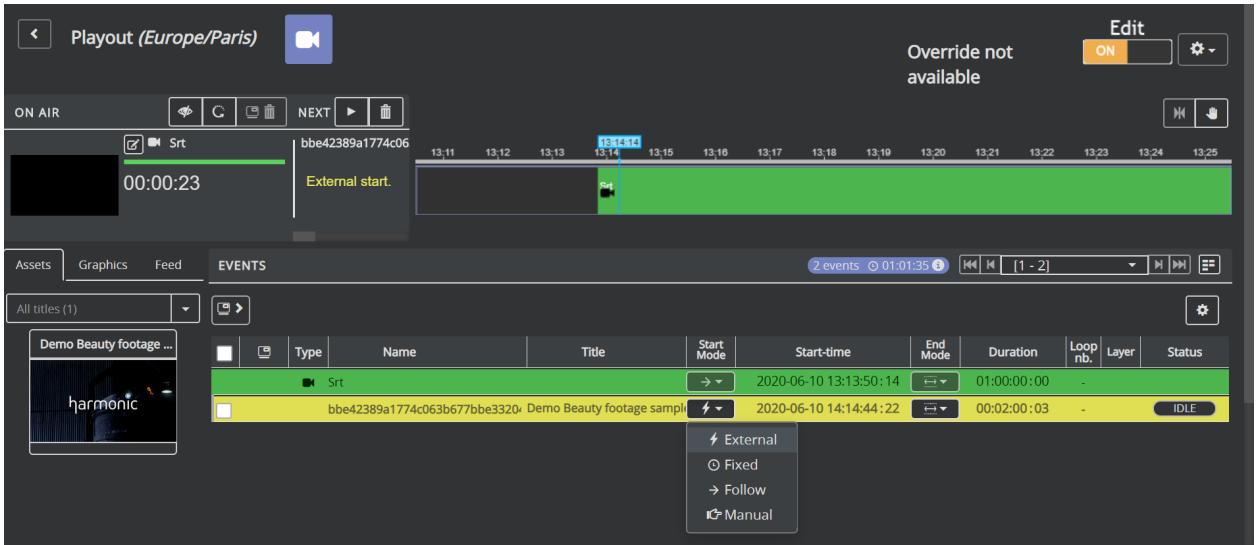
Triggering SCTE-35 dynamic ad insertion

Note

In order to trigger a take-next dynamic ad insertion, a playout source must be configured with an SCTE-35 data stream.

- Launch the **Playout Monitor** app.
- Select a live event.

3. Add the next event with the **Start Mode** set to **External**.



Note

The supported types of SCTE-35 messages are the following:

- time_signal with segmentation_descriptor for Distributor Advertisement Start (0x32) or Distributor Placement Opportunity Start (0x36)
- splice_insert with out_of_network_indicator = 1

VOS playlist schema

VOS supports XML playlist files based on the Polaris Play: Playlist Control (OPC) playlist schema. BXF playlist files are also supported.

Sample XML playlist

```

1  <?xml version="1.0" encoding="utf-8"?>
2  <Schedule channel="6e237b24-64a5-66a8-2811-b5eac96abfba" scheduleStart="2018-07-01T14:37:00.00Z"
3   schemaVersion="1.5">
4   <Primary>
5     <PrimaryEvent endMode="Manual" scheduledDuration="00:00:59;28" scheduledStart="2018-07-01 14:38:00.02"
6       startMode="Fixed" >
7       <Description>An event description</Description>
8       <VideoMaterial materialId="Live1" source="External In" title="My Live1"/>
9       <GraphicsEvent endMode="OffsetFromEnd" endOffset="+00:00:00:00" layer="1" startMode="OffsetFromStart"
10      startOffset="+00:00:00:00" templateName="1080i60-NewsTicker-RSS.swf" >
11        <GraphicsText boxNumber="0">http://www.server.ca/cmlink/rss-topstories</GraphicsText>
12      </GraphicsEvent>
13    </PrimaryEvent>
14    <PrimaryEvent endMode="Duration" scheduledDuration="00:00:59;28" scheduledStart="2018-03-01
15      14:39:00;02" startMode="Fixed" >
16      <Description>Description of the second event</Description>
17      <VideoMaterial audioProfile="" materialId=
18        "https://s3-us-west-2.amazonaws.com/Customer-s3-bucket/Assets/MyAsset1.mp4" som="00:00:59;28" source=
19        "Player A" title="My event 02" />
20      <GraphicsEvent duration="00:00:20;02" endMode="Duration" layer="2" startMode="OffsetFromStart"
21      startOffset="+00:00:10:00" templateName="1080i60-NewsTicker-RSS.swf" title="a graphic title" >
22        <GraphicsText boxNumber="0">http://www.cbc.ca/cmlink/rss-topstories</GraphicsText>
23      </GraphicsEvent>
24    </PrimaryEvent>
25    <PrimaryEvent endMode="Duration" scheduledDuration="00:00:59;28" scheduledStart="2018-03-01
26      14:40:00;02" startMode="Follow" >
27      <VideoMaterial audioProfile="stereo1" materialId=
28        "https://s3-us-west-2.amazonaws.com/Customer-s3-bucket/Assets/MyAsset2.mp4" som="00:00:30;00" source=
29        "Player A" title="My event 03" />
30      <GraphicsEvent endMode="OffsetFromEnd" endOffset="-00:00:20:00" layer="2" startMode="OffsetFromStart"
31      startOffset="+00:00:10:00" templateName="1080i60-NewsTicker-RSS.swf" title="A graphic title" />
32    </PrimaryEvent>
33  </Primary>
34 </Schedule>

```

Schedule parameters

channel	<p>This refers to the channel UUID. You can obtain the UUID as follows:</p> <ol style="list-style-type: none"> From the Public API app, click Playout Backend. Select GET /playoutcontrol/v1/channels, and then click Try it out!. In the Response Body, find the channelId parameter. This is the UUID text that you can copy and paste into the playlist file. <p><i>Channel UUID</i></p>  <pre>[{"channelId": "933d037c-d5ff-ea0c-b963-14eea387e938", "channelName": "PlayoutSrc"}]</pre> <div style="border: 1px solid #ccc; padding: 10px; margin-top: 10px;"> <p>Tip</p> <p>You can override this parameter when you upload the playlist using the Public API app (for example, if you want to copy the playlist file to a paired channel).</p> </div>
scheduleStart	Determines the schedule start date and time. VOS uses this parameter to determine playlist boundaries. A replacement playlist must have the same scheduleStart value as the original playlist.

<PrimaryEvent> parameters

startMode	<p>Determines how the event will be taken to air:</p> <ul style="list-style-type: none"> fixed: Event is taken to air at its scheduled start date/time. follow: Event is taken to air when the current on-air event ends. manual: Requires a Take Next trigger to take the event to air.
scheduledStart	Determines when fixed start events are taken.

endMode	Determines how the event is terminated: <ul style="list-style-type: none"> duration: The event ends when the scheduled duration expires. A primary event with duration end mode can be preempted by an upcoming fixed start event. manual: The event remains on-air until a Take Next command is received from the operator, or it is preempted by an upcoming fixed start event.
scheduledDuration	Determines the length of time that a primary event stays on-air. For manual endMode events, the duration does not end the event.

<VideoMaterial> parameters

materialId	<ul style="list-style-type: none"> For file-based assets: <ul style="list-style-type: none"> If the asset is already registered in Asset Acquisition library, you can provide either the file name or the file name with extension. If the asset ingest shall be triggered on playlist reception, then you must provide the full S3/Blob storage URL. For a live primary event generated by an external input, provide the CloudLink input source name.
source	For a live primary event, you must set the source to External In. For file-based events, you may omit the source parameter, or set it to Player A.
som	Specify the Start of Material (SOM) in one of two ways: <ul style="list-style-type: none"> As a frame offset from the beginning of the file, for example +00:00:59;28 As the timecode value of the frame at which playback will begin, for example 05:02:23:21 (not to be expressed in milliseconds)

audioProfile	(MXF files with PCM audio only) Specify the audio grooming profile to be used for the primary event. Audio grooming profiles are configured in the Asset Acquisition app. Refer to Creating an audio grooming profile for MXF files for more information.
	<p> ⓘ Info</p> <p>The languages specified in the grooming profile must match the languages defined for the playout source.</p> <p>⚠ Note</p> <p>For .mp4 files, it is not possible to specify an audio grooming profile. For the first audio, the first stereo pair is played. For the second audio, the second stereo pair is played, and so on.</p>

<GraphicsEvent> parameters

templateName	Provide the graphic template file name.
layer	Specify the layer that the graphic template will be loaded on. Up to 8 layers are supported.
startMode	<p>The timing of the start of a secondary event is determined by an offset from the start or end of the primary event to which it is attached (specified in startOffset). There are two secondary event start modes:</p> <ul style="list-style-type: none"> • offsetFromStart: The secondary event will go to air at a time relative to the start of its primary event. Negative values are used to specify that the secondary event is scheduled to start before the start of the primary event, and positive values are used to specify that the secondary event is scheduled to start after the start of the primary event. • offsetFromEnd: The secondary event will go to air at a time relative to the end of its primary event. Negative values are used to specify that the secondary event is scheduled to start before the end of the primary event, and positive values used to specify that the secondary event is scheduled to start after the end of the primary event.

endMode	<ul style="list-style-type: none"> offsetFromEnd: The secondary event will end at a time offset relative to the end of its primary event (specified in endOffset). Negative values are used to specify that the secondary event is scheduled to end before the end of the primary event, and positive values used to specify that the secondary event is scheduled to end after the end of the primary event. duration: The secondary event will end after the time specified in the duration parameter.
title	Optionally, provide a title for the event.
<Graphics Text>	(.swf files only) If the graphic template supports dynamic text fields, you may specify the text and box number here. For an RSS News Ticker text field, enter the URL of the RSS news feed.

Related information

[Loading a playlist](#)

Loading a playlist

You can load a playlist from the Playout Monitor interface or from the REST API.

- [Loading a playlist from the Playout Monitor app](#)
- [Loading a playlist from the Public API](#)

Loading a playlist from the Playout Monitor app

When you load a playlist from the Playout Monitor app, the channelId in the playlist file is ignored and the current Playout channel is used instead. You also have the option to change the schedule start time.

1. Click **Settings > Import Playlist**, and select the playlist file you want to load.
2. In the **Import playlist** dialog, confirm or change the **Schedule start time** and click **OK** (checkmark icon).

Note

Once a schedule has started playing, you cannot load a schedule with an earlier scheduled start time. If you attempt to load a schedule with an earlier scheduled start time, an error message will be displayed in the UI for a few seconds indicating the [practicable Schedule Start Time](#).

For example, if the Tuesday schedule has started, you cannot load a schedule for Monday (yesterday). You can load a schedule for Thursday, and can edit and modify the playlist to start the first event of the Thursday schedule. If you try to load a schedule for Wednesday, an error occurs.

Info

The Schedule start time for the playlist OPC XML file is based on UTC. The Playout Monitor Schedule start time is based on the time zone you defined in **Settings > Display**. Make sure that the correct time zone is indicated on the playlist. An error occurs if the Schedule start time is improperly set.

It is recommended that the playlist (OPC XML file) should be created and uploaded using the time format (milliseconds), as: 2019-10-18T17:00:05.000Z.

Result: The playlist loads. If you changed the **Schedule start time**, all events are updated accordingly.

Loading a playlist from the Public API

You can load XML and BXF playlists using the Public API app, and you have the option to override the channel that the playlist is associated with.

1. Navigate to the Public API app.
2. If you want to override the channel that the playlist file is associated with, then do the following:
 - a. Click **Playout Backend**, then select GET /playoutcontrol/v1/channels, and click **Try it out!**.
 - b. In the **Response Body**, find the **channelId** parameter and copy the value. This is the UUID.

```

Response Body
[{"channelId": "933d837c-d5ff-ea0c-b963-14eea387e938", "channelName": "PlayoutSrc"}]
  
```

3. From the Public API app, click **BxfControlAdaptor**, click POST /bxsf-control-adapter/v1/opc/{playlist_file} and configure the following parameters:

playlist_file	Enter a name that will be used to refer to the playlist once it has been uploaded to the VOS.
channel_id	If you want to override the channel ID that is stored in the playlist file, then paste the UUID from step 2 here.
schedule	Browse to and select the playlist file you want to upload.

4. Click **Try it Out!**

Creating a primary event

You can create file-based and live primary events by simple drag-and-drop from the **Assets** or **Feed** widget. You can also use the **New primary event** dialog to create file-based primary events.

Note that if you want to specify an audio grooming profile for a primary event, you must do so using the **New Primary Event** dialog.

1. Click the **Edit** slider button to activate Edit mode.

2. Create a primary event using one of the following methods:

- Select a file-based video asset from the **Assets** widget, or select a live input from the **Feed** widget, and then drag it to the **Events** table before the first event, between two events, or after the last event.

A new primary event is automatically inserted. To edit the event details, select the event on the **Events** table and click **Edit**.

- On the **Events** table, select a primary event and click **Create event before** or **Create event after**.

The **New Primary Event** dialog opens, where you may configure the primary event details.

Configure the primary event details:

Asset	If the asset is already registered in Asset Acquisition library, you can provide either the file name or the file name with extension. If the asset ingest is triggered on playlist reception, then you must provide the full S3/Blob storage URL.
Title	(Optional) Type the title of the primary event.
Description	(Optional) Type a description of the primary event.
Start	Specify a start mode for the primary event: <ul style="list-style-type: none"> • Follow: A follow start mode event is taken to air when the current on-air event ends. Automatic time ripple is applied to follow start events. If the first event in a playlist has a follow start mode, it is treated as a manual start event and requires a Take Next command to go to air. If there is no on-air event, or the on-air event has a manual end mode, the next follow event is not automatically taken to air. A Take Next command is required to advance the playlist. • Fixed: A fixed start mode event is taken to air at its scheduled start date/time. • Manual: A manual start mode event requires a Take Next trigger to go to air.

Duration	<p>Specify an end mode for the primary event:</p> <ul style="list-style-type: none"> • Duration: A primary event with duration end mode will end when the scheduled duration for the event expires. A primary event with duration end mode can also be preempted by an upcoming fixed start event. • Manual: A primary event with manual end mode remains on-air until a Take Next command is received from the operator, or it is preempted by an upcoming fixed start event.
Start of Material (SOM)	<p>Specify the starting point for playback of video clips in one of the following ways:</p> <ul style="list-style-type: none"> • As a frame offset from the beginning of the file • As the timecode value of the frame at which playback will begin
Audio Profile Name	<p>(MXF files with PCM audio only) Specify the audio grooming profile to be used for the primary event. Audio grooming profiles are configured in the Asset Acquisition app. Refer to Creating an audio grooming profile for MXF files for more information.</p> <div style="border: 1px solid #ccc; padding: 10px; margin-top: 10px;"> <p>i Info</p> <p>The languages defined in the grooming profile must match the languages defined for the playout source.</p> </div> <div style="border: 1px solid #fca; padding: 10px; margin-top: 10px;"> <p>⚠ Note</p> <p>For .mp4 files, it is not possible to select an audio grooming profile. For the first audio, the first stereo pair is played. For the second audio, the second stereo pair is played, and so on.</p> </div>

3. Click **Create or Save**.
4. When you are finished editing the playlist, click the **Edit** slider button to deactivate the Edit mode.

Editing a primary event

Operators should note that confirmation is not required when editing or deleting primary events.

 **Tip**

You may edit some primary event details directly in the **Events** table.

 **Note**

You can only edit the **Duration** of the *on-air* primary event.

1. Click the **Edit** slider button to activate Edit mode.
2. On the **Events** table, check the box next to the primary event you want to edit and then click **Edit**.
3. In the **Edit primary event** dialog, modify the parameters as needed and then click **Save**.
Refer to [Creating a primary event](#) for a description of primary event parameters.
4. To delete a primary event, check the box next to the primary event on the **Events** table, and then click **Remove**.
Result: The primary event and its associated secondary events are deleted.
5. To move a primary event, drag the event to the desired position in the playlist.
6. When you are finished editing the playlist, click the **Edit** slider button to deactivate Edit mode.

Creating a secondary event

You can create a secondary graphics event by simple drag-and-drop from the **Graphics** widget. Both live and file-based primary events support secondary graphics events. The following file types can be used to create secondary events:

- JPG
- PNG
- TGA
- SWF
- FLV
- WebM
- WAV
- HTML5

 **Info**

You can create a secondary event for the on-air primary event. Note that the secondary event will be created with a start offset that gives it a start time of 2 seconds in the future.

Before you begin

Upload graphic template files using the **Web Uploader** in the Asset Acquisition app, or using the Asset Acquisition REST API.

1. Click the **Edit** slider button to activate Edit mode.

- Select an image file from the **Graphics** pane, drag it to the **Events** table and drop it onto the related primary event when the blue rectangle appears.

#	Type	Name	Title	Start mode	Start time	End mode	Duration	Layer	Status
1	Live1			→	2022-04-05 17:53:27;26	→	00:01:30;00		
2	Foundary_1080i_dve-squeeze...	webm-falling-skies-10...		→	2022-04-05 17:54:57;26	→	00:00:59;02	1	
3	IMX_SD_161_60	1080i_dve-squeezebac...		E	2022-04-05 17:54:57;26	E	00:00:59;02	1	
4	1080i_NewsTicker1			→	2022-04-05 17:55:57;00	→	00:00:29;02		
5				E	2022-04-05 17:55:57;00	E	00:00:29;02	2	

Result: A secondary event is created (no confirmation is required). By default, the secondary event is assigned to the first graphic layer and inherits the duration of the primary event. Refer to [Editing a secondary event](#) for instructions on configuring the layer, start and end mode, and dynamic text fields.

3. Optionally, repeat the previous step to create additional secondary events.

By default, additional secondary events will be assigned to the next sequential graphic layer. On the **Events** table and on the timeline, secondary events are sorted first by start date/time, and then by layer. When multiple secondary events share the same start time, the secondary event that has been placed on the highest layer appears first.

Info

Note that changing the secondary event start time and/or layer may impact the order in which secondary events are sorted.

4. Click the **Edit** slider button to deactivate Edit mode.

Editing a secondary event

Note that confirmation is not required when editing or deleting secondary events.

Tip

You can edit some secondary event details directly in the **Events** table.

1. Click the **Edit** slider button to activate the Edit mode.
2. If secondary events are collapsed, click the **Expand all secondaries** icon ().

#	Type	Name	Title	Start mode	Start time	End mode	Duration	Layer	Status
1		HFT0189599		→	2022-04-05 17:44:46;06	→	00:00:15;00		
2		webm-falling-skies-10...		E	2022-04-05 17:44:46;06	E	00:00:15;00	1	
3	Live1			→	2022-04-05 17:45:01;08	→	00:01:30;00		
4	Foundary_1080p_1			→	2022-04-05 17:46:31;08	→	00:00:59;02		
5		1080i_dve-squeezebac...		E	2022-04-05 17:46:31;08	E	00:00:59;02	1	

3. Check the box for the secondary event you wish to edit and then click **Edit**.

Result: The **Edit secondary event** dialog opens, where you can edit the following details:

Layer	Choose the layer that the graphic template will appear on. Up to eight layers are supported.
Start	Select the desired start mode and then specify the offset: <ul style="list-style-type: none"> • Offset from start: The secondary event will go to air at a time relative to the start of its primary event. Negative values are used to specify that the secondary event is scheduled to start before the start of the primary event, and positive values are used to specify that the secondary event is scheduled to start after the start of the primary event. • Offset from end: The secondary event will go to air at a time relative to the end of its primary event. Negative values are used to specify that the secondary event is scheduled to start before the end of the primary event, and positive values used to specify that the secondary event is scheduled to start after the end of the primary event.
End	Select the desired end mode: <ul style="list-style-type: none"> • Offset from end: The secondary event will end at a time offset relative to the end of its primary event. Negative values are used to specify that the secondary event is scheduled to end before the end of the primary event, and positive values used to specify that the secondary event is scheduled to end after the end of the primary event. • Duration: The secondary event will end after the time specified in the Duration field has passed.
Boxes	(.swf files only) If the graphic template supports dynamic text fields, you may update the text here. If you are editing the text field of an RSS News Ticker, type in the URL of the RSS feed. Note that the current contents of the text field are not displayed in the Edit secondary event dialog.
Grooming profile	Click the pulldown icon to select from the available grooming profiles.

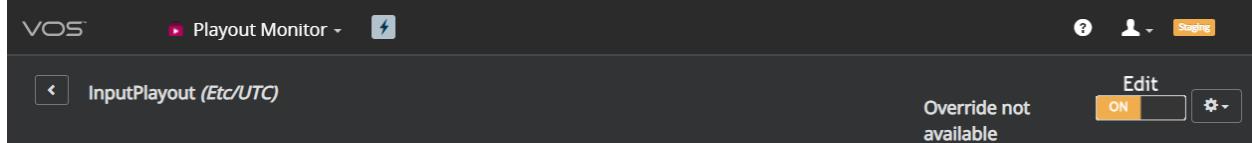
4. To delete the secondary event, click **Remove**.
5. When you have finished editing the secondary event, click **Save**.

About Override mode

In case of an on-air emergency, the VOS Playout Monitor allows you to quickly override the channel output with a slate image.

Note the following about the Override mode:

- In order to use the Override mode, you must activate the **Blackout Slate** add-on when you configure the playout service. If this add-on is not activated, the **Override** button is not displayed in the Playout Monitor app.



- In the Playout Monitor app, you must activate the **Edit** mode in order to use the **Override** button.
- When Override mode is activated, the pre-configured slate image goes to air, audio is silenced, and a notification is generated.
- The slate image remains on air until you click the **Override** button off.

Supported alarms

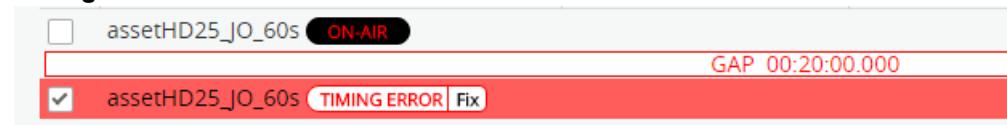
VOS warns the operator of certain errors, such as timing errors, in the Playout Monitor interface.

Timing errors

Primary events

Gap	There is a gap between two consecutive primary events. The gap error indicates the amount of the gap in timecode or milliseconds.
Overlap	A primary event is scheduled to start before the previous event ends. The overlap error indicates the amount of overlap in timecode or milliseconds. When an overlap error is present, the event with the later start time is played while the event with the earlier start time is preempted.
Asset duration	The asset duration is shorter than the primary event duration plus the SOM. In this case, a Fix button is provided, allowing the operator to automatically update the event duration to match the asset duration. Note that Edit mode must be activated in order to correct the error.

Timing error with Fix button



Secondary events

Start/End timing error	A secondary event is flagged with a timing error when its end time is before its start time. Such events are not played.
Overlap	A secondary event is flagged with an overlap error when its layer is used by another secondary event at the same time. When an overlap error is present, the event with the later start time is played while the event with the earlier start time is preempted.

Asset errors

Missing asset	A video clip or graphic template is missing and it is scheduled to air within 24 hours. A system notification is also generated.
Invalid asset	An asset is not valid (frame rate variable, truncated asset, etc.) and it is scheduled to air within 24 hours. A system notification is also generated.
Frame rate error	An asset has a frame rate that is not compatible with the playout source and is scheduled to air within 24 hours. A system notification is also generated.

Missing asset error

Status	Start	Name	Title	Duration
MISSING	Mon, 14:12:00.011	myclip2	GAP 00:12:00.019	00:00:59.993

Live event errors

Invalid format	The video resolution and framerate of the input source are not identical to the resolution and frame rate defined in the playout source.
Missing source	The CloudLink input source has not been configured in the Configure Channels app.

About as-run logs

As-run logs report the status of playout events after they have gone to air. They are saved to the VOS and you can download them to the local client using the Public API.

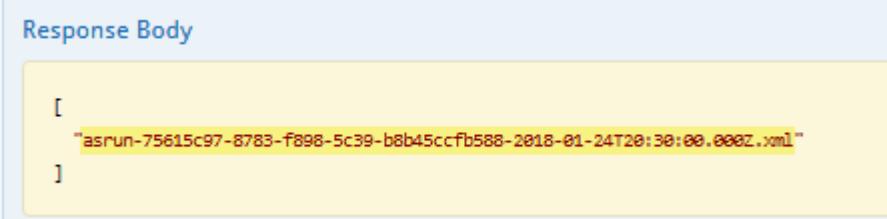
Event status descriptions

Event status	Description
Aired OK	No errors were detected during playout.
Joined in progress	Material was partially played; joined in progress due to initial schedule load/advance, or Override mode being turned off.
Pre-empted	Material was partially played; ended early due to truncation by Fixed start, manual take, or Override mode being turned on.
Did not air	Event executed while channel override is active.
Content discrepancy	Material not played because there is a problem with the file contents or the file is incompatible with the channel.
Missing media	Material to be played is missing (not available).
Technical difficulty	Control errors were detected during playout, for example, cannot load the clip.
Did not air (service stopped)	Event did not air due to service disruption.

Downloading as-run files

You may download as-run files using the REST API.

1. From the Public API app, click **BxfControlAdaptor**.
2. Select GET /bxft-control-adaptor/v1/asrun, and then click **Try it out!**
3. In the **Response Body**, copy the name of the as-run file you want to download.



4. Select GET /bxft-control-adaptor/v1/asrun{asrun_file}, and then paste the as-run file name in the **Value** field.
5. Click **Try it out!**
6. In the **Response Body**, click the link to download the as-run file to your local machine.

Turning on redundancy for a service

You can enable redundancy for a service. In Redundancy Mode, VOS creates two services for the same channel (active-standby), using the same configuration. In the event that the active service fails, stream processing or packaging tasks fail over to the standby service.

1. From **Configure Channels > Services**, select the service to edit.
2. Turn the **Redundancy** setting to **On** to activate service-level redundancy.

The screenshot shows the 'Edit service' dialog box with the following configuration:

- SERVICE NAME:** weather-HD Sinclair DT - Dickson-
- SOURCE:** Primary (selected)
- PROFILE:** HD Sinclair DT - Dickson v.15
- DESTINATION:** weather
- REDUNDANCY:** ON (selected)
- DYNAMIC PROGRAM:** OFF
- Add-ons:** checked

Note

Transcode services must have an alternate input source configured, or the service must use a paired CloudLink.

3. Click **Save**.

Muting notifications for a service

During a maintenance window, you may need to mask the notifications related to a service to reduce the noise generated.

1. From **Configure Channels > Services**, select the service you want to edit.

2. Turn the **Mute Notifications** settings to **On** to mute any notifications for this service.

The screenshot shows the 'Edit service' dialog for a service named 'Playout-1-Multiscreens Silver SD-DASH'. The dialog is divided into several sections:

- SERVICE NAME:** Playout-1-Multiscreens Silver SD-DASH
- SOURCE:** Primary (selected), Alternate, Tertiary
- PROFILE:** Multiscreens Silver SD v.2
- DESTINATION:** DASH
- PROGRAM NUMBER:** 1
- RANK:** 1
- REDUNDANCY:** OFF
- INPUT TRACKING:** OFF
- DYNAMIC PROGRAM:** OFF
- GEO REDUNDANCY:** AUTO
- Add-ons:** (checkbox)
- Buttons at the bottom:** Delete, Save (highlighted with a red box), Online, Test, Offline, MUTE NOTIFICATIONS (highlighted with a red box), OFF, Close.

Turning on dynamic program for a service

When the dynamic program function is enabled, removing the program from the input source will lead to the program in output PAT get removed. Besides, other Elementary Stream PIDs (e.g. video/audio) and PMT PID will also be removed from the output stream. Similarly, adding the program to the input source will lead to the program in output PAT get added. Other Elementary Stream PIDs (e.g. video/audio) and PMT PID will also be added to the output stream.

1. Navigate to **Configure Channels > Sources** to create a TS source. Select the target program number (e.g. Program Number = 1 in below example) and groom the source.

Edit source

INPUT SOURCE NAME
Dynamic Program - Source

LABELS
+ Label

Used in 1 services.

INPUTS

Primary IP	Signal loss	+
226.6.6.6	e.g., 192.168.0.0	30006
	e.g., 81	+ SSM
		Primary

Connect **1:j2** ▶ Groom ▾

x Remove

Delete Save Close

2. Navigate to **Configure Channels > Destinations** to create a TS destination.
3. Navigate to **Configure Channels > Services** to create a service with the **Dynamic Program** enabled and the service activated.

Sources Destinations Services Settings

All services (2)

Edit service

SERVICE NAME who1	SOURCE Primary Alternate Dynamic Program - Source ▶	PROFILE IPTV SD 25 v.1	DESTINATION Dynamic Program - Dest Broadcast (IP) 226.6.6.8
PROGRAM NUMBER 2	PRIMARY Dynamic Program - Source		
RANK 1			
REDUNDANCY OFF			
DYNAMIC PROGRAM OFF			
SOURCE FAILOVER GLOBAL			
<input checked="" type="checkbox"/> VIDEO MISSING <input type="checkbox"/> SCRAMBLED VIDEO PID <input checked="" type="checkbox"/> CONTINUITY COUNTER ERROR <input type="checkbox"/> AUDIO PID MISSING <input checked="" type="checkbox"/> Add-ons			

Result: From the **Logs** app, the dynamic program event is recorded to the domain log.

The screenshot shows the VOS Logs application interface. At the top, there are tabs for 'Logs' (selected), 'Metrics', and 'Metrics'. Below the tabs, there are filters for 'Critical', 'Warning', 'Important', and 'Dynamic Program X + Users and messages'. The search bar shows 'FROM 02/13/2020 04:10 PM' and 'TO Now'. There are also 'Settings' and 'Staging' buttons. The main area displays a log entry with a red border around it. The log entry details are as follows:

- Date: 02/14/2020 03:43:50 PM
- Level: IMPORTANT
- Source: SSPE-worker
- Message: [Dynamic Program Triggered] Output Program 1 and Output Pid {632, 831, 480, 444} removed in service audio-pid-source-iPTV
720p 50 NEW-audio-pid-dest with serviceId b3a8fe03-4908-64ec-4f94-5573e0d88048

Input service tracking

The input service tracking function automatically detects input PIDs changes and update the PID mapping.

If the input tracking is enabled, VOS will keep track of the changes on the target program of input TS based on the program number specified in source configuration. VOS will not report PID missing when input video/audio/data PID of the input source is changed.

Input tracking for the transport stream components:

- PMT PID change
- PCR PID change
- Video PID change
- Video Codec change
- Audio PID change
- Audio Codec change
- Audio Language change
- Number of Audio change

Input tracking for the subtitle and SCTE-35 components:

- SCTE35 PID change
- Number of SCTE-35 change
- DVB Subtitle PID change
- DVB Subtitle Language change
- Number of DVB Subtitle change
- Teletext PID change
- Teletext Language change
- Number of Teletext change

Related information (How to activate input service tracking)

[Creating and activating an IPTV service](#)

Configuring source failover for a service

You can enable the custom parameters to determine how the source redundancy is triggered for a service.

- From **Configure Channels > Services**, select the service to edit.

- Navigate to **Source Failover**, switch the toggle from **Global** to **Custom** to configure source fail-over parameters for the particular service.

Note

The Global settings for source fail-over can be configured through **Configure Channels > Settings > Advanced**. If Custom is selected for **Source Failover**, the custom settings will override the global settings.

- Enable the following parameters for Source Failover:
 - Video Missing:** If enabled, source redundancy will be triggered when video PID is missing from the source. This is also applicable when the video source is non-decodable.
 - Scrambled Video PID:** If enabled, source redundancy will be triggered within a few seconds when one or more video packet is scrambled in the primary input source (consistent with PID missing).

- c. **Continuity Counter Error:** If enabled, source redundancy will be triggered when the number of CC errors exceeds specific threshold. This parameter can ONLY be enabled/disabled by per-service source redundancy trigger instead of global setting.
- d. **Audio PID Missing:** If enabled, source redundancy will be triggered when audio PID is missing from the source.

4. Click **Save**.

Configuring service add-ons

The availability of service add-ons depends on the type of service you have configured. Before enabling service add-ons, you must create a service from an existing source, transcoding profile, and destination.

Configure add-ons as required by the service:

- If the service supports a channel logo, enable the **Logo** add-on and configure the following settings:

Image	Click the Edit icon to select an image in the VOS file system, or upload a new image file.
Placement	Indicate the desired position of the logo.
Offset	Indicate the horizontal and vertical offset (relative to the Placement) in pixels.
Define Logo Per Video Profile	If enabled, you can define a logo per video profile of the Lab Wizard profile for the multiscreen service.

- If the service supports graphic templates, enable the **Graphics** add-on and then configure the following settings:

Template	Click the Edit icon to select a graphics template file on the VOS file system, or to upload a new file.
RSS URL	You can configure VOS to fetch text field data from an RSS feed.

- For multiscreen services: If the service is to be encrypted, enable the **DRM** add-on and then select a DRM system and resource for each package type.

⚠ Note

You must configure DRM systems in the Scrambling app.

- For linear services: If the service is to be scrambled, enable the **CAS** add-on and then configure the required parameters.

⚠ Note

You must configure CAS systems in the Scrambling app.

- If the service supports SCTE-35 video insertion, enable the **Video Insertion** add-on and then configure the following:

Acquisition Point ID	Type the ID of the Signal Acquisition System.
-----------------------------	---

⚠ Note

For a Kubernetes cluster with the ESAM End Point enabled, type in the **ESAM Acquisition Point ID**.

- To integrate a traffic system, enable the **Traffic** add-on and then configure the following:

Traffic ID	Type the ID of the traffic system.
-------------------	------------------------------------

- To integrate Scheduler360, enable the **Scheduler360** add-on and configure the following:

Channel ID	Type the ID of the Scheduler360 channel.
-------------------	--

⚠ Note

VOS services can receive OPC playlists from the configured Scheduler360 channel.

- To integrate a parental control management API server, enable the **Timed Event** add-on and select Parental Control from the **Timed Event Type** drop-down menu:

⚠ Note

The Parental Control from the Timed Event add-on is service affecting. Only OTT services are supported.

Configure the following for the Parental Control:

Channel ID	Assign a unique ID to the channel (up to 36 characters).The ID is used by the Parental Control API to identify the service.
Callback URL	Type the API endpoint used to listen on the parental control insertion status.

- If required, enable the **Affiliate** add-on and then provide the **Affiliate ID**.
- Optionally, enable the **Time Adjustment** add-on and then apply a time offset to adjust for channel latency due to (for example) processing time.

- If the service supports SCTE-35 blackout slate, enable the **Blackout Slate** add-on and then configure the slate image.

Note

You must enable this add-on to be able to invoke Override mode in the Playout Monitor app.

- To be able to monitor a live transport stream from an HSP endpoint, enable the **Input Monitoring** add-on.
Result: You can obtain the input monitoring URL for an active service in the Monitor Channels app.

Related information

[Uploading image files](#)

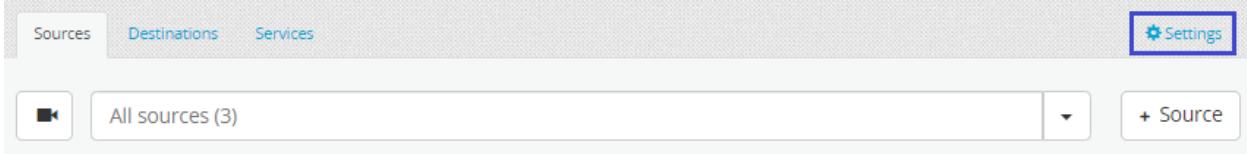
[Adding a DRM system](#)

[Adding an external CAS](#)

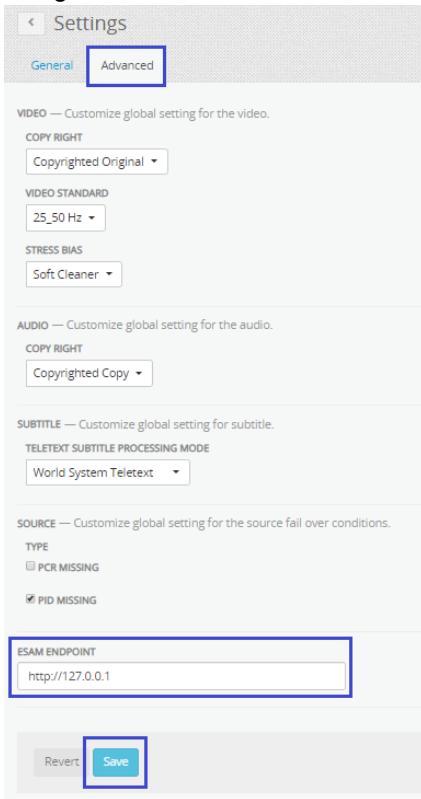
Configuring ESAM endpoint

For a VOS Kubernetes cluster, you can configure ESAM endpoint for enabling SCTE-35 insertion via ESAM out-of-band channel.

1. From the **Configure Channels** app, click **Settings** at the top right corner of the screen.



2. Navigate to the **Advanced** tab and type in the **ESAM EndPoint**.



3. Click **Save**.
4. From the **Configure Channels** app, navigate to the **Sources**, **Destinations**, and **Services** to create a service with SCTE-35 source configured.
5. From the **Services** page, enable the **Add-ons** and configure the **ESAM Acquisition Point ID** after **Video Insertion** is enabled.

Customizing Scheduler360 endpoint configurations

To configure global settings for a Scheduler360 connection, do the following:

1. From the **Configure Channels** app, click **Settings**.
2. Click the **Advanced** tab.
3. Scroll down to the Scheduler360 area.
4. Make sure that the **Scheduler360 Endpoint** and **Auth Server** information is populated and the content is correct.
5. Enter your **Client ID** and **Client Secret**.
6. Click **Save**.

Activating a service

When you activate a service, it can receive, transcode, and output video.

Before activating a service, Harmonic recommends that you verify the service configuration.

Tip

You can quickly determine if the service is configured correctly by looking at its name. By default, each service name is a string consisting of the components that make up the service: source name, profile name, and destination name.

Service name string

Newtrain-Multiscreens Silver SD-NewTestDest



Note

Connectivity to the Harmonic Hub is required in order to activate a service.

1. Verify the source input as follows:
 - a. From **Configure Channels > Sources**, select the source you want to verify and then do the following:
 - In the **CloudLink** section, verify that the name of the CloudLink associated with the source is correct.
 - In the **IP Address** field, verify that the multicast IP address for the source is correct.
 - In the **Port** field, verify that the multicast port number used by the source is correct.
 - b. Click the **Play Video** button, verify that the video plays in the video player, and then close the video player.
 - c. Click **Close** to exit the **Edit Source** pane.
 2. Verify the service destination as follows:
 - a. From the **Destinations** page, click the name of the destination you want to verify.
 - b. In the **Files Output** section, click **Internal** and then verify that the **Publish Name** is correct.
 - c. Click **Close** to exit the **Edit Destination** pane.
 3. From the **Services** page, click the name of the service you want to verify, and then do the following:
 - In the **Source** area, verify that **Primary** is selected and the source name is correct.
 - In the **Destination** area, verify that the destination name is correct.
 4. If all settings are correct, click **Online** and then **Save**.
 5. Click **Commit changes**.
- Result:** The service begins receiving, transcoding, and outputting video.

Deactivating a service

Deactivate a service when you wish to set the service offline.

1. From **Configure Channels > Services**, click the name of the service you wish to deactivate.
Result: The **Edit services** pane appears.
2. Click **Offline**, and then click **Save**.
3. On the **Services** page, click **Commit changes**.

About service states

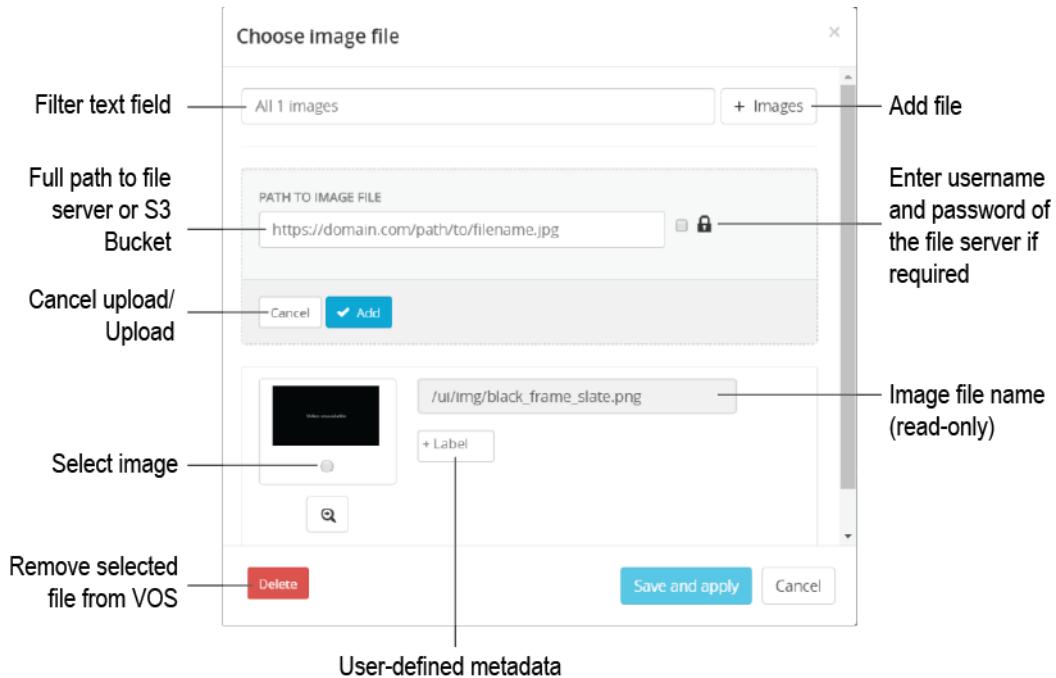
A service can be in one of three states: offline, online, or test.

Offline	The service is inactive.
Online	The service is receiving, transcoding, and outputting video.
Test	The service is receiving and transcoding video, but is not outputting video.

Uploading image files

You can upload channel logo and blackout slate image files when you configure services in the Configure Channels app. You can also upload image files using the Public API app.

Choose image file dialog



- To upload a slate image file, do one of the following:
 - Navigate to the Configure Channels app and create a new source. A backup signal loss source is added by default. Click the **Edit** icon to open the **Choose image file** dialog and upload the desired image file.
 - Navigate to the **Public API**, click POST /configure/v1/images, supply the necessary parameters and click **Try it out!**.

Info

The following REST API can be used to configure a source: POST /configure/v1/sources. Specify the image UUID for the imageID parameter to configure a slate image.

- To upload a logo image file, do one of the following:
 - Navigate to the Configure Channels app. If necessary, create the service source and destination, and then configure the service. On the **Commit** tab, select **Add-ons** and enable the **Logo** add-on. Click the **Edit** icon to open the **Choose image file** dialog and upload the desired file.
 - Navigate to the **Public API**, click POST /configure/v1/images, supply the necessary parameters and click **Try it out!**.

Info

The following REST API can be used to configure a service: POST /configure/v1/services. Specify the image UUID for the imageID parameter to configure the channel logo.

Configuring identical services for geo-redundancy

To ensure that the source, destination, and service configuration are identical, Harmonic recommends configuring each on one VOS instance and then copying the JSON configuration to the second instance using the Developer API.

1+1 geo-redundancy is supported for OTT pull-packaging only. The supported formats are HLS, DASH and MSS.

1. Configure a packaging-only service with redundant MBTS input sources and SS output on one of the paired instances. Follow instructions in [Configuring a packaging-only service](#).
2. From the Developer API app, copy the configuration JSON and paste in a text editor such as Notepad++:
 - a. Execute the GET /configure/v1/sources call, and then copy the contents of the **Response Body**.
 - b. Execute the GET /configure/v1/destinations call, and then copy the contents of the **Response Body**.

Note the following:

- **destinationProfileId**: This ID varies according to whether the VOS Cloud-Native Software is connected to the Harmonic Hub. You may either update this parameter to match that which is stored in the Hub before copying the JSON to the second cluster, or you may copy the local destination profile configuration JSON to the second cluster for continuity.
- **publishName** (in the internal packaging section): If a publish name is configured, it will be used to generate the egress URL. Otherwise, the service ID will be used to generate the egress URL.

- c. Execute the GET /configure/v1/services call, and then copy the contents of the **Response Body**.
3. Log into the second paired VOS Cloud-Native Software.
4. Using the Developer API, add the source, destination, and service configuration JSON as follows:
 - a. Paste the response from GET /configure/v1/sources on the first paired instance to POST /configure/v1/sources on this instance.

 **Note**

You must update ipNetworkAddress to that of the current VOS host.

 **Note**

Ensure that the primary and backup input sources have the same ranking on both VOS instances.

b. Click **Try it out!**

5. Paste the response from GET /configure/v1/destinations on the first paired instance to POST /configure/v1/destinations on this instance, and then click **Try it out!**.

6. Paste the response from GET /configure/v1/services on the first paired instance to POST /configure/v1/services on this instance, and then click **Try it out!**.

Note the following:

- Ensure that the service name (name) is identical on both VOS instances.
- Ensure that either the **publishName** (if used) or the service ID is identical on both VOS instances.

7. Set each service to online.

8. Verify service output in the Monitor Channels app. The egress URLs from both paired instances (except for the IP/domain name) should be the same.

What to do next

For further verification, you may also do the following:

1. Perform a playback test on individual services in each VOS Cloud-Native Software.
2. Compare the SS manifest from both clusters to see how consistent they are. Timestamps of segments/fragments should be the same, although the last one can differ by one or two fragments.

Related information

[1+1 geo-redundancy \(VOS Origin\)](#)

[Pairing Origin servers for 1+1 geo-redundancy](#)

Manually switching input sources

If a service has a primary and alternate input source, you can manually switch between sources while the service is active.

Note that, if a signal loss occurs and the service is in redundancy mode, the failover will occur within one second. If redundancy mode is not activated, the failover process could take up to 20 seconds.

1. From **Monitor Channels > Services**, click the name of the desired service.
Result: The service visualization graph appears.
2. On the **Ingest** panel, click the **Alt Source** icon to reveal the **Manual Override** icon.
3. Click the **Manual Override** icon to display the **Switch Service to Alt Source** dialog box, and then click **Switch**.
4. On the **Ingest** panel, verify that the checkmark now appears next to the alternate source.
5. Optionally, verify the video output by clicking the **Watch Output Video** icon in the **Origin** panel.
6. When you are ready, return to the primary input source by clicking the **Primary Source** icon on the **Ingest** panel, and then repeat the steps above.
7. Verify that the checkmark now appears next to the primary source.

Scrambling and encrypting services

VOS supports scrambling and encrypting services to protect media content from being illegally accessed and copied.

- [Adding an external CAS](#)
- [Adding a DRM system](#)
- [Enabling/Disabling CMAF encryption without restarting service](#)

Adding an external CAS

You can integrate an external CAS in the Scrambling app and then assign it to IPTV services in the Configure Channels app.

The external CAS must use a standard DVB-CSA or AES algorithm, including external or internal EIS, and external ECMG and EMMG.

Harmonic also supports scrambling IPTV services without the use of an external CAS.

1. From the Scrambling app, select **CAS > CA Systems**, and click **+ System**.
2. Configure the following settings:

CAS Name	Type the name of the CAS.
Super CAS ID	Type the Super CAS ID string, which is composed of the two-byte CA system ID followed by the two-byte CA subsystem ID.

3. Configure the **IP Address** and **Port** of the primary ECMG.
4. Select **CAS > SCG**, and click **+ SCG**.
5. Configure the settings for the access criteria:

SCG Name	Set the name of the SCG.
Name	(Optional) Enter a label for the ECM ID.
ECM ID	Enter the Entitlement Control Message (ECM) provided by the CAS.
CA System	Select the created CA System.
Access Criteria	Set the access criteria. The access criteria should be a valid HEX with an even number of digits.

6. Optionally, click **+ECM** to repeat the previous step for each set of access criteria.
7. Optionally, add a backup **SCG**.
8. Click **Save**.

Result

You can assign the CAS to an IPTV service when you configure the service in the Configure Channels app.

Adding a DRM system

You can configure digital rights management (DRM) systems in the Scrambling app and assign them to OTT services in the Configure Channels app.

In order to have different keys for each service, unique ResourceIDs are recommended per service. Appending a suffix to the end of a common Resource ID would allow the KMS to better differentiate between multiple package formats within the same service and return the relevant DRM metadata. For example: Harmonic_HLS, Harmonic_SSKR, Harmonic_DASH.

⚠ Note

Ensure that you specify the **Encryption Method** in the destination profile for each service that will use the DRM system.

1. From the **Scrambling** app, navigate to the **DRM** tab, click **Systems > Add System**.
2. Configure the following settings:

DRM System Name	The name of the configured DRM system.
Encryption Interface	<p>This is the protocol used to interface with the DRM server.</p> <p>⚠ Note</p> <p>For Harmonic KMS (HKMS) API, using the minimum implementation is recommended. While the full implementation provides the benefit of an additional key session layer for redundancy and horizontal scaling, there may already be pre-existing redundancy/scaling methods within the DRM implementation, making the minimum implementation a simpler, better approach.</p>
Requestor ID	ID of the transcoder or scrambler requesting the key session. The requestor ID must be unique among all devices that connect to the same DRM system. If it is not provided, then a random UUID is used.
CENC Setting	Configure the DRM systems that are used for CENC encryption in HLS, DASH or CMAF. Applicable only to CPIX based KMS API types.

3. To add a Resource ID, click in the **Resources** field.

- a. In the **DRM Resources** dialog, configure the following settings:

Packaging Type	Choose the targeted packaging (HLS, DASH, MSS, CMAF).
Name	Enter the name of the configured DRM resource.

Resource ID	ID of the asset/live channel (a.k.a Content ID) that is to be encrypted. Maximum 128 characters. If it is not provided, then a random UUID is used.
-------------	---

- b. Click **Save**.
- c. Repeat this step for each Resource ID you wish to add.

4. Click **+Key Management Server** to add a primary KMS server, and then enter the **KMS URL**.
5. Optionally, add a backup KMS server in addition to the primary KMS server,
6. Click **Save**.

Result

You can assign the DRM system to an OTT service when you configure service add-ons in the Configure Channels app.

Related information

[Configuring service add-ons](#)

Supported encryption methods

Review which DRM systems are supported by each OTT output format.

ABR format	Supported Encryption mode	Encryption/DRM system
HLS-sTS	AES-128 CBC (MPEG-CENC 'cbc' protection scheme)	AES Encryption (Native)
		Sample AES Encryption (Native)
		Apple FairPlay
	AES-128 CTR (MPEG-CENC 'cenc' protection scheme)	Common Encryption
		AuthenTec PlayReady
		Discretix PlayReady*
		Irdeto PlayReady
		Secure Media
HLS-fMP4	AES-128 CBC (MPEG-CENC 'cbc' protection scheme)	AES Encryption (Native)

ABR format	Supported Encryption mode	Encryption/DRM system
		Sample AES Encryption (Native)
		Apple FairPlay
	MPEG-CENC 'cbc' protection scheme = AES-128 CBC mode, with partial encryption OR MPEG-CENC 'cenc' protection scheme = AES-128 CTR mode, with full encryption	Common Encryption (PlayReady, Widevine, Marlin...)
MSS	AES-128 CTR (MPEG-CENC 'cenc' protection scheme)	PlayReady
MPEG-DASH	MPEG-CENC 'cenc' protection scheme= AES-128 CTR mode with full encryption	Common Encryption (MPEG- CENC) (PlayReady, Widevine, Marlin...)
CMAF DASH	MPEG-CENC 'cbc' protection scheme = AES-128 CBC mode, with partial encryption OR MPEG-CENC 'cenc' protection scheme = AES-128 CTR mode, with full encryption	Common Encryption (MPEG- CENC) (PlayReady, Widevine, Marlin...)
CMAF HLS		Common Encryption (MPEG- CENC) (Apple FairPlay, PlayReady, Widevine, Marlin...)

*Key rotation is not supported due to format-specific limitation.

DRM system integration

Harmonic defines its own API for integrating third-party DRM systems with VOS. The Widevine KMS API is also supported.

The Harmonic KMS interface is an XML/SOAP-based interface designed to facilitate encryption key and DRM metadata exchange between an OTT packager/scrambler (VOS) and a third-party KMS.

Please check that the DRM system you intend to use is fully compliant with the Harmonic KMI (Key Management Interface) Full or Minimum specification before connecting this DRM system to VOS.

Configuring DRM using Internal KMS

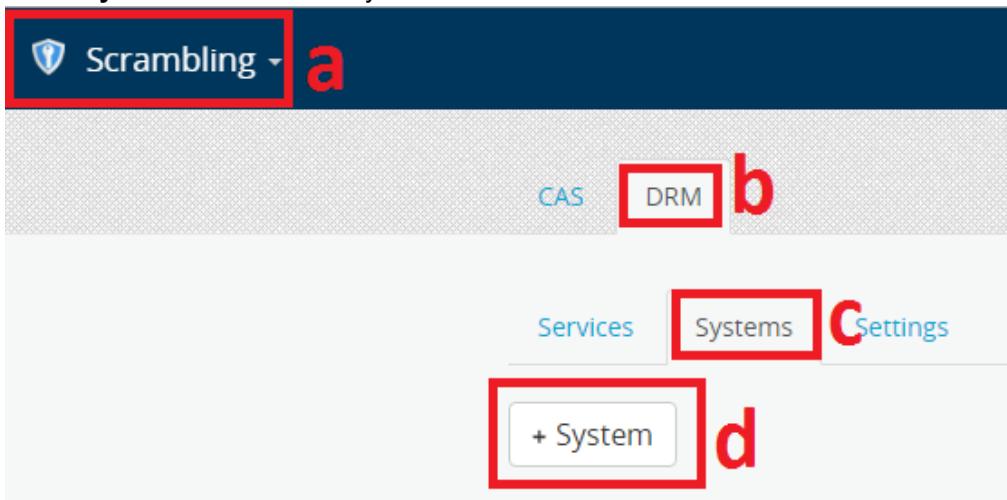
You can use the Internal KMS app to configure the DRM system for OTT services.

Prerequisites

- Internal KMS app works **only on K8s setup**.
- Support HLS AES encryption, Harmonic KMI Minimum interface.
- Ports 20214 (http) and 20213 (https) are used for Internal KMS access.

Configuring DRM using Internal KMS

1. Navigate to **DevOps > Developer API** to pre-setup Internal KMS app (REST /internal-kms/v1/)
 - a. **/internal-kms/v1/settings:**
 - endPoint - prefix value for key, that will be inserted into playlist. By default use load balancer IP value, leave empty if you want so. Don't forget to put http(s):// into this parameter.
 - seed - value, that is used in key generation.
 - b. **/internal-kms/v1/client-certificate:**
Use this REST for adding client certificate. Set empty value if you desire not to use client certificate.
 - clientTrustedCertificates - chain of client certificates, for adding new one, paste it into end of GET request. Must contain not only last client certificate, but also certificate that sign this one (all chain).
2. Configure the DRM system:
 - a. Navigate to the **Scrambling** app.
 - b. Select the **DRM** tab.
 - c. Select the **Systems** tab.
 - d. Click **+System** to create new system.



e. Configure DRM system settings:

- i. **DRM System Name**
- ii. **Encryption Interface** - select the "Harmonic KMI Minimum".
- iii. **Requestor ID**
- iv. Click the **Resources** button to add resources.

Internal KMS works with HLS AES encryption.

⚠ Important

Set up one resource per each service output.

Use the destination profile which is correctly set up for encryption.

v. **KMS URL** - Key Management Server - link to Internal KMS service (<http://internal-kms:20214/ws>)

The screenshot shows the configuration page for the Internal KMS DRM. The 'KMS URL' field is highlighted with a red box and contains the value 'http://internal-kms:20214/ws'. Other fields highlighted with red boxes include 'DRM SYSTEM NAME' (Internal KMS DRM), 'REQUESTOR ID' (test-requestor-id), and 'RESOURCES' (checkbox). The 'Key Management Servers' section shows 'Primary' selected. The 'HTTPS CERTIFICATE VALIDATION' section has 'OFF' selected. Buttons at the bottom include 'Delete', 'Save' (highlighted with a red box), and 'Close'.

3. Configure a [multiscreen/origin service](#) using the DRM system for Internal KMS:

- a. Enable the service [Add-ons](#) with DRM enabled for setting the DRM system.

The screenshot shows the configuration page for a multiscreen/origin service. The 'DRM' switch is turned 'ON'. Below it, the 'DRM SYSTEMS & CONFIGURATIONS' section displays the following information:
NAME: HLS_IKMS_SD
DRM SYSTEM: Internal KMS DRM
RESOURCE: HLS

Result: The service is running with Internal KMS generated keys.

Configuring DRM using Apple CPIX

You can configure a service with the Apple FairPlay encryption using the Apple CPIX Interface.

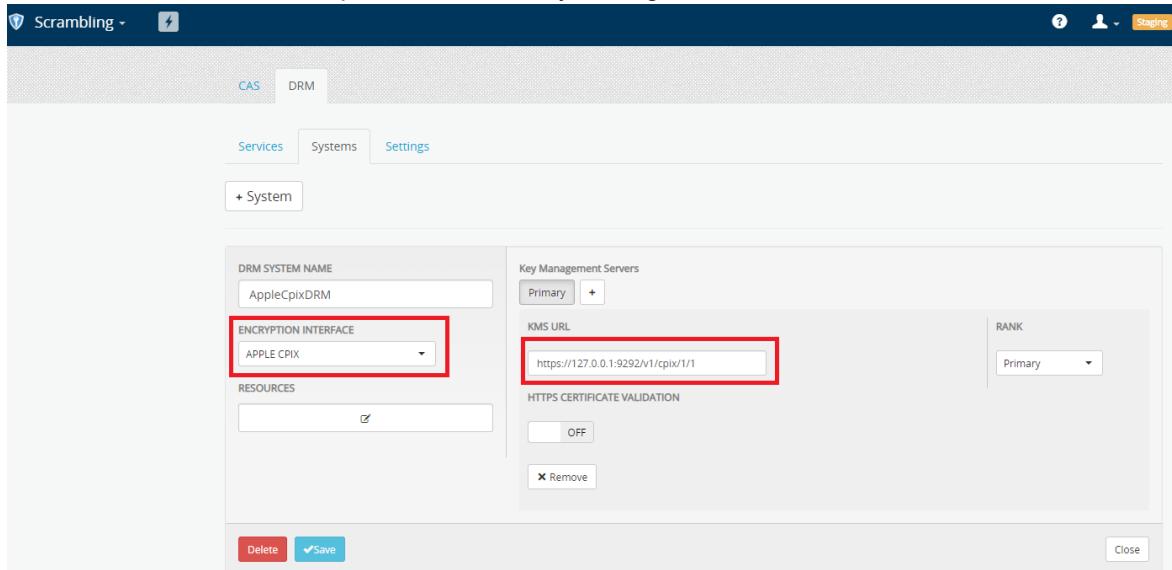
1. Navigate to the **Scrambling** app > **DRM** tab > **System** tab.
2. Click **+System** to create new system.
3. Configure DRM system settings:
 - a. **DRM System Name**
 - b. **Encryption Interface**: Select the "Apple CPIX".
 - c. Click the **Resources** button to add resources and select the "HLS" Packaging Type.

⚠ Important

Set up one resource per each service output.

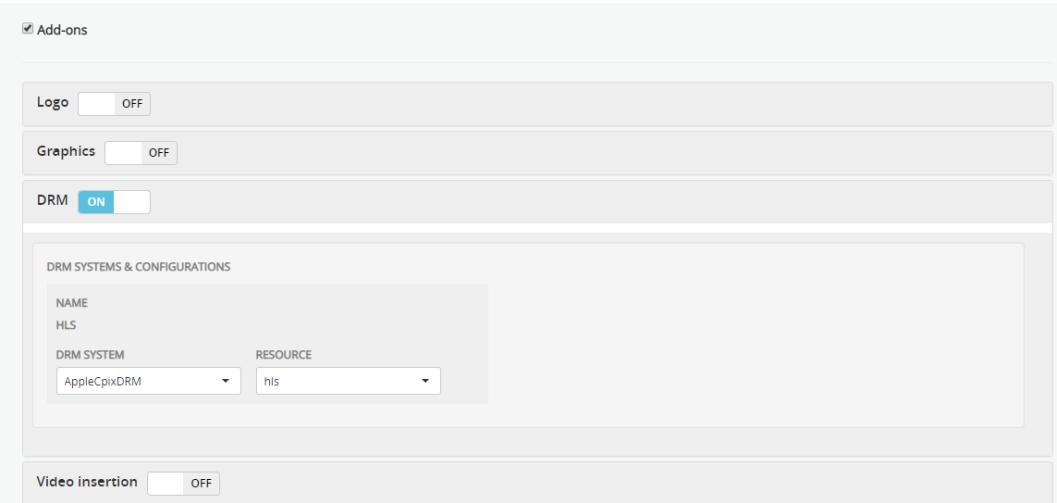
Use the destination profile which is correctly set up for encryption.

- d. **KMS URL**: Use the HTTPS protocol for the Key Management Server URL.



4. Use a destination profile with HLS Package selected and Encryption Method configured as "FairPlay".

- Start a service with the DRM add-on enabled and appropriate DRM settings configured.



Configuring DRM using Harmonic CPIX

You can configure a service with encryption using the "Harmonic CPIX" KMS API for live, start-over, catch-up, long lasting catch-up (LLCU) and VOD services.

1. Navigate to the **Scrambling** app > **DRM** tab > **System** tab.

2. Click **+System** to create a new DRM system.

DRM SYSTEM NAME e.g., DRM-1	Key Management Servers Primary <input style="margin-left: 10px;" type="button" value="+"/>
ENCRYPTION INTERFACE Harmonic CPIX	KMS URL e.g. https://server:10001/node
CUSTOM HEADER	RANK Primary
CENC SETTING	
RESOURCES	
HTTPS CERTIFICATE VALIDATION <input style="margin-left: 10px;" type="button" value="OFF"/>	
HTTP METHOD <input style="margin-left: 10px;" type="button" value="POST"/>	
CPIX DOCUMENT VERSION <input style="margin-left: 10px;" type="button" value="2.3"/>	
SIGN KEY REQUESTS <input style="margin-left: 10px;" type="button" value="OFF"/>	VALIDATE KEY RESPONSES SIGNATURE <input style="margin-left: 10px;" type="button" value="OFF"/>

3. Configure the DRM system settings:

- DRM System Name**
- Encryption Interface:** Select the "Harmonic CPIX".
- Custom Header (Option):** Configure a custom HTTP header (header name + value) that will be added to the CPIX key requests sent to the KMS (It can be used for instance for providing an authentication token to the KMS).

- d. **CENC Setting:** Configure the DRM systems that are used for CENC encryption in HLS, DASH or CMAF. (*The selected DRM systems will be converted into the corresponding 'DRMSystem@systemId' in the CPIX key requests.*)

Packaging Type	DRMs
HLS	<input type="checkbox"/> Microsoft PlayReady <input type="checkbox"/> Google Widevine <input checked="" type="checkbox"/> Apple FairPlay <input checked="" type="checkbox"/> Marlin
DASH	<input checked="" type="checkbox"/> Microsoft PlayReady <input checked="" type="checkbox"/> Google Widevine <input type="checkbox"/> Marlin
CMAF HLS	<input type="checkbox"/> Microsoft PlayReady <input type="checkbox"/> Google Widevine <input type="checkbox"/> Apple FairPlay <input type="checkbox"/> Marlin
CMAF DASH	<input type="checkbox"/> Microsoft PlayReady <input type="checkbox"/> Google Widevine <input type="checkbox"/> Marlin

Note

DRM type for HSS/MSS cannot be configured, as PlayReady is the only DRM format supported for Smooth-Streaming packaging type.

- e. Click the **Add Resource** button to add resources.

Resource ID: The "Resource ID" values correspond to the Content Identifiers (CPIX@contentId) that are included in the CPIX key requests.

DRM Track Filter: For HLS/DASH packaging types, different encryption keys can be created for different track types based on the DRM Track Filtering Profiles defined from **Lab Wizard** app > **OTT Filters** (Refer to [Configuring multi-key encryption and OTT track filters \(DRM track filters\)](#) for details).

DRM Resources

Packaging Type	Name	Content ID / Resource ID	DRM Track Filter
HLS	hls-fmp4	hls_fmp4_resource_id	Filtering Profile ▾ <input type="button" value="X"/>
HLS	hls-ts	hls_ts_resource_id	Filtering Profile ▾ <input type="button" value="X"/>
DASH	dash	dash_resource_id	Filtering Profile ▾ <input type="button" value="X"/>

- f. **KMS URL:** Enter the URL of the CPIX compliant endpoint offered by the Key Management Server for key request. It is recommended to use only HTTPS protocol for production systems.

Note

To use HTTP basic authentication, the credentials must be included in the URL by prepending "*username:password@*" to the hostname (e.g. <https://username:password@kmsHostname/cpixEndPoint>).

- g. **HTTPS Certificate Validation:** If activated, VOS will validate that the certificate used by the KMS is valid (i.e. it authenticates the remote server) before completing the HTTPS connection establishment.

Note

Before using this feature, the publicly trusted certificate of the KMS must first have been uploaded to VOS using the REST API.

It is expected that the KMS server will perform the same validation using the public VOS trusted certificate (you must have uploaded the corresponding private certificate in VOS), so that both parties can trust each other. This is what is usually called HTTPS mutual authentication.

- h. **HTTP Method:** It allows selecting the way you want the key request to be done. The usual and recommended setting is "POST".

- i. When selecting HTTP POST, for each key request VOS sends a CPIX document to the KMS, this document including all the parameters (contentId, requested DRM format, key period, etc.) is needed by the KMS to process the request.
- ii. When selecting HTTP GET, for each key request VOS sends no CPIX document to the KMS, but sends only the "content identifier"(contentId) directly in the key request KML URL.

- The following template must be used in KMS URL field when using "HTTP GET":
<https://hostname/path/{contentId}?staticParameter=staticValue> (e.g. <https://KmsHostname/configuration/df23-add2-hghh-e453?keyIdFormat=UUID>).
 - For each key request, {contentId} is replaced automatically by the "Resource ID" configured in the "DRM Resources" section and that has been associated to the specific content (live service, VoD asset, etc.)
- i. **CPIX Document Version:** Select the version for the CPIX document that is supported for the DRM encryption with the Harmonic CPIX KMS. The supported versions are 2.2 (no explicit 'version' in the CPIX documents) and 2.3 (explicit 'version' and use of 'ContentKey@commonEncryptionScheme' in the CPIX documents).
- j. **Sign Key Requests:** It forces VOS to sign the CPIX document that is included in the key request.

⚠ Note

Before using this feature, you must first upload a private certificate in VOS and have the corresponding public certificate configured in the KMS, so that the KMS can validate the digital signature. When uploading the CPIX private certificate in VOS, the "Sign Key Requests" option is automatically activated (you can then deactivate it manually).

- k. **Validate Key Responses Signature:** It forces VOS to check that the key response CPIX document received from the KMS is signed and to validate the digital signature.

⚠ Note

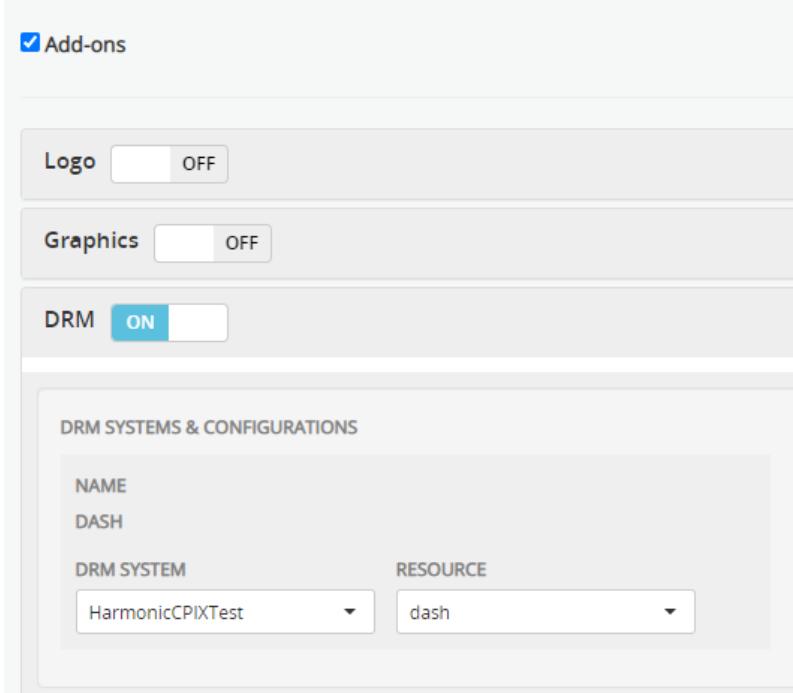
Before using this feature, you must first upload the public certificate of the KMS to VOS. When uploading the KMS public certificate to VOS, the "Validate Key Responses Signature" option is automatically activated (you can then deactivate it manually).

4. Configure the corresponding destination profile to use the appropriate encryption method according to the table below:

Packag e type	DRM System to select in the Scrambling app	Encryption method (in the destination profile)	Additional parameters in the destination profile
DASH	PlayReady	Common Encryption	
CMAF- DASH	Widevine		
	Marlin		
HLS TS	Fairplay	Fairplay	

HLS fMP4	Fairplay	Common Encryption	Set "Package in fMP4" to True for HLS
	PlayReady		
	Widevine		
	Marlin		
MSS	PlayReady	PlayReady	

5. During creation of the service enable **Add-ons**. Turn on **DRM** and choose resources from your DRM system for corresponding OTT packaging outputs.



Enabling/Disabling CMAF encryption without restarting service

You can enable/disable encryption for live CMAF packaging (i.e. unified CMAF packaging with CMAF HLS and CMAF DASH) while service is running and without restart of the service.

Prerequisites

Configure a service with:

- Origin destination defined with the destination profile having CMAF packaging profile.

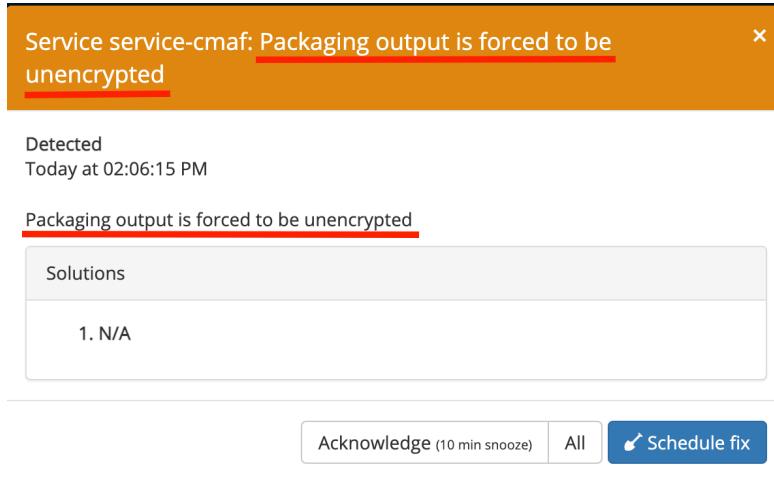
- DRM Add-ons turned on.

1. Navigate to the **Public API** app.
2. Under **Monitor Service**, navigate to **POST/monitor/v1/services/{id}/toggle_drm**.

Name	Description
id * required string (path)	id id - id
toggleDrmState * required (body)	toggleDrmState Edit Value Model <pre>com.harmonicinc.vos.app.monitor.model.ToggleDrmState { drmControlState* string Control state of DRM. DEFAULT means to follow existing DRM configuration. FORCE_UNENCRYPTED means to disable DRM for packaging (only support for CMAF packaging profile) Enum: <-- { DEFAULT, FORCE_UNENCRYPTED } timeToProcessChangeInUtc* string(\$date-time) Time (in UTC) to enable/disable DRM, represented in format of yyyy-MM-ddThh:mm:ssZ (e.g. 2021-03-04T12:34:56Z) }</pre>

3. Use the HTTP POST method to specify time to enable/disable encryption.
 - a. Query parameter:
 - **id** - service ID
 - b. Request body parameters:
 - **drmControlState** - enable/disable the encryption for packaging (currently only for CMAF packaging).
 - Available options are:
 - DEFAULT (i.e. following existing DRM configuration of service)
 - FORCE_UNENCRYPTED
 - **timeToProcessChangeInUtc** - specify time to enable/disable encryption.
Value must be:
 - UTC represented in format of YYYY-MM-DDTHH:mm:ssZ
(e.g. 2021-03-04T12:34:56Z)
 - >= 4 seconds from current time.

4. From the VOS notification, verify the warnings indicating packaging output is forced to be unencrypted.



5. From the **Monitor Channels** app, verify the warnings indicating output is forced to be encrypted.



Result: Users who have started playing back encrypted CMAF HLS (or CMAF DASH) content earlier remain unaffected. Other new users start playing back with unencrypted CMAF HLS (or CMAF DASH) output.

About Origin/CDN destinations

With this type of service destination, content is initially saved to the Origin server, and then replicated to edge servers that make up the Content Delivery Network (CDN).

Supported delivery modes

Push Packaging	In this mode, all of the profiles are packaged in all the configured formats and pushed to a publishing point on a periodic schedule using a data transfer protocol (WebDAV, HTTP POST). The OTT data will be served from the publishing point, otherwise known as the origin server.
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Pull Packaging	In this mode, only the profiles and formats requested by downstream devices are sent. Downstream devices can include the Origin shield cache server, parent cache server, players, etc. Data is transferred using the standard HTTP GET protocol. The VOS system functions as the origin server.
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Origin server performance and access requests can be monitored by using the Origin app.

Note

Origin server supports 2 public and private TLS certificates for HLS key files pull delivery to different CDNs using HTTPS.

Supported package types

VOS supports several package types for your Origin/CDN destination profiles.

Different package types contain specific kinds of properties that you set to work with your services for various kinds of output. VOS supports the following package types:

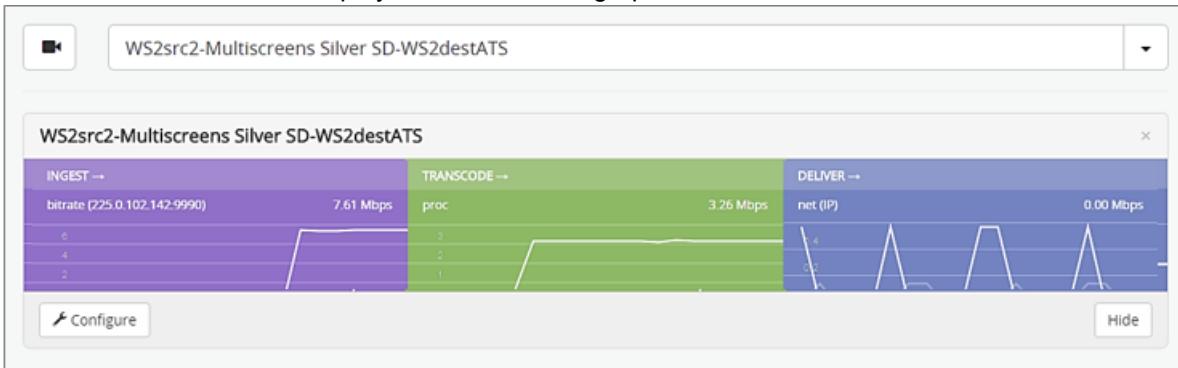
- Dynamic Adaptive Streaming over HTTP (DASH), also known as MPEG-DASH.
- HTTP Live Streaming (HLS). Developed and released by Apple.
- Microsoft Smooth Streaming (MSS). Developed and released by Microsoft. Requires Microsoft IIS Media Services.
- Raw Transport Stream (Raw TS). Unmodified video stream.
- Real Time Messaging Protocol (RTMP). Developed by Adobe/Macromedia.
 - Including the support of RTMPS (secured RTMP over a TLS/SSL connection).

Monitoring a transport stream

Use the Monitor Channels app to monitor the transport stream after activating the service.

1. From **Monitor Channels > Services**, verify that a small graph appears to the right of the service that you recently activated.
The small graph indicates that the service is active.

2. Click the active service to display the visualization graph.



3. On the **Ingest** panel, verify the service bitrate and IP socket.
4. On the **Transcode** panel, verify the processing bitrate.
5. On the **Deliver** panel, verify the video output bitrate.

⚠ Note

If the video output bitrate is 0, then the service is not being delivered.

6. To monitor a different video output bitrate for an ATS service, do the following:
 - a. Click the title bar of the **Deliver** panel to expand the visualization graph.
 - b. From the **CloudLink** list, select a different IP socket.
Each IP socket corresponds to a different bitrate.

Result: The new bitrate is displayed in the **Deliver** panel.

Managing media assets

VOS supports both automatic and manual ingest and transcoding of file-based assets using the Asset Acquisition app. Only Super Admins have access to the Asset Acquisition app.

⚠ Important

Harmonic strongly recommends that you delete file-based assets that are no longer needed in order to free up system resources.

⚠ Note

By default, the maximum number of concurrent transcoding jobs is three. If your workflow requires that more than three jobs be processed concurrently, contact Harmonic technical support for assistance.

Asset Acquisition app overview

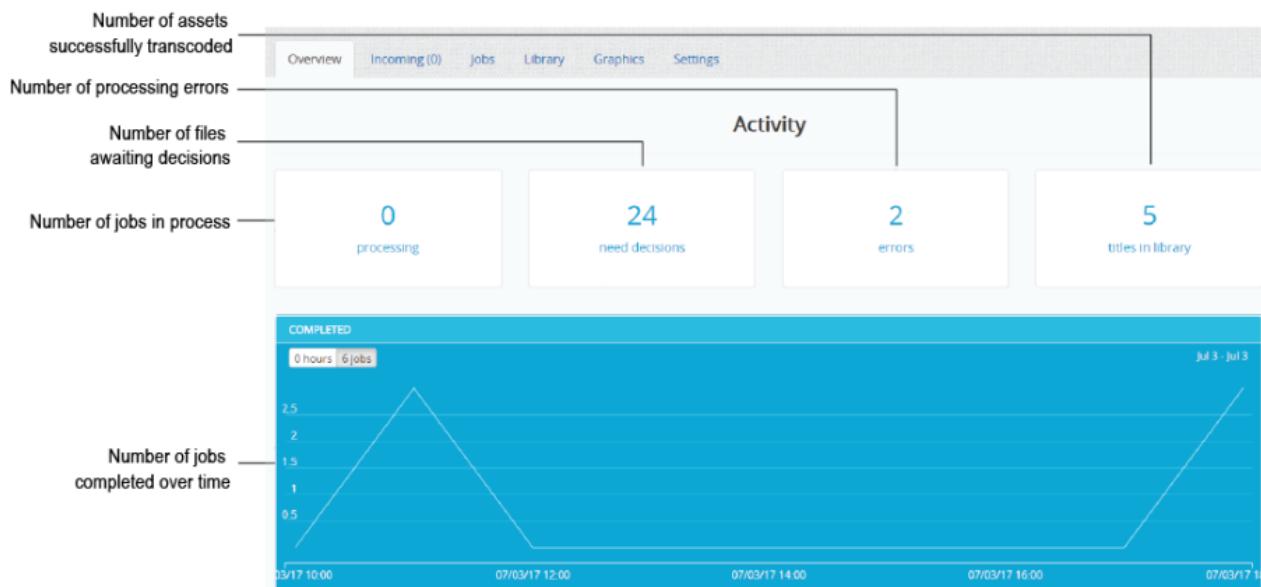
Review the app layout and function of each element in the user interface.

- [Overview page](#)
- [Incoming page](#)
- [Jobs page](#)
- [Library page](#)
- [Graphics page](#)
- [Settings page](#)

Overview page

The **Overview** page provides a summary of all activities in the Asset Acquisition app.

[Asset Acquisition Overview page](#)



Incoming page

From the **Incoming** page, you can upload files, capture assets, create jobs, and view jobs that await processing.

Asset Acquisition Upload assets page

The screenshot shows the "Upload files using Web upload widget" section. It includes:

- S3 Bucket connection details:** An icon of a person, "S3 BUCKET ADDRESS: asset-acquisition-hkv-white-001s000000gsrviao.s3-us-west-2.amazonaws.com", "S3 ACCESS KEY", "REGION: us-west-2", and "AWS SECRET ACCESS KEY".
- WEB UPLOADER:** A file selection interface with a list of files:
 - 0029_GlassRings.ts
 - ClipMXF_tsEM4000.mxf already exists!
 - SwedishFairytales_3600_720p_H264.ts already exists!
 Buttons include "Select files" and "or drag and drop from your desktop".

Note

Your S3 Bucket access credentials for your VOS account are located here.

Channels

The screenshot shows the 'Asset Acquisition' interface with the 'Channels' tab selected. At the top, there are navigation links: 'Upload', 'Channels' (which is active), 'Decision Queue', and 'Ready Queue'. Below the navigation, a message says 'Capture assets from your channels.' A search bar labeled 'Search channels' is present.

1—Select a channel

Setup playout channels in [Configure](#). Make sure to provide retention period in the corresponding destination profile.

A list of channels is shown:

- Harmonic HVN 2 Sample (1h Time shift)
- Harmonic NASA Sample (1h Time shift)

2—Choose time segment

Preload segment and fine-tune in/out points with video editor below.

07/01/2020 9:20 am - 07/01/2020 9:33 am 10:07 am [Preview](#)

The preview window shows a green lizard with the 'HVN 2' and 'VOS 360' logos. Below the preview are the capture controls:

IN 00:00:00 Set OUT 00:12:58 Set Capture

Recorded assets appear in [Library](#) as Harmonic HVN 2 Sample.

You can capture assets from your channels here.

1. Select the channel you want to capture the asset from.
2. Use the slider to select the time segment and click **Preview**.
The **In** and **Out** values appear, relative to the time selected in the slider bar. You can fine-tune these values, if needed.
3. Click **Capture** to capture the asset.

Info

Recorded assets are saved to your Library.

Decision Queue

Automatically and manually uploaded files awaiting decisions

The screenshot shows the 'Decision Queue' tab selected in the top navigation bar. Below it, a sub-navigation bar includes 'Upload', 'Channels', 'Decision Queue' (which is active), and 'Ready Queue'. A search bar labeled 'Search by title' is present. The main area displays a list of files under the heading '1— Select files'. Each file entry includes a thumbnail, name, size, and duration. To the right of this list are several configuration sections:

- 2— Apply decisions**: Includes 'PRIORITY' (Rush, Normal, Backlog) and 'PROFILE(S)' (MBTS Test Passthrough, Multicams Gold HD, Multicams Gold SD).
- Priority level determines job position in Ready Queue**
- Transcoding profiles to be applied to uploaded files**
- PROCESS FILE TYPES**: Shows 'MXF' selected.
- Select file types for grooming**
- GROOM WITH PROFILE**: Shows 'Nothing selected'.
- Select grooming profile**

At the bottom of the main area are buttons for 'Reset', 'Delete selected', and 'Apply to selected'.

Info

When you select multiple source files or apply multiple profiles to source files, one job is created for each source file and profile combination.

Note

You may also use the following Public Rest API to get a full list of files in addition to "Search by title" above.

Get /asset-acquisition/v1/assets/need_decision

Ready Queue

The screenshot shows the 'Ready Queue' section of the Asset Acquisition interface. It includes a search bar for 'Search jobs by title' and tabs for 'Upload', 'Channels', 'Decision Queue', and 'Ready Queue'. A note states: 'Jobs will be processed within each queue on first-in basis as infrastructure resources become available.' Below are three sections:

- Jobs awaiting processing in rush queue.** (Rush section) - Currently no jobs in rush queue.
- Jobs awaiting processing in normal queue** (Normal section) - Shows three pending jobs: 0029_Gardening.ts, BBC_1.ts, and smokin_aces.ts.
- Jobs awaiting processing in backlog** (Backlog section) - Currently no jobs in backlog queue.

Info

Rush jobs start after any remaining in-progress jobs are completed.

Jobs page

The **Jobs** page provides details and status information for each job in progress.

Info

By default, the maximum number of concurrent jobs is three.

Asset Acquisition Jobs page

The screenshot shows the Asset Acquisition - Jobs interface. At the top, there are tabs for Overview, Incoming (0), Jobs, Library, Graphics, and Settings. The Jobs tab is selected. Below the tabs, it says "1 source file totaling 1 jobs". A search bar labeled "Filter jobs" and "Search by source filename" is present. An "Asset file name" section shows "0029_GlassRings.ts" with details: SUBMITTED Jul 3, 2017 5:42 PM EEST; PRIORITY Normal ETC 5:45 PM; FILE SIZE 4.0 MB DURATION 0:00:12; FORMAT MPEG-TS FRAME SIZE 1920x1080. To the right, under "Job status", it says "Transcoding profiles applied" and shows three profiles: MDT TEST PASTTHROUGH, MULTISCREEN GOLD SD, and MULTISCREEN GOLD HD. The "MULTISCREEN GOLD SD" profile is highlighted with a blue bar indicating it is in progress. A "JOBS AND TASKS" section lists these three profiles with their status: Completed, In Progress, and Completed respectively. A "View in Library" button is located below this section. At the bottom left, there are "Cancel job" and "View transcoded asset in Library" buttons.

Library page

Video assets, including .ts, .mxf, .mov and .mp4 files, appear in the **Library** once transcoding or grooming is complete.

i Info

File-based assets extracted from a Playout Channel also appear in the Asset Acquisition **Library**.

Removing an asset file from the library

Removing an asset file

You can remove an asset file from the library permanently by selecting the desired asset Titles above the thumbnail.

1. Select the Title checkbox above the thumbnail for the asset.

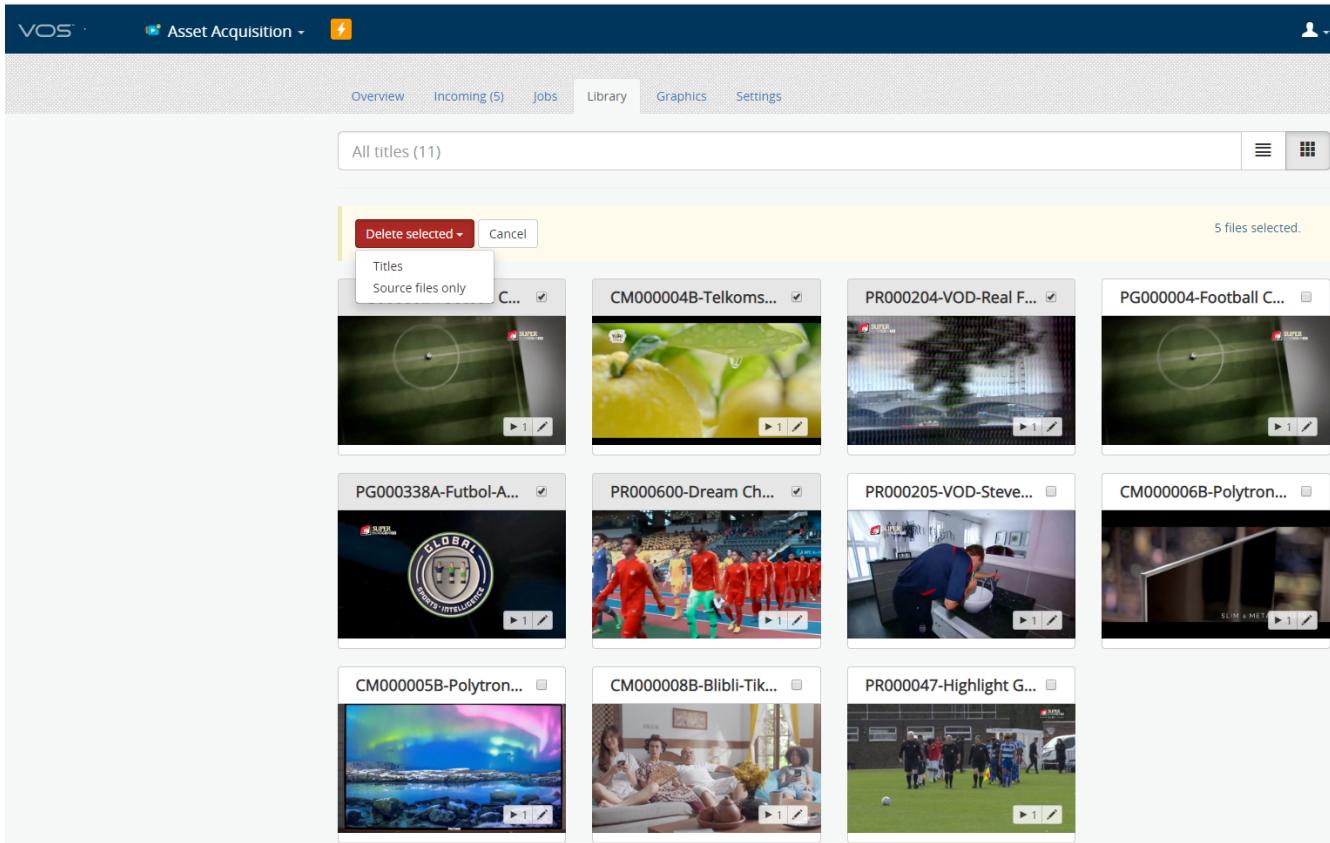
⚠ Note

Assets may not have thumbnails by default. You can upload desired thumbnails to the assets by clicking on the thumbnail preview.

2. Select **Titles** from the **Delete selected** drop-down list.

- Click **Delete** to confirm. The entire Asset is deleted, including info, transcoded files, and source files, if any.

Asset Acquisition Library page



Deleting a source file

You can delete a source file only from the library by selecting the desired asset titles above the thumbnail.

- Select the Title checkbox above the thumbnail for the asset.

⚠ Note

Assets may not have thumbnails by default. You can upload desired thumbnails to the assets by clicking on the thumbnail preview.

- Select **Source files only** from the **Delete selected** drop-down list.
- Click **Delete** to confirm.

Graphics page

The **Graphics** page displays all logo and graphic template files that have been uploaded using the Web Uploader in **Incoming** from the **Asset Acquisition** app.

ⓘ Info

Logo and graphic template assets are not transcoded.

Asset Acquisition Graphics page

Thumbnail/List view

Filter graphic templates by title

All graphics (7)

72px-TV-14_icon.png

No thumbnail available

72px-TV-G_icon.png

No thumbnail available

72px-TV-MA_icon.png

No thumbnail available

72px-TV-PG_icon.png

No thumbnail available

Select for deletion

72px-TV-Y_icon.png

No thumbnail available

72px-TV-Y7_icon.png

No thumbnail available

HarmonicLogo2.png

No thumbnail available

Settings page

From the **Settings** page, you can opt to delete source files after processing, enable automatic transcoding, and configure audio grooming profiles.

Asset Acquisition Settings page

Overview Incoming (0) Jobs Library Graphics Settings

General Profiles Logo Templates Social Media

KEEP SOURCE FILES
 On

DECISION DEFAULTS
 On

PRIORITY
 Rush Normal Backlog

PROFILE(S)
Add profile

GROOM MXF WITH PROFILE
MXF-1-Audio

GROOM MOV WITH PROFILE
MOV-1-Audio

GROOM MP4 WITH PROFILE
MP4-1-Audio

GROOM TS WITH PROFILE
TS-1-Audio

VOD DESTINATION PROFILE
Select profile

ENABLE ENCRYPTION

+ go to Scrambling

ENABLE THUMBNAIL INDEXING FOR PACKAGING
 Off

APPLY LOGO TEMPLATE
 Off

Revert Save

Keep Source Files	De-select to delete source files from VOS storage upon job completion. Customers may wish to keep the source files in case re-transcoding is needed later without re-ingesting.
Decision Defaults	Enable automatic transcoding of assets (from S3 bucket and local storage).
Priority	Select a priority level for automatic jobs.
Profile(s)	Add transcoding profile (only validated profiles are listed).
Groom MXF/MOV/TS/MP4 with Profile	Create audio/subtitle grooming profile for MXF/MOV/TS/MP4 files. <p>Note</p> <p>If the video asset is going to be used for playout channels or if there are any audio/subtitle PIDs from the VOD source file need to be changed or removed then the asset needs to have a initial Grooming stage.</p>
VOD Destination Profile	It is used for packaging all the VOD contents available from the Origin.
Enable Encryption	Enable this checkbox if the VOD contents are configured to use DRM by default and to set the global VOD encryption settings for each packaging format.
Enable Thumbnail Indexing for Packaging	Enable this checkbox if you want thumbnails to be indexed for every VOD asset automatically.
Apply Logo Template	Add logo to the VOD asset with desired graphic and logo settings.

Asset Acquisition Profiles page

Supported ingest file types

Asset Acquisition supports the following file types for video assets:

Transcoding workflow

General requirements:

- Sources must not contain continuity or truncation errors
- Sources should be at minimum longer than one IDR duration
- Sources should not have audio/video alignment issues
- Published frame rate should align with video encoding frame rate
- Fixed frame rate

Asset Acquisition supports the following container types for video assets:

- .ts
- .mxf
- .mp4
- .mov
- .mpg

For detailed specs, please reach out to your Harmonic account representative.

Passthrough workflow (pre-transcoded ABR) for HLS packaging

Note

Passthrough without transcoding is supported only for MBTS and MBMP4 transcoded by WFS

Logos and Graphics

Asset Acquisition supports the following file types for logos and graphic templates:

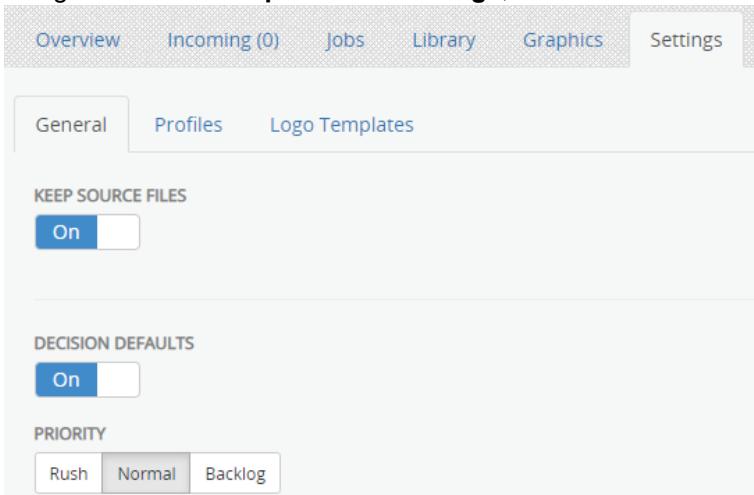
- .png (logo)
- .jpg (logo)
- .jpeg (logo)
- .bmp (logo)
- .tga (logo)
- .tif (logo)
- .swf (graphic template)
- .flv (graphic template)
- .webm (graphic template)
- .zip (html5)

Some file types can only be supported on Playout channels. For detailed specs, please reach out to your Harmonic account representative.

Configuring automatic transcoding

When configured, automatic transcoding will be performed on the source files as well as manually uploaded files.

1. Navigate to **Asset Acquisition > Settings**, turn on **Decision Defaults**.



2. Configure the following settings:

<p>Priority</p>	<p>Choose the default priority level for each transcoding job:</p> <ul style="list-style-type: none"> • Rush jobs are processed first. If any Normal jobs are currently processing, the Rush job will begin once the current job is complete. • Normal jobs are processed after Rush jobs. • Backlog jobs are processed last. <div style="border: 1px solid #f0e68c; padding: 10px; margin-top: 10px;"> <p>Note</p> <p>By default, a maximum of three jobs may be processed concurrently.</p> </div>
------------------------	---

3. Below **Profile(s)**, delete the profile that is added by default by clicking the **x** and select the appropriate transcoding profile from the drop-down menu if assets are to be used for OTT VOD delivery. If assets are to be used for channel origination playout only, leave **Profile(s)** empty.
4. (Optional) Below **Groom MXF with Profile / Groom MP4 with Profile / Groom TS with Profile**, if grooming is required, select the appropriate grooming profile from the drop-down menu that you have created through **Asset Acquisition > Settings > Profiles**.
5. (Optional) If grooming profile has not been created, click **Add in Profiles** under the relevant input source type(MXF/MP4/MOV/TS) and then do the following:
 - a. Create a new grooming profile.
 - b. Configure settings for each audio track in the source.
 - c. If necessary, configure subtitle grooming settings.
 - d. Click **Save**.
6. From the **Settings** tab, click **Save**.

Creating audio grooming profile

- [Creating an audio grooming profile for TS files](#)
- [Creating an audio grooming profile for MP4 files](#)
- [Creating an audio grooming profile for MXF files](#)
- [Creating an audio grooming profile for MOV files](#)

Creating an audio grooming profile for TS files

TS audio grooming profiles can be applied to SPTS sources.

Before you begin

Ensure that you have configured system languages in **Configure Channels > Settings**.

1. Navigate to the **Asset Acquisition** app > **Settings** tab > **Profiles**.
2. Click the **Create** button to create a TS grooming profile.
3. Enter a **Profile Name**.
4. Select how the grooming profile should be applied to the source audio:

- **Update missing fields only**
 - **Override all fields**
5. On the **Audio** tab, click **Add**, and then configure the following settings for each audio track:
- **PID**: The packet identifier for the audio stream.
 - **Languages**: Configure the languages to be used.
 - **Type**: Select from the following:
 - **Not defined**
 - **Clean effects**
 - **Hearing impaired**
 - **Visual impaired commentary**
 - **Ignore**: Select if you wish to exclude the track from the output.
6. On the **Subtitles** tab, click **Add**, and then configure the following settings:
- **ID**
 - **Type**
 - **Page**
 - **Language**
7. Click **Save**.

About audio grooming for TS files

Audio grooming for TS files is done by matching the PID number in the input file to the PID number in the grooming profile. A grooming profile specifies the list of audio streams expected in the input file.

The list of languages eligible for the grooming profile is based on Configure Channels settings. Asset Acquisition adds audio language and audio type where they are missing in the input file.

When the input file does not contain any descriptors for audio language and a grooming profile is not specified by the user, the following default grooming pattern is applied.

Note

If there is a PID mismatch, or the language specified in the input file does not match the system languages, audio will be dropped from the output.

Input file	System languages	Grooming profile	Output
Audio PID 300 Undefined	EnglishSpanish	Not specified	English
Audio PID 300 Undefined Audio PID 301 Undefined Audio PID 3021 Undefined	EnglishSpanish	Not specified	EnglishSpanish
Audio PID 300	EnglishSpanish	PID 300 English	English

Input file	System languages	Grooming profile	Output
Audio PID 300 undef	EnglishSpanish	PID 100 English	Dropped due to PID mismatch
Audio PID 300Japanese	EnglishSpanish	Not specified	Dropped due to language mismatch
Audio PID 300Japanese	EnglishSpanish	PID 300English	English
Audio PID 300Japanese	EnglishSpanish	PID 301English	Dropped due to PID mismatch and language mismatch

Creating an audio grooming profile for MP4 files

MP4 audio/subtitle grooming profiles can be applied to MP4 sources.

Before you begin

Ensure that you have configured system languages in **Configure Channels** app > **Settings** tab.

1. Navigate to the **Asset Acquisition** app > **Settings** tab > **Profiles**.
2. Click the **Create** button to create a MP4 grooming profile.
3. Enter a **Profile Name**.
4. Select how the grooming profile should be applied to the source audio:
 - **Update missing fields only**
 - **Override all fields**
5. On the **Audio** tab, configure the following settings for each audio track:
 - **Languages**: Configure the languages to be used.

 **Note**

For playout assets, the languages you define for each audio and subtitle track must match the languages defined in the playout source.

- **Type**: Select from the following:
 - **Not defined**
 - **Clean effects**
 - **Hearing impaired**
 - **Visual impaired commentary**
- 6. On the **Subtitles** tab, click **Add**, and then configure the following settings:
 - **ID**

- Type
 - Page
 - Language
7. Click **Save**.

Creating an audio grooming profile for MXF files

MXF audio/subtitle grooming profiles can be applied to transcoded VOD assets. The source audio can have up to 16 mono channels, or 8 stereo pairs.

For playout channels, you can also apply audio grooming profile to primary events that use MXF assets. To do so, specify the profile name in the playlist file or when creating or editing a primary event in the Playout Monitor app.

Before you begin

Ensure that you have configured system languages in **Configure Channels > Settings**.

1. Navigate to the **Asset Acquisition** app> **Settings** tab> **Profiles**.
2. Click the **Create** button to create a MXF grooming profile.
3. Enter a **Profile Name**.
4. Select how the grooming profile should be applied to the source audio:
 - **Update missing fields only**
 - **Override all fields**
5. On the **Audio** tab, configure the following settings for each audio track:
 - **Codec**: Select the codec to be used in the output.

Note

Only PCM audio is supported at this time.

- **Channels**: Configure the channels to be used in the output. Each stereo pair must be configured to use the same language.
- **Languages**: Configure the languages to be used.

Note

For playout assets, the languages you define for each audio and subtitle track must match the languages defined in the playout source.

- **Type**: Select from the following:
 - **Not defined**
 - **Clean effects**
 - **Hearing impaired**
 - **Visual impaired commentary**

6. On the **Subtitles** tab, click **Add**, and then configure the following settings:

- **ID**

- Type
 - Page
 - Language
7. Click **Save**.

Creating an audio grooming profile for MOV files

Create audio/subtitle grooming profile for MOV files.

Note

While grooming on MOV files is available for playout workflow, it does not apply for the VOD with transcode workflow.

Note

For playout channels, you can also apply audio grooming profile to primary events that use MOV assets in the playlist.

To do so, specify the profile name in the playlist file or when creating or editing a primary event in the Playout Monitor app as well as the Rest API call.

Before you begin

Ensure that you have configured system languages in **Configure Channels > Settings**.

1. Navigate to the **Asset Acquisition** app> **Settings** tab> **Profiles**.
2. Click the **Create** button to create a MOV grooming profile.
3. Enter a **Profile Name**.
4. Select how the grooming profile should be applied to the source audio:
 - **Update missing fields only**
 - **Override all fields**
5. On the **Audio** tab, configure the following settings for each audio track:
 - **Codec**: Select the codec to be used in the output.

Note

Only PCM audio is supported at this time.

- **Channels**: Configure the channels to be used in the output. Each stereo pair must be configured to use the same language.
- **Languages**: Configure the languages to be used.

⚠ Note

For playout assets, the languages you define for each audio and subtitle track must match the languages defined in the playout source.

- **Type:** Select from the following:
 - **Not defined**
 - **Clean effects**
 - **Hearing impaired**
 - **Visual impaired commentary**
6. On the **Subtitles** tab, click **Add**, and then configure the following settings:
- **ID**
 - **Type**
 - **Page**
 - **Language**
7. Click **Save**.

Creating LLCU and ECU content

You can extract long lasting catch-up (LLCU) content and create extended catch-up (ECU) content using the Video Editor app.

⚠ Important

The Video Editor app is an alpha-only feature and is intended only for demonstration and evaluation purposes.

Note the following definitions:

Long-lasting catch-up content (LLCU)	LLCU allows you to extract content from an ingest circular buffer, creating a permanent VOD asset that can be played back at any time. LLCU assets can be managed from the Asset Acquisition Library. Like all VOD assets, LLCU assets can have their own packaging profiles and encryption settings totally distinct from the channels they were recorded on.
--------------------------------------	---

Extended catch-up content (ECU)	<p>ECU allows you to pin a from-live time-shift buffer as an asset, which requires less bandwidth than extracting LLCU content. Once pinned, a lock file is created, which prevents the ECU asset from being deleted even when it falls outside the retention period. ECU assets can be managed from the Asset Acquisition Library.</p> <p>ECU assets inherit the packaging profiles and encryption settings of the live channel they are associated with. ECU assets are deleted when their parent channel is deleted.</p>
---------------------------------	---

1. From the Video Editor app, select the service from which you will create LLCU or ECU content.
Result: Live playback begins once the service is loaded.
2. Optionally, to extract from-live content click **Timeshift** and then select from the following:
 - For start over playback, select the date/time and then click **Preview**.
 - For catch up playback, select the date/time and duration, and then click **Preview**.
3. At the desired start point, click **Set Start**.
4. At the desired end point, click **Set End**.
5. To extract an ECU asset, click **Keep**.
Result: The target time-shift buffer is pinned as an ECU asset in the Asset Acquisition Library.
6. To extract an LLCU asset, click **Generate**.
Result: An LLCU extraction job begins, and you can check its status on the **Jobs** page.

Editing a video asset

You can edit video assets in the Asset Acquisition **Library**. For instance, you can apply a different transcoding profile to generate a new asset, add a custom thumbnail, add subtitles, and edit DRM settings.

- [Adding subtitles to a video asset](#)
- [Adding a custom thumbnail to a video asset](#)

Adding subtitles to a video asset

Asset Acquisition support .srt and .stl files, up to 5 MB. Subtitle language options are based on settings in the Configure Channels app.

1. From the **Library** tab, select the asset you wish to edit.
2. Click the **Subtitles** tab, and then browse to and select the subtitle file you wish to add, or drag and drop the subtitle file.
3. Set the subtitle **Language**.
4. Optionally, add more subtitle files.

Info

You may add up to 4 subtitle files per video asset.

5. Click **Save**.

⚠ Important

After you add subtitles to a video, you must re-transcode the asset.

6. From the **Library** tab, select the same video asset.
 7. From the **Video Assets** tab, find the desired transcoding profile and then click **Generate**.
 8. Click **Generate now** to confirm.
- Result:** The asset is sent to the **Ready** queue for processing, and then to the **Jobs** queue. The new asset will be available in the **Library** when the job is complete.

⚠ Note

Due to CDN caching, the video available for preview might not update right away.

Adding a custom thumbnail to a video asset

VOS automatically generates a thumbnail image that is displayed on the **Library** tab. You may override the default thumbnail with one of your choice.

Thumbnail files must meet the following requirements:

.jpeg or .png format
640x360 pixels exactly
up to 10 MB

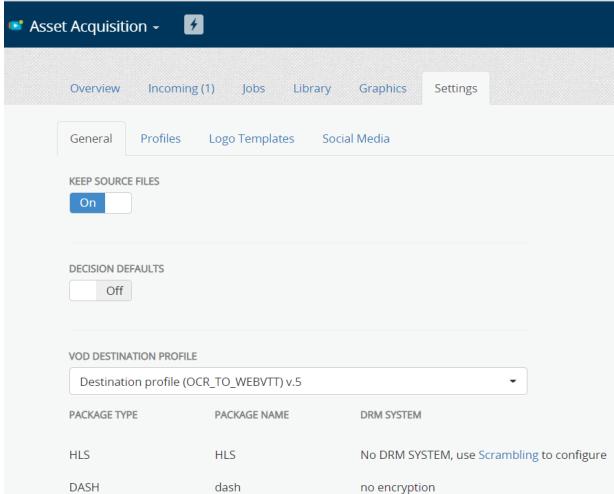
1. From the **Library**, select the asset you wish to edit.
2. Click the **Thumbnails** tab, and then click **Select file** to browse to the file you wish to upload, or drag and drop the file from your desktop.
3. Click **Save** to apply changes.

Result: The new thumbnail is displayed in the **Library**.

Configuring OCR to WebVTT conversion of DVB subtitles for VOD workflow

DVB subtitles are in-band subtitles in MPEG transport stream and can be present inside VOD source files. To use these DVB subtitles in the VOD workflow, you can configure OCR to WebVTT conversion of DVB subtitles via the VOD destination profile.

1. Navigate to **Lab Wizard > Destination** and open the destination profile created for the VOD workflow.
2. For the HLS/DASH packages, configure **DVB Subtitle Handling** to "To WebVTT (OCR)".
3. Navigate to **Asset Acquisition app > Settings tab** and select the **VOD destination profile** with **DVB Subtitle Handling** configured to "To WebVTT (OCR)" .



Note: It is also possible to directly modify the existing VOD destination profile using the API.

4. Navigate to the **Public API** app.
5. Under **Asset Acquisition General**, navigate to **POST/asset-acquisition/v1/grooming-profile**.

⚠ Note

"dvbSubtitleHandling" is not supported via Asset Acquisition UI. Grooming profile must be created/modified via REST API.

The transcoding job is launched with grooming profile that has setting "dvbSubtitleHandling" set to 'OCR_TO_WEBVTT'. It is an inner field of 'subtitlesGrooming' field.

6. Use the HTTP Post to update the 'dvbSubtitleHandling'.

It is acceptable for grooming profile not containing any other grooming information at all. The plain grooming profile to enable OCR for DVB subtitles could be:

```
{
  "id": "ocrProfileId",
  "name": "ocrProfile",
  "audioGrooming": { "audioTracks": [] },
  "subtitlesGrooming": {
    "dvbSubtitleHandling": "OCR_TO_WEBVTT",
    "subtitles": []
  },
  "groomingMode": "UPDATE",
  "groomingFileType": "TS"
}
```

⚠ Note

The "dvbSubtitleHandling" setting is job-wise. Applying OCR to specific DVB subtitle tracks but not others is not supported.

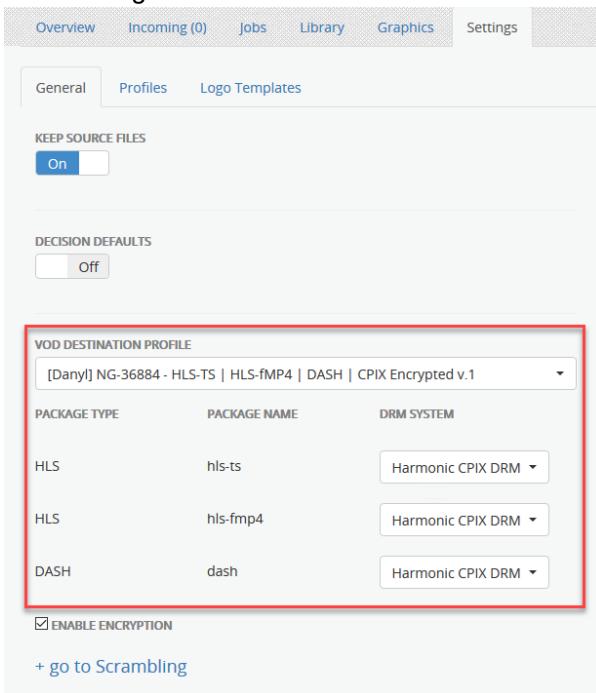
Configuring DRM settings using Harmonic CPIX encryption interface for VOD

You can use the Harmonic CPIX DRM encryption interface with HLS/DASH/SS OTT packaging outputs for VOD workflow.

⚠ Note

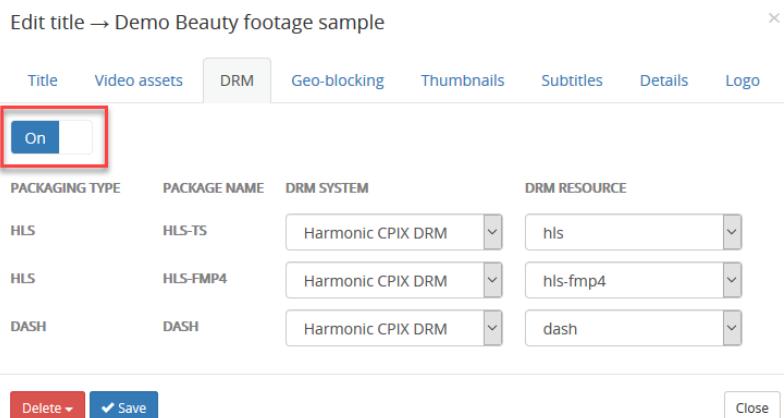
Before you begin, make sure that you have configured a service with encryption using the "Harmonic CPIX" KMS API as described in [Configuring DRM using Harmonic CPIX](#).

1. From the **Asset Acquisition** app, select the **Settings** tab.
2. Choose the **VOD Destination Profile** that you have created for the service and update with appropriate DRM settings.



3. Return to the **Asset Acquisition** app and click on the **Library** tab.
4. Locate the asset you want to modify and click the **Edit** icon.
5. Select the **DRM** tab.

6. Use the slider to turn the DRM feature **On**.



7. Update with appropriate DRM settings for the VOD asset.

Related information

[Configuring DRM using Harmonic CPIX](#)

[Configuring DRM using Apple CPIX](#)

[Configuring DRM using Internal KMS](#)

Manifest customization and manipulation

The ATM app, or Ad Targeting Module, allows you to manipulate manifests in a number of ways. At this time, the ATM app is supported via REST API only.

- [Manifest filtering profiles](#)
- [Live manifest health check](#)

Manifest filtering profiles

A manifest filtering profile allows you to optimize CDN caching by creating a single output package and then filtering streams for different end devices.

The following criteria can be used to filter streams:

- For Video: Bitrate, codec, vertical/ horizontal resolution, frame rate, index.
- For Audio: Bitrate, codec, audio with gain, index.
- For HLS only: Preferred video stream index.

Refer to the [Manifest filtering profile JSON model](#) for details.

- [Creating a manifest filtering profile](#)
- [Manifest filtering profile reference information](#)
- [Use cases for manifest filtering profiles](#)
- [Configuring manifest filtering profile for 1+1 geo-redundancy](#)

Creating a manifest filtering profile

After you create the manifest filtering profile, you can preview the playlist in a web-based video player.

Before you begin

Configure a multiscreen service

1. From the VOS System app, select **DevOps Portal > Developer API**.
2. From the Developer API page, click **ATM**.
3. Click **POST /atm/V1/manifest-filtering/profiles**.
4. Configure the manifest filtering profile as needed.
5. Click **Try it Out!**
6. To preview the playlist, modify the egress URL for the desired output type by adding the manifest filtering profile name, as shown below.
HLS output

Type	Egress URL	Example
VOD	/Content/<Package Profile Publishing Name>/VOD/<Asset Path>/index_<Manifest Filtering Profile Name>.m3u8	/Content/HLS_1/VOD/test6/clip12/index_HD.m3u8
Live	/Content/<Package Profile Publishing Name>/Live/Channel(<Service Name>)/index_<Manifest Filtering Profile Name>.m3u8	/Content/hls_1/Live/Channel(liveService1)/index_hd.m3u8

SS output

Type	Egress URL	Example
VOD	/Content/<Package Profile Publishing Name>/VOD/<Asset Path>.ism/Manifest_<Manifest Filtering Profile Name>	/Content/SS_1/VOD/test6/clip12.ism/Manifest_SD
Live	/Content/<Package Profile Publishing Name>/Live/Channel(<Service Name>).isml/Manifest_<Manifest Filtering Profile Name>	/Content/ss_1/Live/Channel(liveService1).isml/Manifest_hd

DASH output

Type	Egress URL	Example
VOD	/Content/<Package Profile Publishing Name>/VOD/<Asset Path>/manifest_<Manifest Filtering Profile Name>.mpd	/Content/DASH_1/VOD/test6/clip12/manifest_SD.mpd
Live	/Content/<Package Profile Publishing Name>/Live/Channel(<Service Name>)/manifest_<Manifest Filtering Profile Name>.mpd	/Content/dash_1/Live/Channel(liveService1)/manifest_hd.mpd

Related information

[Use cases for manifest filtering profiles](#)

[Manifest filtering profile reference information](#)

Manifest filtering profile reference information

The ATM REST API supports the following calls for managing manifest filtering profiles.

HTTP Request	URL pattern	Description
GET	/atm/v1/manifest-filtering/profiles	Get information of all manifest filtering profiles.
POST	/atm/v1/manifest-filtering/profiles	Add a manifest filtering profile.
Delete	/atm/v1/manifest-filtering/profiles/{id}	Delete a manifest filtering profile by ID.
GET	/atm/v1/manifest-filtering/profiles/{id}	Get information of a manifest filtering profile by ID.
PUT	/atm/v1/manifest-filtering/profiles/{id}	Update a manifest filtering profile by ID.

Manifest filtering profile JSON model

```

Inline Model [Profile]
Profile {
    audioStreamSelections (Array[AudioStreamSelection], optional): Audio Stream
    Selections ,
    id (string): id of the manifest filtering profile ,
    name (string): name of the manifest filtering profile ,
    preferredVideoStreamIndex (integer, optional): Select video stream as default video,
    range from one to the length of video streams in original playlist ,
    videoStreamSelections (Array[VideoStreamSelection], optional): Video Stream Selections
}
AudioStreamSelection {
    audioCodecSelection (string): Settings of Audio Codec Selection = ['AAC_LC',
    'HE_AAC_V1', 'HE_AAC_V2', 'AC_3', 'E_AC_3', 'ALL'],
    bitrateRange (BitrateRange): Filtering bitrate - min and max ,
    indexRanges (Array[IndexRange], optional): Filtering index - min and max ,
    withAudioGain (string, optional): Filtering audios with gain applied at the
    transcoding stage and audios without = ['ENABLE', 'DISABLE', 'ALL']
}
VideoStreamSelection {
    bitrateRange (BitrateRange, optional): Filtering bitrate - min and max ,
    frameRateRange (FrameRateRange, optional): Filtering frame rate - min and max ,
    horizontalResolutionRange (HorizontalResolutionRange, optional): Filtering horizontal
    resolution - min and max ,
    indexRanges (Array[IndexRange], optional): Filtering index - min and max ,
    verticalResolutionRange (VerticalResolutionRange, optional): Filtering vertical
    resolution - min and max ,
    videoCodecSelection (string): Settings of video codec selection = ['H_265', 'H_264',
    'ALL']
}

```

```

BitrateRange {
    esBitrateRange (StreamBitrateRange, optional): Filtering DASH/SS bitrate - min and
    max ,
    exclude (boolean, optional),
    maxBitrateInbps (integer, optional): (Deprecated) Settings of max bitrate in bps ,
    minBitrateInbps (integer, optional): (Deprecated) Settings of min bitrate in bps ,
    tsBitrateRange (StreamBitrateRange, optional): Filtering HLS bitrate - min and max
}
IndexRange {
    maxIndex (integer, optional): Settings of max index ,
    minIndex (integer, optional): Settings of min index ,
    type (string, optional): Type of packaging = ['HLS', 'DASH', 'SS']
}
FrameRateRange {
    maxFrameRate (number, optional): Settings of max frame rate ,
    minFrameRate (number, optional): Settings of min frame rate
}
HorizontalResolutionRange {
    maxHorizontalResolution (integer, optional): Max horizontal resolution ,
    minHorizontalResolution (integer, optional): Min horizontal resolution
}
VerticalResolutionRange {
    maxVerticalResolution (integer, optional): Max vertical resolution ,
    minVerticalResolution (integer, optional): Min vertical resolution
}
StreamBitrateRange {
    maxBitrateInbps (integer, optional): Settings of max bitrate in bps ,
    minBitrateInbps (integer, optional): Settings of min bitrate in bps
}

```

Sample manifest filtering profile

```
{
    "id": "sample",
    "name": "sd",
    "audioStreamSelections": [
        {
            "withAudioGain": "ENABLE"
        }
    ],
    "videoStreamSelections": [
        {
            "bitrateRange": {
                "esBitrateRange": {
                    "maxBitrateInbps": 1800000
                },
                "tsBitrateRange": {
                    "maxBitrateInbps": 3000000
                }
            }
        }
    ]
}
```

```

        }
    }
],
"preferredVideoStreamIndex": 4
}

```

Note

The "0" value for any numeric field in an ATM manifest filtering profile is regarded as the default value, and will be ignored, such that filtering will not take place.

Use cases for manifest filtering profiles

Learn which filtering criteria to apply depending on your use case.

- [tsBitrateRange](#)
- [esBitrateRange](#)
- [audioStreamSelections](#)
- [videoStreamSelections](#)
- [indexRanges](#)

tsBitrateRange

`tsBitrateRange` is used for filtering **HLS** bitrates and takes effect only on the **HLS** playlist.

For example, you may use the following filtering criteria in `tsBitrateRange`:

```
{
  "videoStreamSelections": [
    {
      "bitrateRange": {
        "tsBitrateRange": {
          "maxBitrateInbps": 3000000,
          "minBitrateInbps": 2500000
        }
      }
    }
  ]
}
```

The table below lists the variant stream properties and associated filtering results for HLS/DASH/SS output:

	TS Bitrate (bps) [HLS]	ES Bitrate (bps) [DASH/SS]	HLS Output	DASH Output	SS Output
1	2029854	1300000	Excluded	Included	Included
2	2591810	1800000	Included	Included	Included
3	3378550	2500000	Excluded	Included	Included

esBitrateRange

esBitrateRange is used for filtering **DASH/SS** bitrates and takes effect only on the **DASH/SS** playlist.

For example, you may use the following filtering criteria in esBitrateRange:

```
{
  "videoStreamSelections": [
    {
      "bitrateRange": {
        "esBitrateRange": {
          "maxBitrateInbps": 1800000,
          "minBitrateInbps": 0
        }
      }
    }
  ]
}
```

The table below lists the variant stream properties and associated filtering results for HLS/DASH/SS output:

	TS Bitrate (bps) [HLS]	ES Bitrate (bps) [DASH/SS]	HLS Output	DASH Output	SS Output
1	2029854	1300000	Included	Included	Included
2	2591810	1800000	Included	Included	Included
3	3378550	2500000	Included	Excluded	Excluded

audioStreamSelections

You can select particular audio streams as output only if a full set of filtering criteria in `audioStreamSelections` is fulfilled.

In addition, when there are multiple sets of filtering criteria in `audioStreamSelections`, the streams fulfilling any sets of the criteria will be selected.

For example, you may use the following filtering criteria in `audioStreamSelections`:

```
{
  "audioStreamSelections": [
    {
      "audioCodecSelection": "HE_AAC_V1",
      "withAudioGain": "DISABLE"
    },
    {
      "audioCodecSelection": "AC_3",
      "withAudioGain": "ENABLE"
    }
  ]
}
```

The table below lists the variant stream properties and associated filtering results for HLS/DASH/SS output:

	Codec	Gain (dB)	HLS/DASH/SS Output
1	AAC-LC	0	Excluded
2	HE-AAC v1	-4	Excluded
3	HE-AAC v1	0	Included (matches the 1st set of <code>audioStreamSelections</code>)
4	AC3	+11	Included (matches the 2nd set of <code>audioStreamSelections</code>)

videoStreamSelections

You can select particular video streams as output only if a full set of filtering criteria in `videoStreamSelections` is fulfilled.

In addition, when there are multiple sets of filtering criteria in `videoStreamSelections`, the streams fulfilling any set of the criteria will be selected.

For example, you may use the following filtering criteria in `videoStreamSelections`:

```
{
  "videoStreamSelections": [
    {
      "horizontalResolutionRange": {
        "maxHorizontalResolution": 1920,
        "minHorizontalResolution": 1280
      },
      "verticalResolutionRange": {
        "maxVerticalResolution": 900,
        "minVerticalResolution": 720
      }
    },
    {
      "frameRateRange": {
        "maxFrameRate": 29.971,
        "minFrameRate": 0
      }
    }
  ]
}
```

The table below lists the variant stream properties and associated filtering results for HLS/DASH/SS output:

	Resolution (W x H)	Frame Rate (fps)	HLS/DASH/SS Output
1	1920 x 1080	59.94	Excluded
2	1920 x 1080	59.94	Included (matches 1st set of videoStreamSelections)
3	1280 x 720	29.97	Included (matches both sets of videoStreamSelections)
4	640 x 360	14.985	Included (matches 2nd set of videoStreamSelections)

indexRanges

Streams can be filtered by their index number in the original playlist. You can apply index ranges to audio streams and video streams separately.

For HLS, audioStreamSelections will filter late-binding audios (#EXT-X-MEDIA:TYPE=AUDIO), while videoStreamSelections will filter video streams, audio-only streams and i-frame streams (#EXT-X-STREAM-INF and #EXT-X-I-FRAME-STREAM-INF).

You may use the following criteria in indexRanges for audioStreamSelections and videoStreamSelections:

```
{  
  "audioStreamSelections": [  
    {  
      "indexRanges": [  
        {  
          "maxIndex": 1,  
          "minIndex": 1,  
          "type": "HLS"  
        },  
        {  
          "maxIndex": 1,  
          "minIndex": 1,  
          "type": "DASH"  
        },  
        {  
          "maxIndex": 1,  
          "minIndex": 1,  
          "type": "SS"  
        }  
      ]  
    }  
  ],  
  "videoStreamSelections": [  
    {  
      "indexRanges": [  
        {  
          "maxIndex": 7,  
          "minIndex": 4,  
          "type": "HLS"  
        },  
        {  
          "maxIndex": 2,  
          "minIndex": 2,  
          "type": "DASH"  
        },  
        {  
          "maxIndex": 2,  
          "minIndex": 2,  
          "type": "SS"  
        }  
      ]  
    }  
  ]  
}
```

HLS stream filtering example

```
#EXTM3U
#EXT-X-VERSION:4
#EXT-X-INDEPENDENT-SEGMENTS

[Audio Index #1]
#EXT-X-MEDIA:TYPE=AUDIO, GROUP-
ID="audio1", NAME="ENG_1", DEFAULT=YES, AUTOSELECT=YES, LANGUAGE="ENG", URI="03.m3u8"

[Audio Index #2]
#EXT-X-MEDIA:TYPE=AUDIO, GROUP-
ID="audio2", NAME="ENG_2", DEFAULT=YES, AUTOSELECT=YES, LANGUAGE="ENG", URI="04.m3u8"

[Video Index #1]
#EXT-X-STREAM-INF:PROGRAM-
ID=1, BANDWIDTH=413747, CODECS="avc1.4D401F,mp4a.40.5", RESOLUTION=640x360, FRAME-
RATE=29.970, AUDIO="audio1"
02.m3u8

[Video Index #2]
#EXT-X-STREAM-INF:PROGRAM-
ID=1, BANDWIDTH=479139, CODECS="avc1.4D401F,mp4a.40.5", RESOLUTION=640x360, FRAME-
RATE=29.970, AUDIO="audio2"
02.m3u8

[Video Index #3]
#EXT-X-I-FRAME-STREAM-INF:PROGRAM-
ID=1, BANDWIDTH=7486, CODECS="avc1.4D401F", RESOLUTION=640x360, URI="02-iframe.m3u8"

[Video Index #4]
#EXT-X-STREAM-INF:PROGRAM-ID=1, BANDWIDTH=66034, CODECS="mp4a.40.5", AUDIO="audio1"
03.m3u8

[Video Index #5]
#EXT-X-STREAM-INF:PROGRAM-
ID=1, BANDWIDTH=249279, CODECS="avc1.4D401F,mp4a.40.5", RESOLUTION=426x240, FRAME-
RATE=14.985, AUDIO="audio1"
01.m3u8

[Video Index #6]
#EXT-X-STREAM-INF:PROGRAM-
ID=1, BANDWIDTH=314671, CODECS="avc1.4D401F,mp4a.40.5", RESOLUTION=426x240, FRAME-
RATE=14.985, AUDIO="audio2"
```

```
01.m3u8
```

```
[Video Index #7]
#EXT-X-I-FRAME-STREAM-INF:PROGRAM-
ID=1,BANDWIDTH=4916,CODECS="avc1.4D401F",RESOLUTION=426x240,URI="01-iframe.m3u8"
```

The following is the filtering result for HLS output:

```
#EXTM3U
#EXT-X-VERSION:4
#EXT-X-INDEPENDENT-SEGMENTS

[Audio Index #1]
#EXT-X-MEDIA:TYPE=AUDIO,GROUP-
ID="audio1",NAME="ENG_1",DEFAULT=YES,AUTOSELECT=YES,LANGUAGE="ENG",URI="03.m3u8"

[Video Index #4]
#EXT-X-STREAM-INF:PROGRAM-ID=1,BANDWIDTH=66034,CODECS="mp4a.40.5",AUDIO="audio1"
03.m3u8

[Video Index #5]
#EXT-X-STREAM-INF:PROGRAM-
ID=1,BANDWIDTH=249279,CODECS="avc1.4D401F,mp4a.40.5",RESOLUTION=426x240,FRAME-
RATE=14.985,AUDIO="audio1"
01.m3u8

[Video Index #6]
#EXT-X-STREAM-INF:PROGRAM-
ID=1,BANDWIDTH=314671,CODECS="avc1.4D401F,mp4a.40.5",RESOLUTION=426x240,FRAME-
RATE=14.985,AUDIO="audio2"
01.m3u8

[Video Index #7]
#EXT-X-I-FRAME-STREAM-INF:PROGRAM-
ID=1,BANDWIDTH=4916,CODECS="avc1.4D401F",RESOLUTION=426x240,URI="01-iframe.m3u8"
```

DASH stream filtering example

```
<AdaptationSet mimeType="video/mp4" startWithSAP="1" segmentAlignment="true">
    ...
    [Video Index #1]
    <Representation width="320" height="240" frameRate="15000/1001" codecs="avc1.4d401f" scanType="progressive" id="1534928145250item-1item" bandwidth="128000" />
    [Video Index #2]
    <Representation width="480" height="360" frameRate="30000/1001" codecs="avc1.4d401f" scanType="progressive" id="1534928145250item-2item" bandwidth="250000" />
</AdaptationSet>

<AdaptationSet mimeType="audio/mp4" startWithSAP="1" lang="eng" segmentAlignment="true">
    ...
    [Audio Index #1]
    <Representation audioSamplingRate="24000" codecs="mp4a.40.5" id="1534928145250item-3item" bandwidth="32000" />
</AdaptationSet>

<AdaptationSet mimeType="audio/mp4" startWithSAP="1" lang="eng" segmentAlignment="true">
    ...
    [Audio Index #2]
    <Representation audioSamplingRate="24000" codecs="mp4a.40.5" id="1534928145250item-4item" bandwidth="96000" />
</AdaptationSet>
```

The following is the filtering result for DASH output:

```
<AdaptationSet mimeType="video/mp4" startWithSAP="1" segmentAlignment="true">
    ...
    [Video Index #2]
    <Representation width="480" height="360" frameRate="30000/1001" codecs="avc1.4d401f" scanType="progressive" id="1534928145250item-2item" bandwidth="250000" />
</AdaptationSet>

<AdaptationSet mimeType="audio/
mp4" startWithSAP="1" lang="eng" segmentAlignment="true">
    ...
    [Audio Index #1]
    <Representation audioSamplingRate="24000" codecs="mp4a.40.5" id="1534928145250item-3item" bandwidth="32000" />
</AdaptationSet>
```

SS stream filtering example

```

<StreamIndex Type="video" Name="video" Language="und" Subtype="" Chunks="30" Url
="QualityLevels({bitrate})/Fragments(video={start time})" QualityLevels="7">

[Video Index #1]
<QualityLevel Index="0" Bitrate="128000" CodecPrivateData="0000" FourCC="AVC1" M
axWidth="320" MaxHeight="240" FrameRate="14.985" />

[Video Index #2]
<QualityLevel Index="1" Bitrate="250000" CodecPrivateData="0000" FourCC="AVC1" M
axWidth="480" MaxHeight="360" FrameRate="29.970" />
    ...
</StreamIndex>

<StreamIndex Type="audio" Name="audio_eng" Language="ENG" Subtype="" Chunks="31"
Url="QualityLevels({bitrate})/
Fragments(audio_eng={start time})" QualityLevels="1">

[Audio Index #1]
<QualityLevel Index="0" Bitrate="32000" CodecPrivateData="1310" FourCC="AACL" Au
dioTag="255" Channels="2" SamplingRate="24000" BitsPerSample="16" PacketSize="4"
/>
    ...
</StreamIndex>

<StreamIndex Type="audio" Name="audio_eng_1" Language="ENG" Subtype="" Chunks="3
1" Url="QualityLevels({bitrate})/
Fragments(audio_eng_1={start time})" QualityLevels="1">

[Audio Index #2]
<QualityLevel Index="0" Bitrate="96000" CodecPrivateData="1310" FourCC="AACL" Au
dioTag="255" Channels="2" SamplingRate="24000" BitsPerSample="16" PacketSize="4"
/>
    ...
</StreamIndex>
```

The following is the filtering result for SS output:

```
<StreamIndex Type="video" Name="video" Language="und" Subtype="" Chunks="30" Url="QualityLevels({bitrate})/Fragments(video={start time})" QualityLevels="7">
```

[Video Index #2]

```
<QualityLevel Index="1" Bitrate="250000" CodecPrivateData="0000" FourCC="AVC1" MaxWidth="480" MaxHeight="360" FrameRate="29.970" />
```

...

```
</StreamIndex>
```

```
<StreamIndex Type="audio" Name="audio_eng" Language="ENG" Subtype="" Chunks="31" Url="QualityLevels({bitrate})/Fragments(audio_eng={start time})" QualityLevels="1">
```

[Audio Index #1]

```
<QualityLevel Index="0" Bitrate="32000" CodecPrivateData="1310" FourCC="AACL" AudioTag="255" Channels="2" SamplingRate="24000" BitsPerSample="16" PacketSize="4" />
```

...

```
</StreamIndex>
```

Configuring manifest filtering profile for 1+1 geo-redundancy

The manifest filtering profile can be configured for accomplishing geo-redundancy purposes.

Prerequisites

- 1+1 clusters setup.
- One cluster is set as **Cluster A** while the other cluster is set as **Cluster B**.

⚠ Note

When the manifests of Cluster A and Cluster B have the same length, the manifest of Cluster A will always be returned.

Cluster A configurations

1. Navigate to **Developer API** from the **DevOps** app.

2. Go to the ATM.

ATM		Show/Hide	List Operations	Expand Operations
GET	/atm/v1/manifest-filtering/profiles		Get all manifest filtering profiles	DEV
POST	/atm/v1/manifest-filtering/profiles		Set manifest filtering profile	DEV
DELETE	/atm/v1/manifest-filtering/profiles/{id}		Delete manifest filtering profile	
GET	/atm/v1/manifest-filtering/profiles/{id}		Get manifest filtering profile	
PUT	/atm/v1/manifest-filtering/profiles/{id}		Update manifest filtering profile	

3. Create a manifest filtering profile.

- Execute the POST /atm/v1/manifest-filtering/profiles call.

Implementation Notes
set manifest filtering profile

Parameters

Parameter	Value	Description	Parameter Type	Data Type
profile	<pre>{ "audioStreamSelections": [{ "audioCodecSelection": "AAC_LC", "bitrateRange": { "maxBitrateInbps": 0, "minBitrateInbps": 0 } }] }</pre>	profile	body	<div style="border: 1px solid #ccc; padding: 5px;"> <pre>{ "audioStreamSelections": [{ "audioCodecSelection": "AAC_LC", "bitrateRange": { "maxBitrateInbps": 0, "minBitrateInbps": 0 } }], "id": "string", "name": "string". }</pre> </div>
Parameter content type:	application/json			

- Define the parameters in the "playlistSelection" field and set "preferredHost": local.

```
"playlistSelection": {
  "preferredHost": local,
  "alternativeUrlPrefix": //specify alternative cluster's egress prefix
url, it should be: http/https protocol + egress ip of alternative VOS + http/
https protocol port
  e.g. "https://35.244.152.222"
}
```

Example profile:

VOS1

```
{
  "id": "plus",
  "name": "plus",
  "audioStreamSelections": [],
  "videoStreamSelections": [],
  "dvrWindowSize": 0,
```

```

    "minDvrInSecond": 0,
    "preferredVideoStreamIndex": 0,
    "preferredLanguage": null,
    "playlistSelection": {
        "preferredHost": "local",
        "alternativeUrlPrefix": "https://35.244.152.222"
    }
}

```

Cluster B configurations

1. Repeat steps **1-3** of the Cluster A settings.
2. Define the parameters in the "playlistSelection" field.
 - a. Set "preferredHost": alternative

```

"playlistSelection": {
    "preferredHost": alternative,
    "alternativeUrlPrefix": //specify alternative cluster's egress prefix
url, it should be: http/https protocol + egress ip of alternative VOS + http/
https protocol port
                                e.g. "https://35.244.152.222"
}

```

Example profile:

VOS2

```

{
    "id": "plus",
    "name": "plus",
    "audioStreamSelections": [],
    "videoStreamSelections": [],
    "dvrWindowSize": 0,
    "minDvrInSecond": 0,
    "preferredVideoStreamIndex": 0,
    "preferredLanguage": null,
    "playlistSelection": {
        "preferredHost": "alternative",
        "alternativeUrlPrefix": "https://35.190.77.227"
    }
}

```

Live manifest health check

External systems such as load balancers can utilize a simple HTTP call to check the status of a live manifest or multiple master playlist.

Health check request URL:

`http(s)://<host>/HealthCheck/<packagePublishingName>/Live/channel(<channelId, channelId>)/<masterPlaylistName>?lastUpdateTime=<expectedLastUpdateTime>`

URL parameters

<host>	Provide the cluster IP address or host name.
<packagePublishingName>	The publish name, as configured in the service destination.
<channelId, channelId>	You may use either the channel ID or the channel name in the URL.
<masterPlaylistName>	Provide the master playlist name with file extension. For example: <ul style="list-style-type: none"> • index.m3u8 (if checking the original master playlist) • index_<Manifest Filtering Profile Name>.m3u8 (if checking a multiple master playlist)
<expectedLastUpdateTime>	Enter a period of time in seconds. If not specified, the default value is 4 seconds.

For Dash and SS, the manifest last modified time is determined by the Last-Modified attribute of the returned HTTP headers of the master playlist.

For HLS, the manifest last modified time is determined by the Last-Modified attribute of the returned HTTP headers of one of the stream playlists.

Responses

HTTP 200	Live manifest was last modified within the <expectedLastUpdateTime>
HTTP 500	Live manifest is stale
HTTP 404	Live manifest not found

Updating VOS

Follow all instructions to ensure that the update procedures do not impact the services running on your VOS Cloud-Native Software.

- [Creating a snapshot](#)
- [Restoring a snapshot](#)
- [Resetting the system](#)
- [Upgrading VOS Runtime and system apps](#)

Creating a snapshot

Snapshots are saved automatically every 24 hours (default behavior), but you can manually make a snapshot anytime from the Versions app.

Note

The VOS Cloud-Native Software must be connected to the Harmonic Hub for snapshot storage.

1. From **Versions > Snapshot**, select the VOS Cloud-Native Software that you want to back up.
2. Click **Make New Snapshot** and then click **Back up now** to confirm.

Restoring a snapshot

If you make an update that results in unexpected system behavior, you can revert the Runtime to a previous, stable snapshot in the same VOS software bundle. You can also select a snapshot from another Runtime belonging to the same Harmonic VOS account to clone on the Runtime you are using in the active session. This can be useful for configuring a new Runtime.

Restoring a snapshot overwrites the current VOS Cloud-Native Software data, including users, transcoding profiles, services, and other settings. Items added to the VOS Cloud-Native Software after the snapshot was created will not be restored. For example, if User A is added on May 2, and the snapshot from May 1 is then used to restore the system, User A will not have an account, because that account did not exist on May 1.

Note

Restoring a snapshot from a previous VOS software bundle is not supported.

Note

The Runtime will be unavailable during the revert procedure, and any running services will be stopped until the Runtime has restarted.

⚠ Note

The VOS Cloud-Native Software must be connected to the Harmonic Hub during this procedure.

1. From **Versions > Snapshot**, click the VOS Cloud-Native Software that you want to update.
2. From the **Snapshot** list, select the snapshot you want to restore and then click **Proceed with Selection**.
3. Click **Revert Now** to confirm.

Result: A progress bar displays. The procedure should take about one minutes, and then the VOS log in screen will appear.

Resetting the system

Only Super Admins can reset the system.

⚠ Warning

Resetting the system deletes user accounts, services, sources, and other configuration settings and configured items. The system should be reset only if you need to completely rebuild your VOS Cloud-Native Software environment.

1. From the System app, click **Settings**.
2. From the **Settings** page, on the **General** tab, click **Reset the System**.
3. Click **Yes, Reset the System**.

Upgrading VOS Runtime and system apps

Upgrading VOS application bundle can be upgraded using the versions app for minor version upgrade.

VOS runtime and major upgrades must be performed by Harmonic personnel, according to the upgrade plan agreed upon deployment (rolling upgrade, blue/green upgrade). Please contact your Harmonic contact for upgrade details.

Monitoring and troubleshooting

Use middleware components, the VOS REST API, as well as the Logs and Notifications apps to monitor system resources.

- Monitoring statistics with the Origin app
- Monitoring time-shift content
- Monitoring resources
- Managing notifications
- VOS notifications list
- Logs and reporting
- Monitoring status and statistics with the Manipulator app
- Service placement optimization and resources reservation for demanding UHD services

Monitoring statistics with the Origin app

Use the Origin app to monitor delivery statistics and circular buffer health for individual services.

- Monitoring individual Origin services
- Viewing Origin access logs

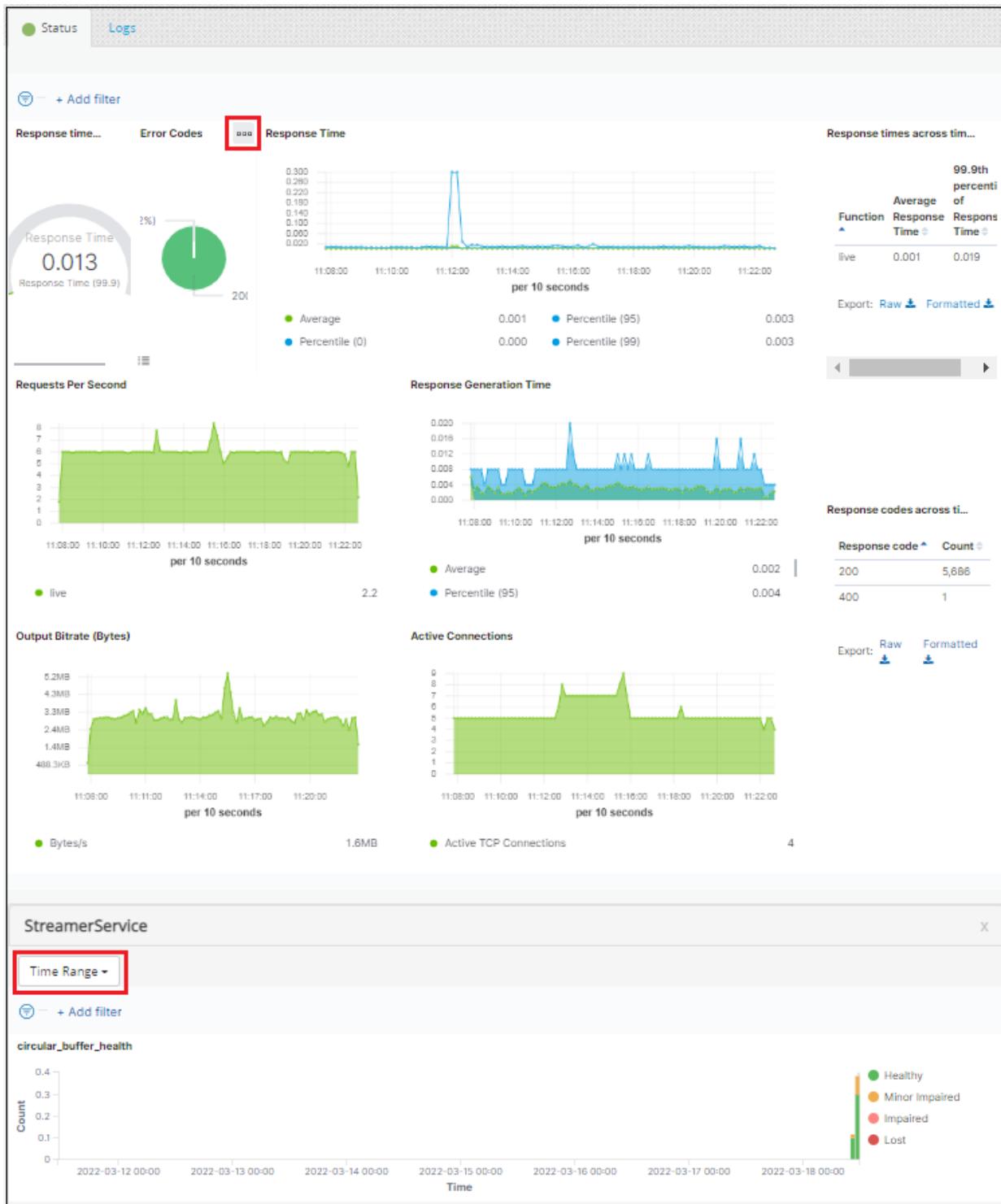
Monitoring individual Origin services

You can monitor delivery statistics and logs for individual services through the dashboard from the Origin app.

- Status tab
- Logs tab

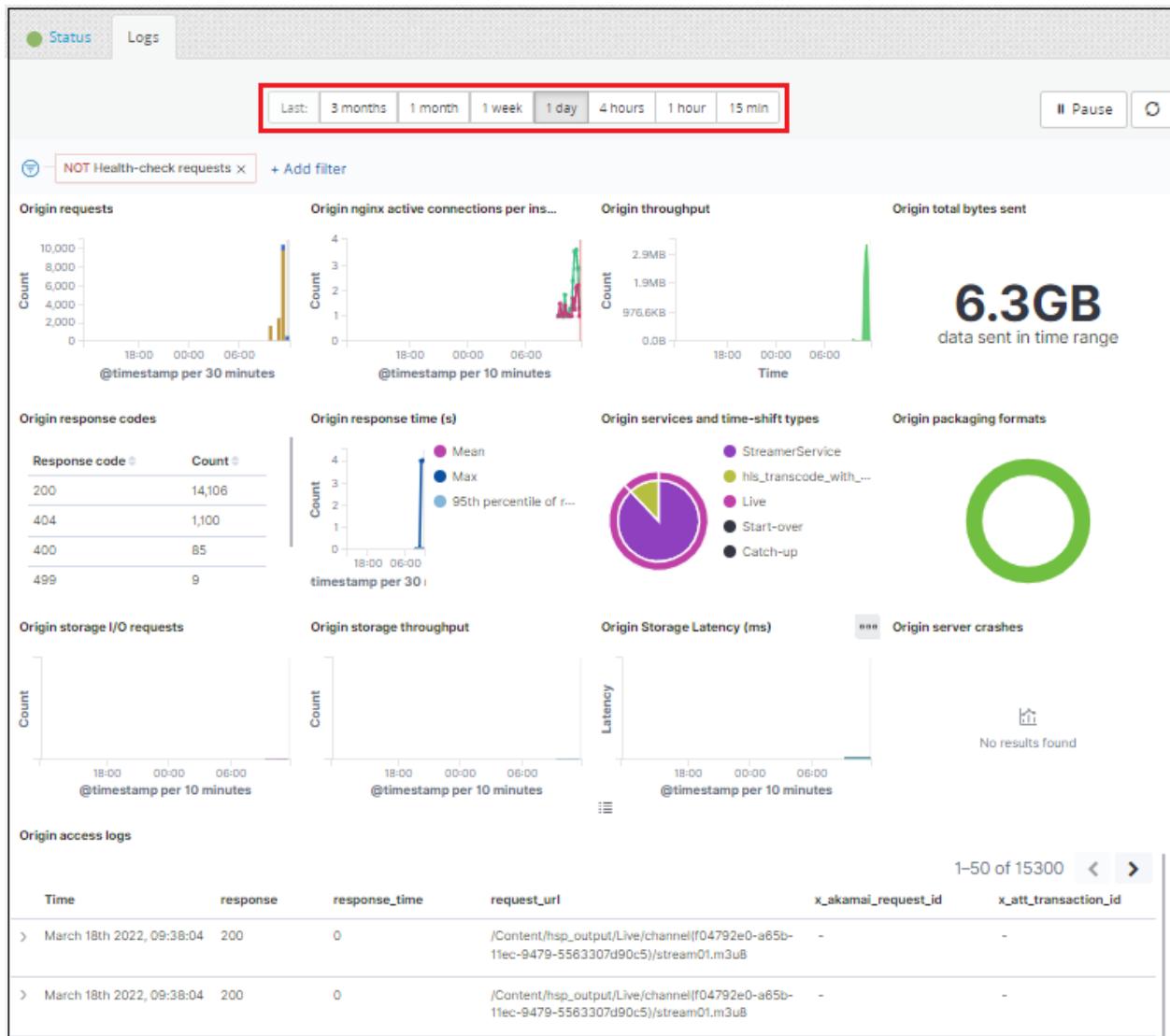
Status tab

- Enables you to monitor and baseline delivery statistics.
- Uses the Kibana application to monitor circular buffer health for individual time-shift (Start-over, Catch-up, Long-Lasting Catch-up) services.
 - For each metric, use the  button to monitor statistics on full screen or with additional details.
 - Change the **Time Range** to monitor the time period of interest.



Logs tab

- To access the **Health-check requests** visualizations, from the Origin app, click **Logs**.
 - Select the desired duration for the logs.



Viewing Origin access logs

You can view access logs from the Origin app.

- From the Origin app, click **Logs**.

2. Scroll up and down the page to view the Origin access logs.

Origin access logs

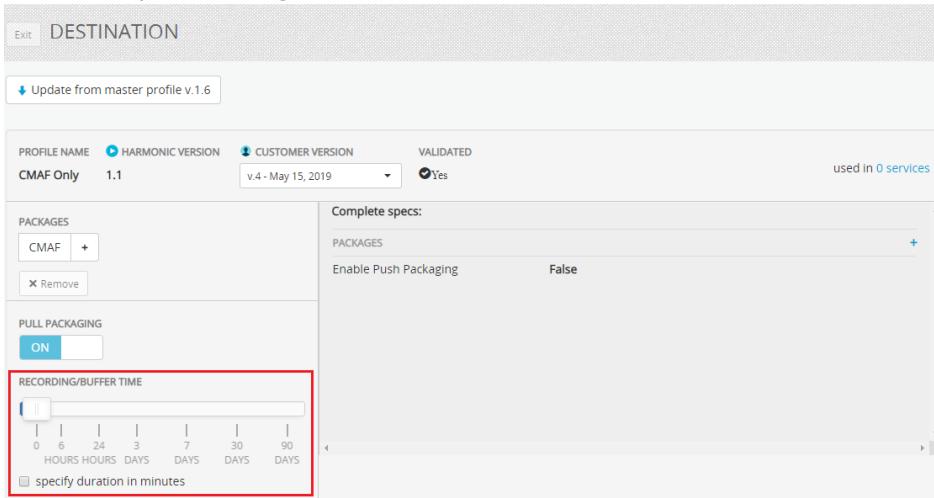
Origin access logs						
Time	response	response_time	request_url	x_akamai_request_id	x_att_transaction_id	1–50 of 20524
> March 18th 2022, 09:38:04	200	0	/Content/hsp_output/Live/channel(f04792e0-a65b-11ec-9479-5563307d90c5)/stream01.m3u8	-	-	< >
> March 18th 2022, 09:38:04	200	0	/Content/hsp_output/Live/channel(f04792e0-a65b-11ec-9479-5563307d90c5)/stream01.m3u8	-	-	< >
> March 18th 2022, 09:38:04	200	0	/Content/hsp_output/Live/channel(f04792e0-a65b-11ec-9479-5563307d90c5)/stream01.m3u8	-	-	< >
> March 18th 2022, 09:38:04	200	0	/Content/hsp_output/Live/channel(f04792e0-a65b-11ec-9479-5563307d90c5)/stream01.m3u8	-	-	< >
> March 18th 2022, 09:38:04	200	0	/Content/hsp_output/Live/channel(f04792e0-a65b-11ec-9479-5563307d90c5)/stream01.m3u8	-	-	< >
> March 18th 2022, 09:38:04	200	0	/Content/hsp_output/Live/channel(f04792e0-a65b-11ec-9479-5563307d90c5)/index.m3u8	-	-	< >
> March 18th 2022, 09:38:04	200	0	/Content/hsp_output/Live/channel(f04792e0-a65b-11ec-9479-5563307d90c5)/stream01.m3u8	-	-	< >

Monitoring time-shift content

Monitor the time-shift content using the Monitor Channels app.

- The time shift publishing parameter is configured from the Destination Multiscreen profile.
 - RECORDING/BUFFER TIME**
- Enable the **specify duration in minutes** checkbox to fill in the minutes as desired.
- Previewed content should be at least one minute before live playout

Destination profile configuration in Lab Wizard



Setting the duration for previewing time-shift content

You can preset the duration for previewing the video output.

1. From the Monitor Channels app, click the name of your service.
2. From the Origin panel, click the **Watch Output Video** icon.
3. From the video player, click **Timeshift**.
4. Click the **START TIME** Time Selector and then use the up and down arrows to enter the video start time.
5. Click the **Hrs** and/or the **Mins** list, and select the video **DURATION**.
6. To start the play back of the time-shifted content, click **Preview**.
7. When you are finished, click **Close**.

Monitoring resources

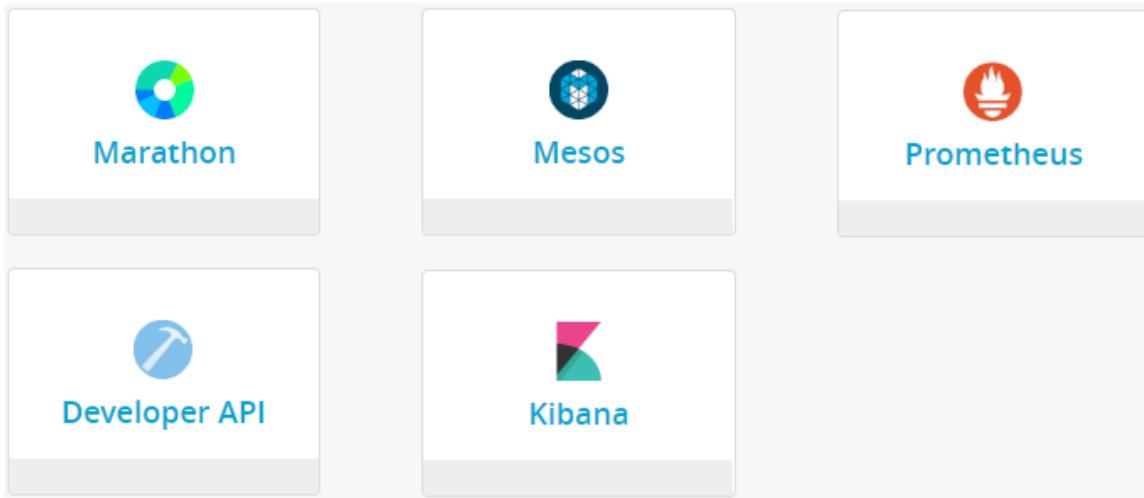
Monitor VOS Cloud-Native Software resources with middleware components such as Mesos, Marathon, Prometheus, and Kibana.

- [DevOps Portal page overview](#)
- [Developer API](#)
- [Mesos](#)
- [Marathon](#)
- [Prometheus](#)
- [Kibana](#)

DevOps Portal page overview

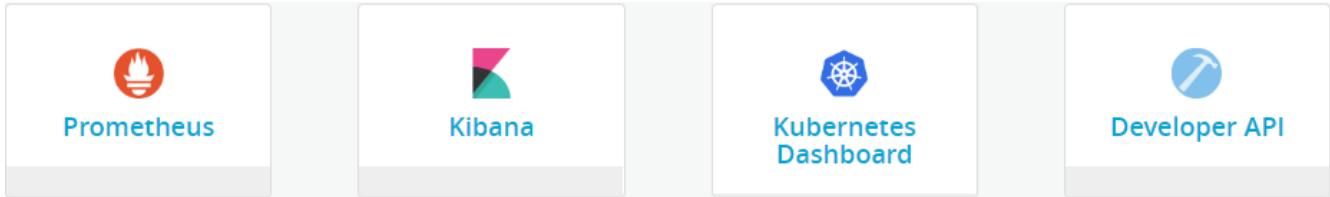
Use the DevOps Portal app to access third-party monitoring and management tools.

DevOps Portal (For Mesos/Marathon cluster)



- Marathon: Monitor VOS Cloud-Native Software applications.
- Mesos: Cloud-wide/datacenter-wide resource management and scheduling.
- Prometheus: View VOS node performance visualizations.
- Developer API: The Developer API provides access to a number of advanced Restful API calls.
- Kibana: Access the debug log, Origin server statistics, stream processing metrics, and the NGINX logs.

DevOps Portal (For Kubernetes cluster)



- Prometheus: View VOS node performance visualizations.
- Kibana: Access the debug log, Origin server statistics, stream processing metrics, and the NGINX logs.
- Kubernetes Dashboard: Monitor VOS Cloud-Native Software applications.
- Developer API: The Developer API provides access to a number of advanced Restful API calls.

Developer API

Configure or upgrade system components with the Developer API from the DevOps Portal app.

The Developer API provides access to a number of advanced Restful API calls.

Developer API

The screenshot shows the Harmonic VOS Developer API interface. At the top, there is a navigation bar with a play button icon, the text "Harmonic VOS Developer API", and input fields for "username" and "password". Below the navigation bar, there is a section titled "VOS" which contains a list of system components and their operations:

Component	Action	Action	Action
Akamai Provider [Deprecated]	Show/Hide	List Operations	Expand Operations
Akamai Provider Alert	Show/Hide	List Operations	Expand Operations
Akamai Provider Credential	Show/Hide	List Operations	Expand Operations
Akamai Provider From-Live	Show/Hide	List Operations	Expand Operations
Akamai Provider Live	Show/Hide	List Operations	Expand Operations
Akamai Provider Utils <Adaptive-Media-Delivery>	Show/Hide	List Operations	Expand Operations
Akamai Provider Utils <HLS/DASH>	Show/Hide	List Operations	Expand Operations
Akamai Provider Utils <Smooth-Streaming>	Show/Hide	List Operations	Expand Operations
Akamai Provider Utils <SecureHD-Policy-Editor>	Show/Hide	List Operations	Expand Operations
App Bundle	Show/Hide	List Operations	Expand Operations
App	Show/Hide	List Operations	Expand Operations
Asset Acquisition	Show/Hide	List Operations	Expand Operations
ATM	Show/Hide	List Operations	Expand Operations
BackupRestore	Show/Hide	List Operations	Expand Operations

Mesos

Monitor nodes, clusters, and cluster resources with Mesos from the DevOps Portal app. This is used for the Mesos/Marathon cluster only.

Cluster monitoring in Mesos

The screenshot shows the Mesos Cluster Monitoring interface. On the left, there's a sidebar with cluster information (Leader: Unknown, Version: 1.4.2, Built: 5 months ago by centos, Started: 3 weeks ago, Elected: 3 weeks ago) and a LOG section for Agents (Activated: 3, Deactivated: 0, Unreachable: 0). The main area is titled "Active Tasks" and contains a table with columns: Framework ID, Task ID, Task Name, Role, State, Started, Host, and a "Find..." search bar. The table lists several tasks, including "stream-processing-who2-1", "monitoring-18c31ded-7eb6-44e1-a409-432949f995fa", "discovery-95ee8eba-ad07-4893-956e-47818d8224b1", "origin-engine-media-delivery-server-d24effca-a497-11e9-a71e-0242ce3e49d9", and "origin-engine-asset-operator-3059666-a487-11e9-47f2-9c3d-cf3de06bc20-0011". All tasks are listed as RUNNING.

Active Tasks						
Framework ID	Task ID	Task Name	Role	State	Started	Host
0f82e60e-84ba-47f2-9c3d-cf3de06bc20-0012	f83a169c-078f-2491-f337-5323e0b0d4c5-1.10c08354	stream-processing-who2-1	*	RUNNING	2 weeks ago	vos2100-10.hilt.local
0f82e60e-84ba-47f2-9c3d-cf3de06bc20-0011	18c31ded-7eb6-44e1-a409-432949f995fa	monitoring-18c31ded-7eb6-44e1-a409-432949f995fa	*	RUNNING	2 weeks ago	vos2100-13.hilt.local
0f82e60e-84ba-47f2-9c3d-cf3de06bc20-0011	95ee8eba-ad07-4893-956e-47818d8224b1	discovery-95ee8eba-ad07-4893-956e-47818d8224b1	*	RUNNING	2 weeks ago	vos2100-12
0f82e60e-84ba-47f2-9c3d-cf3de06bc20-0001	origin-engine-media-delivery-server-d24effca-a497-11e9-a71e-0242ce3e49d9	origin-engine-media-delivery-server	middlewares	RUNNING	2 weeks ago	vos2100-12
0f82e60e-84ba-47f2-9c3d-cf3de06bc20-0001	origin-engine-media-delivery-server-81785d49-a487-11e9-a71e-0242ce3e49d9	origin-engine-media-delivery-server	middlewares	RUNNING	2 weeks ago	vos2100-10.hilt.local
0f82e60e-84ba-47f2-9c3d-cf3de06bc20-0001	origin-engine-asset-operator-3059666-a487-11e9-47f2-9c3d-cf3de06bc20-0011	origin-engine-asset-operator	middlewares	RUNNING	2 weeks ago	vos2100-13.hilt.local

- Monitoring tasks with Mesos
- Verifying service activation with Mesos
- Monitoring service activation with Mesos
- Identifying redundant streams in Mesos
- Monitoring cluster nodes with Mesos

Monitoring tasks with Mesos

Filter tasks to monitor them based on the task name.

- Active Tasks** displays the current state of a task, as well as the date and time the task started.
- Completed Task** displays tasks that have finished or were killed (i.e. quit unexpectedly).

Monitoring tasks with Mesos

Active Tasks				
ID	Name	State	Started	Host
mesos-dns.d87f0e22-ee6d-11e6-a358-9659cdf1d774	mesos-dns	RUNNING	a month ago	vos-node-02b
vos-reverse-proxy.d87f15c44-ee6d-11e6-a358-9659cdf1d774	vos-reverse-proxy	RUNNING	a month ago	vos-node-02b
middlewares-logs-shipper.d87f3533-ee6d-11e6-a358-9659cdf1d774	middlewares-logs-shipper	RUNNING	a month ago	vos-node-02b

Completed Tasks

Completed Tasks					
ID	Name	State	Started	Stopped	Host
1e42b096-e14e-e559-61da-4b4d1436d75c-1	stream-processing-HarmonicTV-Multiscreens Silver SD-HarmonicTV-1	FINISHED	5 minutes ago	just now	vos-node-02b

Verifying service activation with Mesos

You will need the service name to verify that it has been activated.

1. From the DevOps Portal app, click **Mesos**.
2. From the Mesos home page, in the **Active Tasks** Filter field, type stream and then press **Enter**.
3. From the **Active Tasks** table, look for stream processing tasks that include a service name.

Example: stream-processing-WS2src-Multiscreens SD-WS2dest-1

Monitoring service activation with Mesos

Monitor the activation of an existing service with Mesos.

The Completed Tasks table is used to monitor deactivation of a service.

Monitoring service activation with Mesos

Active Tasks					Find...
ID	Name	State	Started ▾	Host	
1e42b096-e14e-e559-61da-4b4d1436d75c-1	stream-processing-HarmonicTV-Multiscreens Silver SD-HarmonicTV-1	RUNNING	just now	vos-node-02b	Sandbox
mesos-dns.d87f0e22-ee6d-11e6-a358-9659cdf1d774	mesos-dns	RUNNING	a month ago	vos-node-02b	Sandbox
vos-reverse-proxy.d87f5c44-ee6d-11e6-a358-9659cdf1d774	vos-reverse-proxy	RUNNING	a month ago	vos-node-02b	Sandbox
middlewares-logs-shipper.d87f3533-ee6d-11e6-a358-9659cdf1d774	middlewares-logs-shipper	RUNNING	a month ago	vos-node-02b	Sandbox
origin-engine.media-delivery-server.d40322f1-ee6d-11e6-a358-9659cdf1d774	origin-engine.media-delivery-server	RUNNING	a month ago	vos-node-02b	Sandbox
elasticsearch.d1052530-ee6d-11e6-a358-9659cdf1d774	elasticsearch	RUNNING	a month ago	vos-node-02b	Sandbox

Identifying redundant streams in Mesos

If you have configured service-level redundancy using paired CloudLink instances, you can monitor the status of both streams in Mesos.

1. From the DevOps Portal app, click **Mesos**.
2. In the **Search** field, type stream.

Result: The **Active Tasks** list appears. In the **Name** column, redundant streams will have the same name with a -1 or -2 appended to the end of the name.

Info

While both streams are active, output from the backup stream is suppressed unless a failover occurs.

Monitoring cluster nodes with Mesos

Monitor your active cluster nodes with Mesos.

- Click **Agents** to display the status of your cluster nodes.
- Mesos displays each of your active nodes.

- Lost nodes are not displayed

Cluster monitoring in Mesos

ID	Host	CPU (Allocated / Total)	GPUs (Allocated / Total)	Mem (Allocated / Total)	Disk (Allocated / Total)	Registered	Re-Registered
a713-13926150000d-S0	vos-node-03b	0.97 / 8	0 / 0	2.0 GB / 13.7 GB	20 MB / 95.0 GB	2 weeks ago	
a713-13926150000d-S7	vos-node-02a	1.93 / 8	0 / 0	9.4 GB / 13.7 GB	30 MB / 95.0 GB	2 weeks ago	
a713-13926150000d-S6	vos-node-03c	6.08 / 8	0 / 0	8.2 GB / 13.7 GB	40 MB / 95.0 GB	2 weeks ago	
a713-13926150000d-S5	vos-node-03a	2.02 / 8	0 / 0	12.6 GB / 13.7 GB	30 MB / 95.0 GB	2 weeks ago	
a713-13926150000d-S4	vos-node-02c	1.18 / 8	0 / 0	8.7 GB / 13.7 GB	40 MB / 95.0 GB	2 weeks ago	yesterday
a713-13926150000d-S3	vos-node-01b	1.97 / 8	0 / 0	12.1 GB / 13.7 GB	20 MB / 95.0 GB	2 weeks ago	2 weeks ago
a713-13926150000d-S2	vos-node-02b	2.22 / 8	0 / 0	13.3 GB / 13.7 GB	50 MB / 95.0 GB	2 weeks ago	2 weeks ago
a713-13926150000d-S1	vos-node-01a	7.12 / 8	0 / 0	13.1 GB / 13.7 GB	60 MB / 95.0 GB	2 weeks ago	2 weeks ago
a713-13926150000d-S0	vos-node-01c	3.02 / 8	0 / 0	8.0 GB / 13.7 GB	30 MB / 95.0 GB	2 weeks ago	2 weeks ago

Marathon

Start, monitor, and reallocate resources for tasks in a cluster with Marathon from the DevOps Portal app. This is used for the Mesos/Marathon cluster only.

- Starts, monitors, and reallocates resources for tasks running in the cluster.
- Tasks may run in one or more instances

Cluster monitoring in Marathon

Name	CPU	Memory	Status	Running Instances	Health
atm.atm-server	0.2	512 MB	Running	2 of 2	...
dcos.ui	0.0	100 MB	Running	1 of 1	...
elasticsearch	0.3	13 GB	Waiting	4 of 5	...
esam.pois	0.3	512 MB	Running	1 of 1	...
kibana-n-logstash	0.1	2 GB	Running	1 of 1	...
logstash-tester-log4cxx	0.0	0 B	Suspended	0 of 0	...
logstash-tester-log4j	0.0	0 B	Suspended	0 of 0	...
mesos-dns	0.1	640 MB	Waiting	4 of 5	...
middlewares-logs-shipper	0.1	160 MB	Waiting	4 of 5	...
origin-engine.asset-operator	0.1	512 MB	Running	1 of 1	...

Displaying task information in Marathon

View detailed task information with Marathon from the DevOps Portal.

- From the DevOps Portal, click **Marathon**.
 - From the Marathon home page, click the task name.
- Result:** The detailed task information displays.

Prometheus

Monitor VOS node metrics with Prometheus from the DevOps Portal app.

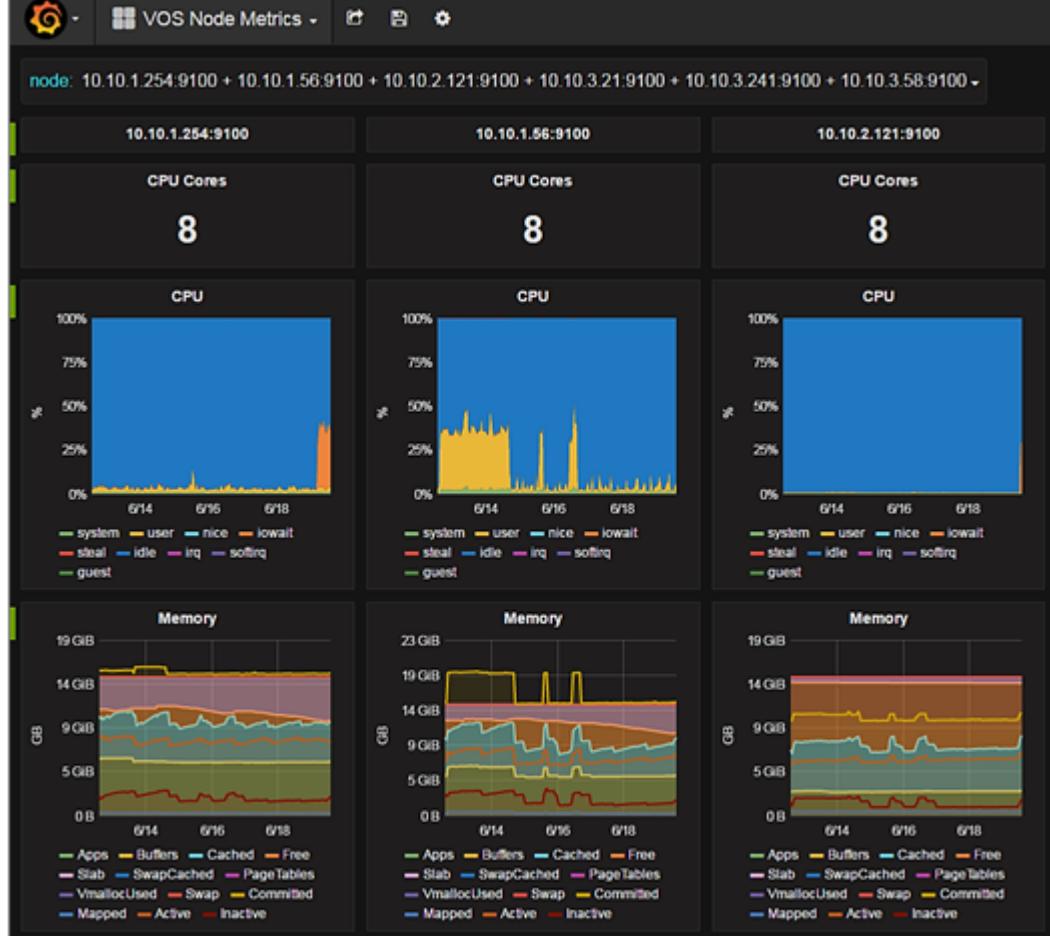
- [Viewing VOS node metrics in Prometheus](#)

Viewing VOS node metrics in Prometheus

View VOS node metrics using Prometheus.

- From the DevOps Portal app, click **Prometheus**.
- From the Prometheus home page, click **Home**.
 - For the Mesos/Marathon cluster, select **VOS Node Metrics**.

VOS node metrics in Prometheus (Mesos/Marathon deployment)



- b. For the Kubernetes cluster, select **Kubernetes / Nodes**.

VOS node metrics in Prometheus (Kubernetes deployment)

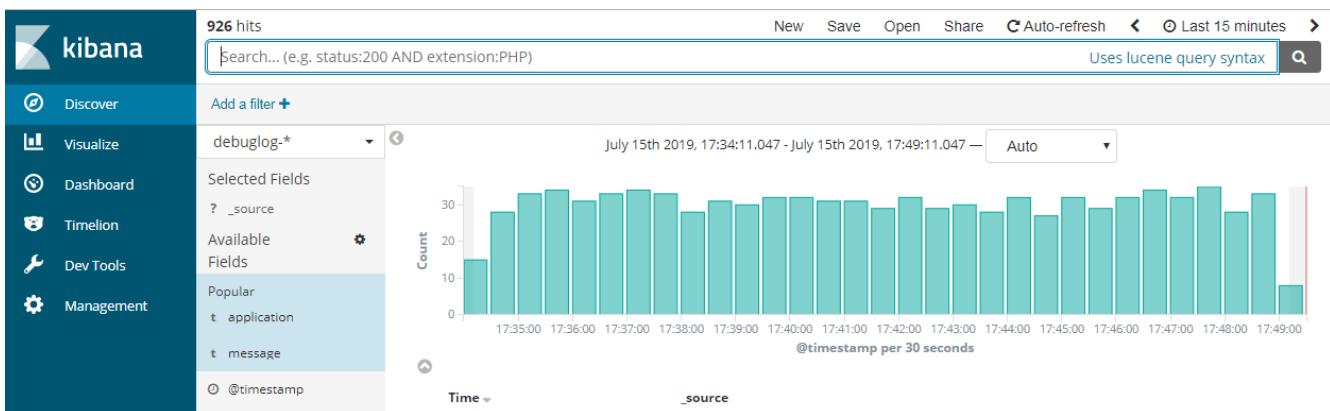


3. Select the nodes you want to view.

Kibana

View graph log data on bitrates and other stream data with Kibana from the DevOps Portal app.

Kibana navigation



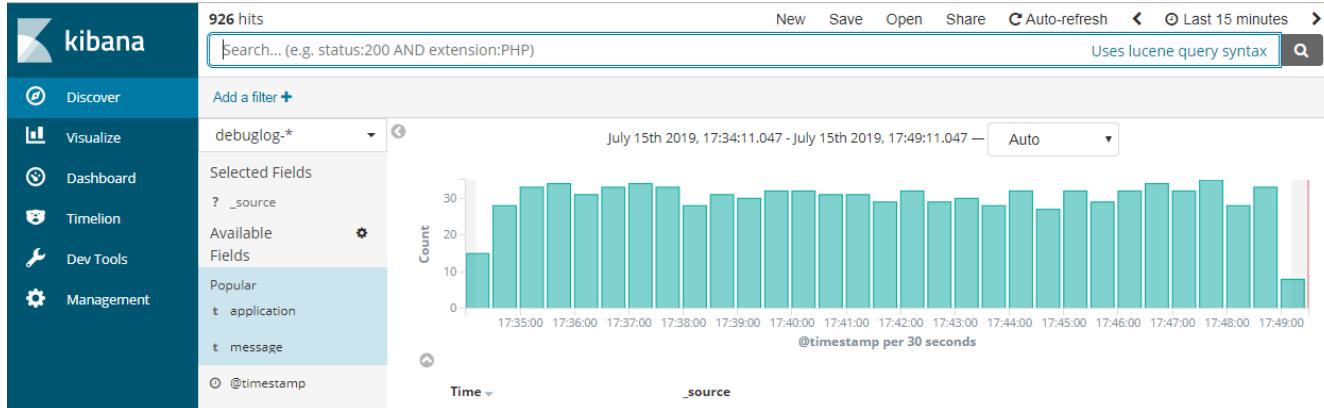
- Generating log reports with Kibana
- Querying a log with Kibana

Generating log reports with Kibana

View, graph, and generate log data with Kibana.

Log information is sent to the elastic search engine and filters are available to search on log events. You can select to view your desired log.

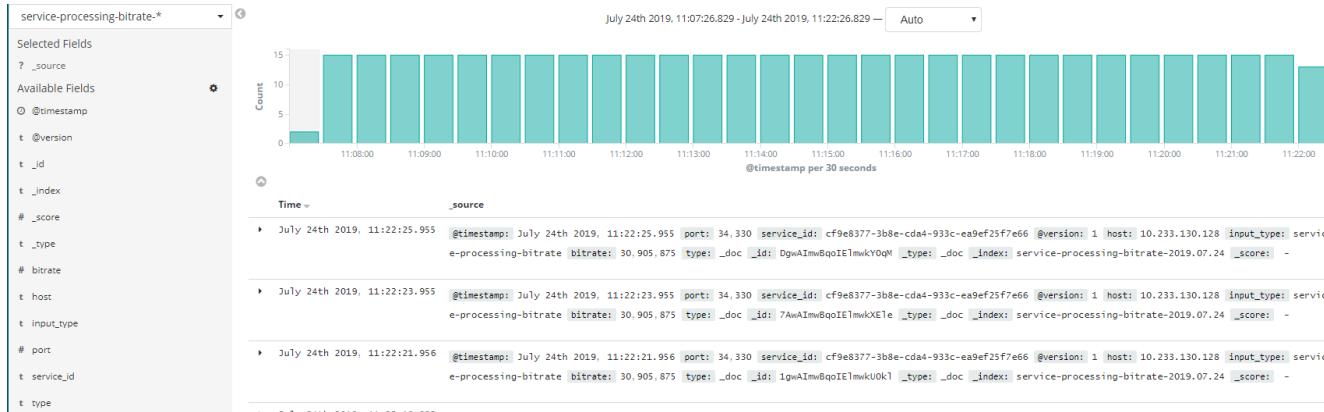
Kibana log information



You can select log metrics for graphical display.

- Log records are expandable to provide more detailed information.
- Bitrates and other stream metrics can also be displayed.

Kibana service processing bitrate metrics

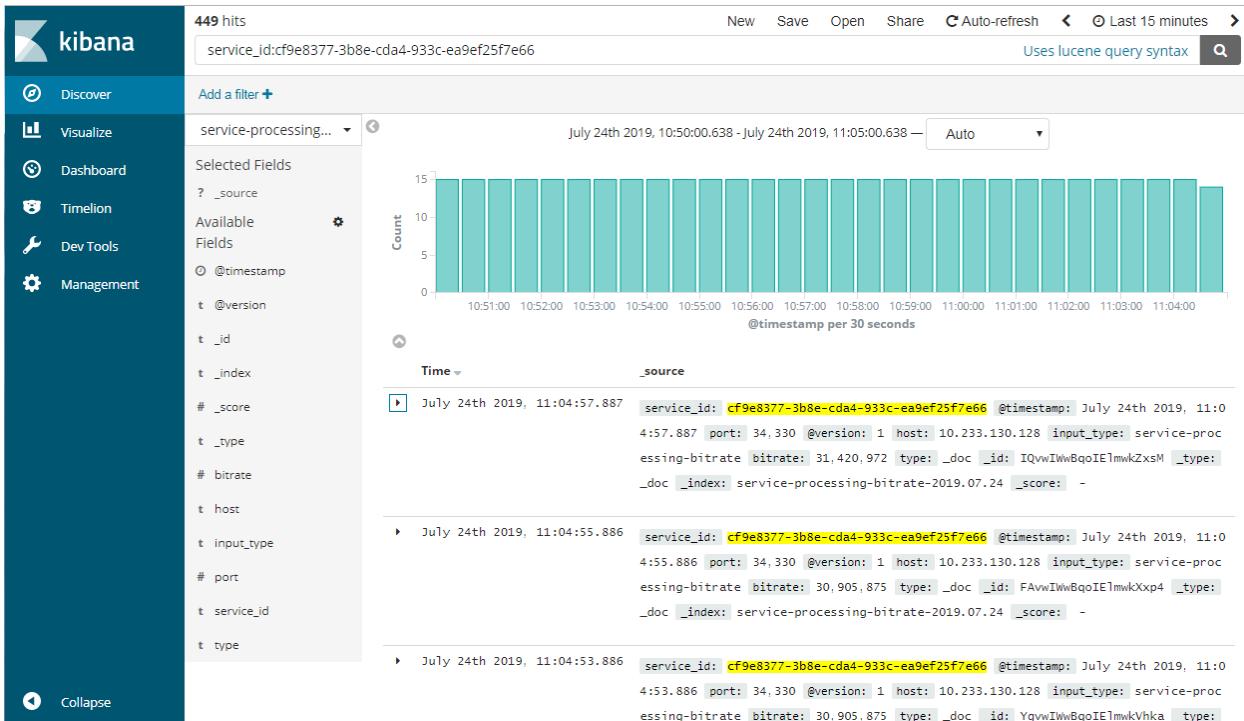


Querying a log with Kibana

Query logs in Kabana by copying and pasting the Service ID.

1. From the DevOps Portal app, click **Kibana**.
2. From the Kibana home page, click the **Index Pattern** list and then click **service-processing-bitrate-***.
3. From the **Document Table**, select a **Service ID** and **Value pair**, right-click the selected area, and then click **Copy**.

Select `service_id`



4. Select any data currently in the **Query Bar** and then press **Delete**.
 5. Right-click the **Query Bar**, click **Paste** to paste in the copied service ID, and then press **Enter**.
- Result:** From the Document Table, verify the search results.

Managing notifications

View, filter, or forward alerts and schedule dates and times to resolve notifications from the Notifications app.

1. From **Notifications**, click a category or enter a search term to find the type of notifications you want to view.

Urgent	Notifications that are labeled as Critical or Warning .
Scheduled	Notifications you have scheduled or acknowledged but not yet fixed.
Important	Notifications that have a lower severity level than those marked as Critical or Warning .
Resolved	Notifications that you have fixed.
All	A complete list of all notifications.

2. Click a single notification to view it.
3. Choose when to address the notification.
 - Click **Acknowledge (10 Min Snooze)** to schedule the fix for ten minutes from the current time.

- Click **Schedule fix** to assign a date and time for the fix and to enter any additional information. When you are finished, click **Schedule It**. At the scheduled time, the system will check to see if the problem has been fixed. If so, the notification will be marked **Resolved**. If not, the notification reappears in Notifications.

- [Retrieving notifications with the Public API app](#)
- [Configuring notifications](#)
- [Forwarding notifications](#)
- [Forwarding notification alerts to email addresses or SNMP](#)
- [Turning off notification forwarding](#)

Retrieving notifications with the Public API app

Use the Public API app to search the system log for older notification entries.

Notification activities are recorded in the system log and are available for more than the 7-day (168-hour) limit in the Notifications app. The Public API app has additional searching and filtering capabilities and download log entries.

- From System, go to **Public API > Logs > Get Logs**.
- Under **Parameters**, enter your search terms in the appropriate fields and then click **Try It Out!**. The **Public API** app uses Lucene Query Syntax.

ID	Unique notification ID ID:"AVwbFHax1zyG5V0zWLm0"
Time	Universal Time Coordinate (UTC) time when the entry was logged. Enter in the Start_Time and End_Time fields. 2017-03-26T21:11:06.171Z
Severity	Event urgency: Critical, Warning, Important
Originator	System responsible for generating the log entry. Use in the Search field to limit the returned data to notification entries. Originator:"Notifications"
Message	The notification title. It is not possible to search notification text. Message:"CloudLinks down"

Result: Notification information appears under **Response Body**.

Configuring notifications

- From the Notifications app, go to **Settings > Advanced**.
- Adjust the notification settings and click **Save**.

Window	The amount of time that notifications remain in the Notifications app.
Acknowledge Time	The amount of time the system delays a reminder after a notification has been acknowledged.
Event	<p>Select from the drop-down list to display the level of urgency assigned to the corresponding VOS events. The choices are Warning, Critical, Important and Mute. Events with an urgency level of Mute are recorded in the log but do not appear in Notifications. To mute a notification, do the following:</p> <ul style="list-style-type: none"> a. In the Urgency column, click on the VOS event you want to change. b. Select Mute from the options in the drop-down menu. <p>To unmute a notification, do the following:</p> <ul style="list-style-type: none"> a. Select Mute from the Events drop-down menu. b. Scroll to locate the event you want to change. c. Click Mute the Urgency column to open the drop-down menu, and select the urgency level you want to use.
External Events	The status of a text-only notifications feed. Choices are On and Off .

Forwarding notifications

Configure VOS Cloud-Native Software to recognize your organization's internal server or a publicly-accessible SMTP service like Gmail, which can then be used to forward notifications.

1. From the Notifications app, click **Settings**.
2. From the **General** tab, enter the required information for SMTP service.

Host	The fully qualified domain name of the SMTP server. For example, vos-server.harmonicinc.com.
Port	The port number for the SMTP server.
Username	The username for an account authorized to send email from the SMTP server.

Password	The password for the account authorized to send email from the SMTP server.
Email	<p>The return address to use for notification alerts. For example, vos_notifications@harmonicinc.com.</p> <div style="border: 1px solid #fca; padding: 10px; margin-top: 10px;"> <p>⚠ Note</p> <p>If you are using a publicly-accessible SMTP service like Gmail, do not enter your Google account password here. Instead, create an app password that gives VOS Cloud-Native Software permission to access your Google Account. Continue to the next step.</p> </div>

3. For Gmail: Authorize VOS Cloud-Native Software the first time you use it to sign in to your Google Account by generating and entering an App password.
 - a. From your Google Account, go to **Sign-in & Security > Signing in to Google > App Passwords**.
 - b. Enter your Google Account password to verify your identity.
 - c. Click the **Select app** drop-down arrow, select **Other (custom name)**, and then enter a custom name for VOS Cloud-Native Software.
 - d. Click **Generate**.

Result: Google generates a 16-character password.

 - e. Copy the 16-character password, then return to the Notifications app and paste the password into the **Email** field.

Forwarding notification alerts to email addresses or SNMP

Configure VOS Cloud-Native Software to send a notification alert when particular events occur on your system. Recipients do not need a VOS user account in order to receive these notifications.

When you set up email forwarding for notifications, messages are sent for the following events:

- New notification is issued.
- Update to an active notification.
- Resolution of an active notification.
- Scheduled fix for an active notification.
- Scheduled fix time for an active notification expires.

1. From the Notifications app, click **Settings**.
2. From the **General** tab, click the **Add New Notify Address** button .
3. Click the **Notify By** arrow and choose where to forward the notification messages.
 - For **Email**, enter an individual email address.
 - For **SNMP**, enter an SNMP IP address and community name.
4. Select the **Enabled** check box next to each recipient.

 **Info**

When you clear this check box, notification messages are temporarily turned off for the recipient.

5. Click **Send sample mail** to deliver a test message to the recipients.

Turning off notification forwarding

Permanently disable notification forwarding for an email address, SNMP community, or your organization's internal server or a publicly-accessible SMTP service like Gmail.

To disable notification forwarding for an SMTP Server you must remove all the users and SMTP communities assigned to receive forwarded notifications. Clearing the SMTP Server settings does not disable notification forwarding.

1. From the Notifications app, click **Settings**.
2. From the **General** tab, click the **Remove** button (X) next to the name of the user or community that will no longer receive forwarded notifications.

VOS notifications list

Notification title	Severity	ID	Recommendations	Note
302M audio backup source is active	WARNING	Harmonic_RmpController_302M BackupStreamSourceActive		Added to v1.23
<title>	CRITICAL	TMD_EVENTS_GAP	N.A.	Added to v1.16
<title> input activated	IMPORTANT	Harmonic_RmpController_InputActivated	N.A.	
A CloudLink down for <uplinkGroupName>	WARNING	vos.uplink.hub.uplink.group.down	Please check healthiness of uplink Group Name.	

Notification title	Severity	ID	Recommendations	Note
Adaptive-Media-Delivery configuration error	CRITICAL	com.harmonicinc.vos.akamaiprovider.amd.configuration.error	Please check the debug log for more information and try again later.	
Adaptive-Media-Delivery security settings error	CRITICAL	com.harmonicinc.vos.akamaiprovider.amd.security.settings.error	Please check the debug log for more information and try again later.	
Akamai Adaptive-Media-Delivery API credential invalid	CRITICAL	com.harmonicinc.vos.akamaiprovider.amd.unauthorized	Cannot be authenticated by Akamai OPEN API, please check your Adaptive-Media-Delivery API credential.	
Akamai HLS/DASH API credential invalid	CRITICAL	com.harmonicinc.vos.akamaiprovider.hlsdash.unauthorized	Cannot be authenticated by Akamai HDLive API, please check your Akamai Connector credential.	
Akamai Luna Center credential invalid	CRITICAL	com.harmonicinc.vos.akamaiprovider.connector.unauthorized	Cannot login Akamai, please check your Akamai Connector credential.	
Akamai Luna Center maintenance	WARNING	com.harmonicinc.vos.akamaiprovider.connector.maintenance	Please check https://control.akamai.com/acs/maintenance.html for more information.	
An unknown table generator is trying to connect	CRITICAL	Harmonic_RmpController_TriveniUnknownClient	N.A.	Added to v1.17
ARIB B39 VANC signal is not present on the baseband input	WARNING	Harmonic_AribB39SignalLost	Please check the source.	

Notification title	Severity	ID	Recommendations	Note
ASI clock warning	WARNING	Harmonic_RmpController_AsiClockWarning	N.A.	Added to v1.14
ASI output error	CRITICAL	Harmonic_RmpController_AsiOutputError	N.A.	Added to v1.14
Asset download failed	WARNING	a8ccb477-50b1-42a5-a720-79a0727d6ba3	Please check the permission or the URL setting of the download asset for stream generator.	
Asset is invalid: <sourceName>	WARNING	Harmonic_PlayoutAssetInvalid	Fix the issue with the asset, and delete the invalid asset from the Asset Acquisition Library.	
Asset is missing: <sourceName>	WARNING	Harmonic_PlayoutMissingAsset	Please check the asset.	
Asset is not compatible with channel: <sourceName>	WARNING	Harmonic_PlayoutPrimaryIncompatible	Please check the asset parameters (e.g. frame rate).	
Asset storage not available	CRITICAL	Harmonic-Origin_PrimaryStorageUnavailable	N.A.	Added to v1.18
Asset will not be available at event start time, asset: <sourceName>	WARNING	Harmonic_RecordStartTime	N.A.	Added to v1.24

Notification title	Severity	ID	Recommendations	Note
ATM container exited and restarted	IMPORTANT	ATM.ContainerCrash	<p>For Mesos deployment, ATM task <mesos_task_id> exited and restarted with a new task.</p> <p>For Kubernetes deployment, ATM task <k8s_pod_id> exited and restarted with a new task.</p>	
ATM CPU throttling detected	WARNING	Harmonic_Prometheus_Alert_WARNING	N.A.	Added to v1.24
ATM process inside container exited and restarted	IMPORTANT	ATM.ProcessCrash	<p>For Mesos environment, ATM process inside container <mesos_task_id> exited and restarted.</p> <p>For Kubernetes deployment, ATM process inside container <k8s_pod_id> exited and restarted.</p>	
ATM task is failed to update PMM nginx config map	CRITICAL	ATM_updateConfigMapFailure	N.A.	Added to v1.17
ATM task is pending in Kubernetes	CRITICAL	ATM_CannotLaunch_K8S	<p>Total <number_of_failed_atm_pod> ATM task cannot be launched.</p> <p>Please check the configuration in Kubernetes, possibly due to insufficient resources.</p> <p>Notification will be resolved once the ATM task can be launched.</p>	

Notification title	Severity	ID	Recommendations	Note
ATM task is waiting in Marathon	CRITICAL	ATM_CannotLaunch_MESOS	<p>Total <number_of_failed_atm_task> ATM task cannot be launched.</p> <p>Please check the configuration in Marathon, possibly due to insufficient resources.</p> <p>Notification will be resolved once the ATM task can be launched.</p>	
Audio Bitrate Not Supported	WARNING	Harmonic_RmpController_AudioBitrateError	N.A.	Added to v1.24
Audio Bitrate Not Supported	CRITICAL	Harmonic_RmpController_AudioOutputError	N.A.	Added to v1.24
Audio From Pair Lost	WARNING	Harmonic_RmpController_AudioFromPairLost	Check if the input source is healthy.	
Audio Property Change	WARNING	Harmonic_RmpController_AudioPropertiesChanged	The alarm is asserted when certain properties of the input audio is different from when the service started. Please check the alarm details and see if the change is expected (e.g. channel mode change). The alarm should be remitted when there's no more difference from service start.	
Audio Silence detected	WARNING	Harmonic_RmpController_AudioSilenceDetection	Please check the corresponding source or configuration.	

Notification title	Severity	ID	Recommendations	Note
Autoscaler config incorrect	WARNING	Harmonic_Origin_AutoscalerIncorrectConfig	N.A.	Added to v1.19
Backup asset storage not available	WARNING	Harmonic_Origin_BackupStorageUnavailable	N.A.	Added to v1.18
Backup Audio Stream Active	WARNING	Harmonic_RmpController_BackupStreamSourceActive	Please check the corresponding source or configuration.	
Backup publishing point is used	CRITICAL	Harmonic_RmpController_DestinationChangedIndication	Please check the primary publishing point.	
Backup source is available to be switched to	WARNING	Harmonic_RmpController_BackupSourceIsHealthy	N.A.	Added to v1.17
BBIP input packet is received but frame cannot be decoded	WARNING	Harmonic_RmpController_SdiNetInvalidStreamError	Please check the input source and the network.	
BBIP Input Packet Loss	WARNING	Harmonic_RmpController_SdiNetCcError	Please check the input source and the network.	
Blackout option is not configured	WARNING	Harmonic_PlayoutBlackoutNotConfigured	The service shares the same playout with other services which have the blackout option configured.	

Notification title	Severity	ID	Recommendations	Note
CAM input bitrate out of range	CRITICAL	Harmonic_RmpController_DemuxCamInputBitrateOutOfRange	N.A.	Added to v1.2.5.1
CAM packet loss	CRITICAL	Harmonic_RmpController_DemuxCamPacketLoss	N.A.	Added to v1.2.5.1
Cannot assign ingest point to live ingest origin server	CRITICAL	Harmonic_LiveIngestOrigin_LiveIngestPointAllocationFailure	Review ingest point setting.	
Cannot descramble input stream	CRITICAL	Harmonic_RmpController_CassandraConnectionFailure	N.A.	Added to v1.1.4
Cannot Obtain S3 AssumeRole Credentials	CRITICAL	Harmonic_Origin_CannotObtainS3AssumeRoleCredentials	N.A.	Added to v1.2.0
Capture file update failed	WARNING	e4dff96d-3013-457a-a53db555b5b27379	Please check the permission or the URL setting of the download capture for stream generator.	
Capture replay failed	WARNING	da4ef21f-0ba0-4450-9352-36110c1b9cfe	Please check the format / correctness of the capture file.	
CAS not ready	CRITICAL	vos.simulcrypt.synchronizer.cas.notready	Fix what is wrong with configured ECMGs. Configure another ECMG.	

Notification title	Severity	ID	Recommendations	Note
CAS overloaded	CRITICAL	vos.simulcrypt.synchronizer.cas.overloaded	Modify resource management on configured ECMGs Configure another ECMG.	
Channel: <channelName>	IMPORTANT	Harmonic_ReloadSchedule	Please check the resulting playlist.	
Chyro Authenticate Error - Cannot get auth token from chyro url.	CRITICAL	Harmonic_ChyroAuthError	N.A.	
Chyro Web Socket Disconnect - Connection error with chyro web socket url.	CRITICAL	Harmonic_ChyroWSDisconnect	N.A.	
Circular buffer loss	CRITICAL	Harmonic_RmpController_IndexingFailureIndication	Circular buffer loss. Failed to write to asset storage.	
CloudLinks down for <uplinkGroupName>	CRITICAL	vos.uplink.hub.uplinks.group.down	Please check the healthiness of CloudLinks for uplink Group Name.	
Cloud source unavailable	CRITICAL	Harmonic_RmpController_CloudSourceUnavailableIndication	N.A.	Added to v1.1.6
Codec Changed	WARNING	Harmonic_RmpController_CodecChanged	The alarm is asserted when the codec of the input audio/video is different from when the service started. Please check the alarm details and see if the change is expected. The alarm should be remitted when the codec is the same as service start.	

Notification title	Severity	ID	Recommendations	Note
Configured CP duration is lower than minimum supported by ECMG for CAS system	WARNING	vos.simulcrypt.synchronizer.ecmg.cpdurationtoolow	Configure longer CP duration. Remove this ECMG from configuration.	
Configuration warning - WebM Video Slate add on activated without matching LabWizard configuration	WARNING	Harmonic_RmpController_VideoSlateInsertionConfigurationWarning	N.A.	Added to v1.23
Connection lost =(.	CRITICAL	com.harmonicinc.vos.msconnect or.connectionlost	Please check your network connection.	
Connection to Hub failed since <DisconnectStartTime>. The system will be in read only mode at <DisconnectMaxPeriod>	CRITICAL	com.harmonicinc.vos.msconnect or.nohubconnection	This instance of software is unable to check that it is correctly licensed and be aware only the Read-only mode is available after the specified period. Please allow a connection to the Harmonic Hub to clear this message, with connectivity this message will automatically clear.	
Connection to PMCP over FTP server failed	WARNING	PMCP_CONNECTION_FAILED	N.A.	Added to v1.20
Container file descriptors > 8000	WARNING	Harmonic_Prometheus_Alert_WARNING	Contact Harmonic staff.	
CPU not supported	CRITICAL	Harmonic_RmpController_SpiderUnsupportedCPUError	N.A.	Added to v1.17

Notification title	Severity	ID	Recommendations	Note
CPU usage >= 95%	CRITICAL	Harmonic_Prometheus_Alert_CRITICAL	Contact Harmonic staff.	
Custom font used is invalid. Default font is used instead	WARNING	Harmonic_RmpController_CaptionPackFontError	N.A.	Added to v1.18
Database migration failed	CRITICAL	vos.asset.acquisition.database.migration.failed	N.A.	Added to v1.24
Database Replication Out of Sync	CRITICAL	Harmonic_Prometheus_Alert_CRITICAL	Contact Harmonic staff.	
Default asset is missing: <materialName>	WARNING	Harmonic_MissingDefaultAsset	Please check the asset.	
Default RTMP PSVP Audio language not found	WARNING	Harmonic_RmpController_RtmpPsvpDefaultAudioLanguage	Please set a default audio language in audio grooming.	
Delay is detected for ST2110 input source	WARNING	Harmonic_RmpController_SdiNetDelayError	Please check the input source and the network.	Added to v1.11
desired replicas in pre-warming schedule exceed max replicas	WARNING	ATM_PreWarmReplicasExceedMaxSettings	N.A.	Added to v1.24

Notification title	Severity	ID	Recommendations	Note
desired replicas in pre-warming schedule exceed max replicas	WARNING	ESNI_PreWarmReplicasExceedMaxSettings	N.A.	Added to v1.24
desired replicas in pre-warming schedule exceed max replicas	WARNING	Mock-Ad-Server_PreWarmReplicasExceedMaxSettings	N.A.	Added to v1.24
desired replicas in pre-warming schedule exceed max replicas	WARNING	Personalized-Media-Manipulator_PreWarmReplicasExceedMaxSettings	N.A.	Added to v1.24
desired replicas in pre-warming schedule exceed max replicas	WARNING	PMM-Ad-Coordinator_PreWarmReplicasExceedMaxSettings	N.A.	Added to v1.24
desired replicas in pre-warming schedule exceed max replicas	WARNING	PMM-Ingress-Controller_PreWarmReplicasExceedMaxSettings	N.A.	Added to v1.24
desired replicas in pre-warming schedule exceed max replicas	WARNING	PMM-Usage-Reporter_PreWarmReplicasExceedMaxSettings	N.A.	Added to v1.24
desired replicas in pre-warming schedule exceed max replicas	WARNING	Variant-Channel-Manipulator_PreWarmReplicasExceedMaxSettings	N.A.	Added to v1.24
DiviTrack Pool Latency and Transcoding Latency Not Match	WARNING	Harmonic_RmpController_LatencyMismatchWarning	N.A.	Added to v1.16

Notification title	Severity	ID	Recommendations	Note
DiviTrack Pool Latency Requirement Not Matched	WARNING	Harmonic_RmpController_LatencyRequirementNotMatchedWarning	N.A.	Added to v1.20
DNS is malfunctioning	CRITICAL	Harmonic_Prometheus_Alert_CRITICAL	Please check the DNS configuration. Contact Harmonic Staff if necessary.	
DRM track type cannot be associated to a profile	WARNING	Harmonic_RmpController_DrmTrackFilterMismatch		Added to v1.12
Dummy	CRITICAL	vos.emmg.server.dummy	N.A.	Added to v1.16
Eas input missing detected	CRITICAL	Harmonic_RmpController_OutputTsProgramEasInputMissing	Please check the configuration.	Added to v1.13
EAS-NET text crawl graphics insertion failed	WARNING	Harmonic_RmpController_EasNetTextCrawlFailed	N.A.	Added to v1.25
ECMG cannot open channel for super CAS ID	CRITICAL	vos.simulcrypt.synchronizer.ecmg.incorrectsupercasid	Ensure that super CAS ID value in CAS system settings matches one provided by CAS vendor. Ensure that ECMG server is configured for correct CAS system.	

Notification title	Severity	ID	Recommendations	Note
EIT is missing in the input stream	CRITICAL	Harmonic_RmpController_EitEttRemuxNoEit	N.A.	Added to v1.21
Emergency alert audio missing	WARNING	Harmonic_RmpController_EasAudioMissing	Please check the DASDEC connection.	
Encoder get stuck and output is unavailable	CRITICAL	Harmonic_RmpController_EncoderUnhealthy	N.A.	Added to v1.17
Event duration too long for asset : <sourceName>	WARNING	Harmonic_PlayoutPrimaryDurationError	N.A.	Updated in v1.21
Event is too short	WARNING	Harmonic_PlayoutTooShortEvent	Please check and configure with correct primary event duration.	Updated in v1.21
Event Start Of Material is not compatible with asset : <sourceName>	WARNING	Harmonic_PlayoutPrimarySomError	Please check and configure with correct primary event SOM parameter.	Updated in v1.21
Error response from esam restful url end point of SSPE for Traffic ID <trafficid>.	CRITICAL	Harmonic_ErrorResponse	Please check the corresponding ESAM RESTful URL end point in SSPE.	
Esam Operation Failure.	CRITICAL	Harmonic_Esam_Error	Please check the ESAM Server status.	

Notification title	Severity	ID	Recommendations	Note
ESNI container exited and restarted	IMPORTANT	ESNI_ContainerCrash	For Mesos deployment, ESNI task <mesos_task_id> exited and restarted with a new task. For Kubernetes deployment, ESNI task <k8s_pod_id> exited and restarted with a new task.	Added to v1.1.3
ESNI CPU throttling detected	WARNING	Harmonic_Prometheus_Alert_WARNING	N.A.	Added to v1.2.4
ESNI process inside container exited and restarted	IMPORTANT	ESNI_ProcessCrash	For Mesos environment, ESNI process inside container <mesos_task_id> exited and restarted. For Kubernetes deployment, ESNI process inside container <k8s_pod_id> exited and restarted.	Added to v1.1.3
ESNI task failed to update PMM nginx config map	CRITICAL	ESNI_updateConfigMapFailure	N.A.	Added to v1.1.7
ESNI task pending in Kubernetes	CRITICAL	ESNI_CannotLaunch_K8S	Total <number_of_failed_esni_pod> ESNI task cannot be launched. Please check the configuration in Kubernetes, possibly due to insufficient resources. Notification will be resolved once the ESNI task can be launched.	Added to v1.1.3

Notification title	Severity	ID	Recommendations	Note
ESNI task is waiting in Marathon	CRITICAL	ESNI_CannotLaunch_MESOS	Total <number_of_failed_esni_task> ESNI task cannot be launched. Please check the configuration in Marathon, possibly due to insufficient resources. Notification will be resolved once the ESNI task can be launched.	Added to v1.13
External metadata lost, audio metadata is not present on the baseband input	WARNING	Harmonic_RmpController_ExernalMetadataLost	N.A.	Added to v1.23
Ads pod not triggered and skipped	IMPORTANT	Harmonic_AdPodSkipped	N.A.	Updated in v1.21
Failed to collect usage data	CRITICAL	Harmonic_UsageData_Failure_Critical	N.A.	Added to v1.15
Failed to deploy to Kubernetes	CRITICAL	ATM_DeploymentError_K8S	N.A.	Added to v1.24
Failed to deploy to Kubernetes	CRITICAL	ESNI_DeploymentError_K8S	N.A.	Added to v1.24

Notification title	Severity	ID	Recommendations	Note
Failed to deploy to Kubernetes	CRITICAL	Mock-Ad-Server_DeploymentError_K8S	N.A.	Added to v1.24
Failed to deploy to Kubernetes	CRITICAL	Personalized-Media-Manipulator_DeploymentError_K8S	N.A.	Added to v1.24
Failed to deploy to Kubernetes	CRITICAL	PMM-Ad-Coordinator_DeploymentError_K8S	N.A.	Added to v1.24
Failed to deploy to Kubernetes	CRITICAL	PMM-Ingress-Controller_DeploymentError_K8S	N.A.	Added to v1.24
Failed to deploy to Kubernetes	CRITICAL	PMM-Usage-Reporter_DeploymentError_K8S	N.A.	Added to v1.24
Failed to deploy to Kubernetes	CRITICAL	Variant-Channel-Manipulator_DeploymentError_K8S	N.A.	Added to v1.24
Failed to download font file <imageName>	CRITICAL	com.harmonic.vos.configure.font.failure	N.A.	Added to v1.17
Failed to download graphics templates	CRITICAL	com.harmonic.vos.configure.graphics.failure	Please check the graphics templates source.	

Notification title	Severity	ID	Recommendations	Note
Failed to download images <imageName>	CRITICAL	com.harmonic.vos.configure.image.failure	Please check the image source.	
Failed to download lut file <imageName>	CRITICAL	com.harmonic.vos.configure.lut.failure	N.A.	Added to v1.20
Failed to download SL HDR file <imageName>	CRITICAL	com.harmonic.vos.configure.slhd.r.failure	N.A.	Added to v1.26
Failed to get AWS token for accessing S3 bucket	CRITICAL	Harmonic_LiveExtraction_Token Failure	N.A.	Added to v1.20
Failed to get auth token for file transcoder	WARNING	vos.asset.acquisition.fpev2.auth.fail	N.A.	Added to v1.25
Failed to get zixi endpoint	CRITICAL	com.harmonicinc.vos.spe.zixiend pointgetfailure	Please check the K8S Load balancer network setting.	
Failed to launch MDS instance	CRITICAL	Harmonic_Origin_MdsInstanceNotLaunched	N.A.	Added to v1.21
Failed to pair up service for geo-redundancy	CRITICAL	Harmonic_Active_Active_Service_Fail_to_Pair_Up	Please check the geo-redundancy configuration and network connectivity.	

Notification title	Severity	ID	Recommendations	Note
Failed to report usage data	WARNING	Harmonic_UsageData_Failure_Warning	N.A.	Added to v1.15
Failed to send e-mail and maximum retry count reached	WARNING	Failed to send e-mail and maximum retry count reached	Please check the email forwarding address list for VOS notification.	
Failed to setup auto-scaling	WARNING	ATM_AutoscalingMetricsFailure_K8S	N.A.	Added to v1.14
Failed to setup auto-scaling	WARNING	ESNI_AutoscalingMetricsFailure_K8S	N.A.	Added to v1.14
Failed to setup auto-scaling	WARNING	PMM-Ingress-Controller_AutoscalingMetricsFailure_K8S	N.A.	Added to v1.24
Failed to setup auto-scaling	WARNING	Mock-Ad-Server_AutoscalingMetricsFailure_K8S	N.A.	Added to v1.15
Failed to setup auto-scaling	WARNING	Personalized-Media-Manipulator_AutoscalingMetricsFailure_K8S	N.A.	Added to v1.14
Failed to setup auto-scaling	WARNING	PMM-Ad-Coordinator_AutoscalingMetricsFailure_K8S	N.A.	Added to v1.20

Notification title	Severity	ID	Recommendations	Note
Failed to setup auto-scaling	WARNING	PMM-Usage-Reporter_AutoscalingMetricsFailure_K8S	N.A.	Added to v1.15
Failed to setup auto-scaling	WARNING	Variant-Channel-Manipulator_AutoscalingMetricsFailure_K8S	N.A.	Added to v1.20
Failed to start due to bad input	CRITICAL	Harmonic_RmpController_BadInputAtServiceStart	N.A.	Added to v1.21
Failed to touch asset storage	CRITICAL	Harmonic_Origin_AssetFolderAccess	Please check the asset storage.	
Failed to update internal proxy config	CRITICAL	Harmonic_Origin_MDSNginxConfigFailed	N.A.	Added to v1.19
Genlock lost on SDI output	WARNING	Harmonic_RmpController_GenlockStatus	N.A.	Added to v1.22.1
Geo-redundancy service cannot be synchronized	CRITICAL	Harmonic_RmpController_ActiveActive_Source_Pts_Not_Sync	N.A.	Added to v1.25.1
Geo-redundancy service(s) Input Source PTS out of sync	CRITICAL	Harmonic_RmpController_ActiveActive_Source_Pts_Not_Sync	N.A.	Added to v1.15

Notification title	Severity	ID	Recommendations	Note
Geo-redundancy source offset too large	WARNING	Harmonic_RmpController_Active_Active_Source_Not_Sync	N.A.	Added to v1.2.5.1
Geo-sync configuration checking unavailable	IMPORTANT	Harmonic_RmpController_GeoSyncConfigCheckUnavailable	N.A.	Added to v1.2.4
GPI Box is unreachable	WARNING	com.harmonicinc.vos.app.gpi.unreachable	N.A.	Added to v1.2.6
HLS Input Streams Out of Sync	WARNING	Harmonic_RmpController_HLSInputStreamsOutOfSync	N.A.	Added to v1.1.8
HLS Input Stream Unhealthy	WARNING	Harmonic_RmpController_HLSInputStreamUnhealthy	N.A.	Added to v1.1.8
HLS source <sourceName> decryption error	CRITICAL	Harmonic_RmpController_HlsDecryptionError	N.A.	Added to v1.1.7
IDR misalignment detected	WARNING	Harmonic_RmpController_PackerIDRMisalignment	Please check the input source for IDR frames synchronization. Possible causes are configured different IDR frames interval for input streams, poor connection (lead to an IDR frame lost), the poor input stream.	

Notification title	Severity	ID	Recommendations	Note
Image/graphic file(s) lost	CRITICAL	40846d91-6594-4e3a-a5d2-0eec5c349cef	N.A.	Added to v1.2.5.1
Image overlay failed	WARNING	Harmonic_RmpController_ImageOverlayErrorIndication	Please check the image setting accordingly.	
Improper configuration has been overridden	WARNING	Harmonic_RmpController_IncorrectConfigurationOverrideWarning	N.A.	Added to v1.2.0
Incoming Network Traffic threshold allowance has been exceeded	CRITICAL	Harmonic_Prometheus_Alert_CRITICAL	Please check the network traffic utilization. Contact Harmonic staff if necessary.	
Input Audio Codec Mismatch	WARNING	Harmonic_RmpController_InputAudioCodecMismatch	The alarm is asserted when the codec of the input audio is different from when the service started. Please check the alarm details and see if the change is expected. The alarm should be remitted when the codec is the same as service start.	
Input CC error	WARNING	Harmonic_RmpController_CcErrorWarning	Please check the input source and the network.	
Input content scrambled	WARNING	Harmonic_RmpController_ScramblingContentIndication	Please check the input source.	Added to v1.1.1

Notification title	Severity	ID	Recommendations	Note
Input Framerate Not Supported	WARNING	Harmonic_RmpController_InputFramerateNotSupported	N.A.	Added to v1.17
Input is scrambled	CRITICAL	Harmonic_RmpController_ProgramScrambledIndication	N.A.	Added to v1.14
Input signal loss	CRITICAL	Harmonic_RmpController_CriticalInputSignalLostIndication	Please check the configuration and network connectivity of the corresponding source.	Added to v1.22
Input signal loss	WARNING	Harmonic_RmpController_InputSignalLostIndication	Please check the configuration and network connectivity of the corresponding source.	
Input source drift detected	IMPORTANT	Harmonic_RmpController_PackerInputDriftWarning	Please check the input sources for synchronization, possibly they need to be restarted to synchronize each other.	
Input stream missing	WARNING	Harmonic_RmpController_StreamMissingIndication	Please check the configuration of the corresponding source.	
Instance just started up	WARNING	Harmonic_Prometheus_Alert_WARNING	N.A.	
Insufficient Ephemeral Storage for MDS Pods	WARNING	Harmonic_Prometheus_Alert_WARNING	N.A.	Added to v1.22

Notification title	Severity	ID	Recommendations	Note
Insufficient HLS manifest depth	WARNING	Harmonic_RmpController_HlsPlaylistDepthError	N.A.	Added to v1.2.2
Interruption in connection to the cloud - packets dropped.	CRITICAL	Harmonic_RmpController_CloudFeederPacketsDrops	Please check the network bandwidth and network connectivity.	
Invalid 302M Stream or Substream ID/Index was given	WARNING	Harmonic_RmpController_Invalid302MStreamIdWarning	N.A.	Added to v1.2.2
Invalid color space conversion	WARNING	Harmonic_RmpController_SpiderCscWarning	Please select a valid color conversion.	
Invalid conversion	WARNING	Harmonic_RmpController_SpiderCscWarning	N.A.	Added to v1.2.5
Invalid Encoding level	WARNING	Harmonic_RmpController_SpiderInvalidEncodingLevelWarning	N.A.	Added to v1.2.5
Invalid Gop Parameters. Gop Size cannot be updated	WARNING	Harmonic_RmpController_GopParameterInvalid	N.A.	Added to v1.2.5
Invalid Gop Parameters. Gop Size has been updated	WARNING	Harmonic_RmpController_GopParameterAdjusted	N.A.	Added to v1.2.4

Notification title	Severity	ID	Recommendations	Note
Invalid Registration Key.	CRITICAL	com.harmonicinc.vos.msconnect or.invalidLicenseKey	The token identifying this instance of software has been revoked. Please terminate this unlicensed copy by obtaining a new one from the Harmonic Hub (https://hub.harmonicinc.com/License) and applying it to this instance.	
Invalid Source <sourceName>	CRITICAL	Harmonic_RmpController_InvalidSourceIndication	N.A.	Added to v1.14
Kantar Snap Watermarking Failure	WARNING	Harmonic_RmpController_KantarSnapWatermarkingFailure	N.A.	Added to v1.20
KMS initialization failed	CRITICAL	Harmonic_RmpController_KmsInitializationFailure	Please check the KMS connection.	
KMS key retrieval error	CRITICAL	Harmonic_RmpController_KmsKeyRetrievalError	Please check the KMS connection.	
KMS key retrieval warning	WARNING	Harmonic_RmpController_PackerKeyRetrievalWarning	N.A.	Added to v1.20
Large timestamp jump detected	IMPORTANT	Harmonic_RmpController_PackerDetectHugeTimestampJump	N.A.	Added to v1.19
Latency Mode is Rectified	WARNING	Harmonic_RmpController_LatencyRectifiedWarning	N.A.	Added to v1.17

Notification title	Severity	ID	Recommendations	Note
Less than 6 hours Chyro schedule for Traffic ID <trafficid>.	WARNING	Harmonic_ScheduleMissing	Please consult your Chyro administrator.	
live feed cannot be preloaded: <sourceName>	WARNING	Harmonic_PlayoutLivePrepareFailure	N.A.	Added to v1.2.1
Liveness probe failed	IMPORTANT	com.harmonicinc.vos.spe.livenessfailed	N.A.	Added to v1.2.2
Live source is missing: <sourceName>	WARNING	Harmonic_PlayoutMissingLiveSource	Please check the live source.	
Live source preparation failure: <sourceName>	WARNING	Harmonic_PlayoutPrepareIssue	Please check that the live source is present and not already in use.	
Live Transcription Drop Warning	WARNING	Harmonic_RmpController_LiveTranscriptionDropWarning	N.A.	Added to v1.2.5
Live Transcription Error	CRITICAL	Harmonic_RmpController_LiveTranscriptionError	N.A.	Added to v1.2.5
Live transcription language is not officially supported	WARNING	Harmonic_RmpController_LiveTranscriptionLanguageNotOfficiallySupportedWarning	N.A.	Added to v1.2.5

Notification title	Severity	ID	Recommendations	Note
Logo Insertion Status	WARNING	Harmonic_RmpController_LogoInsertionStatus	N.A.	
Mandatory ATSC configuration parameters are missing	CRITICAL	Harmonic_RmpController_AtsCMandatoryParameterNotPresentInGlobalSettings	N.A.	Added to v1.19
Marathon is down	CRITICAL	Harmonic_Prometheus_Alert_CRITICAL	Contact Harmonic staff for help.	
Master has turned off due to presence of HHP heartbeat from standby device	CRITICAL	Harmonic_HHPController_MasterOff	Please check the network connectivity of Master device to VOS and standby device to figure out the reason for the standby device activation.	
MDS Pods CPU throttling detected	WARNING	Harmonic_Prometheus_Alert_WARNING	N.A.	Added to v1.24
Memory consumption exceeded limit	CRITICAL	Harmonic_Prometheus_Alert_CRITICAL	Contact Harmonic staff if necessary.	
Memory usage >= 90%	CRITICAL	Harmonic_Prometheus_Alert_CRITICAL	Contact Harmonic staff.	
Mesos DNS is malfunctioning	CRITICAL	Harmonic_Prometheus_Alert_CRITICAL	Contact Harmonic staff.	
Mesos master is down	CRITICAL	Harmonic_Prometheus_Alert_CRITICAL	Contact Harmonic staff.	

Notification title	Severity	ID	Recommendations	Note
MGT is missing in the input stream	CRITICAL	Harmonic_RmpController_EitEttRemuxNoMgt	N.A.	Added to v1.21
Mock-Ad-Server container exited and restarted	IMPORTANT	Mock-Ad-Server_ContainerCrash	N.A.	Added to v1.15
Mock-Ad-Server process inside container exited and restarted	IMPORTANT	Mock-Ad-Server_ProcessCrash	N.A.	Added to v1.15
Mock-Ad-Server task is failed to update PMM nginx config map	CRITICAL	Mock-Ad-Server_updateConfigMapFailure	N.A.	Added to v1.17
Mock-Ad-Server task is pending in Kubernetes	CRITICAL	Mock-Ad-Server_CannotLaunch_K8S	N.A.	Added to v1.15
Mock-Ad-Server task is waiting in Marathon	CRITICAL	Mock-Ad-Server_CannotLaunch_MESOS	N.A.	Added to v1.15
Network capture failed	WARNING	network.capture.failed	N.A.	
NFS retransmission rate > 5%	WARNING	Harmonic_Prometheus_Alert_WARNING	Please check healthiness of NFS storage. Contact Harmonic staff if necessary.	

Notification title	Severity	ID	Recommendations	Note
NFS storage disconnected from nodes	CRITICAL	harmonicinc.vos.healthcheck.nfs.disconnected	Please check NFS status.	
Nielsen Watermark insertion failure	WARNING	Harmonic_RmpController_NielsenWatermarkFailure	Please solve the Nielsen Watermarking related issue.	
No connection to receiver.	CRITICAL	Harmonic_RmpController_Feede rLostConnection	Please check the network connection.	
No connection to the cloud.	CRITICAL	Harmonic_RmpController_Feede rCloudLostConnection	Please check the network connection.	
No EIT referred in the MGT in the input stream	CRITICAL	Harmonic_RmpController_EitEttRemuxNoEitInMgt	N.A.	Added to v1.21
No message from POIS	WARNING	Harmonic_Esam_Pois_Warning	N.A.	Added to v1.15
No PMCP file for an EIT period	WARNING	PMCP_NOEITETTFORPERIOD	N.A.	Added to v1.20
No PSIP tables received	CRITICAL	Harmonic_RmpController_TriveniNotReceiveMain	N.A.	Added to v1.17
No relevant EIT data in the PMCP files	WARNING	PMCP_FILEMATCHNONEPROGRAMS	N.A.	Added to v1.20

Notification title	Severity	ID	Recommendations	Note
No teletext in signal	WARNING	Harmonic_RmpController_SDINputMissingTeletext	N.A.	Added to v1.23
Not enough space in cache volume	WARNING	Harmonic_Origin_CacheVolumeNotEnoughSpace	N.A.	Added to v1.20
One segmentation_event_id is used for multiple active segmentation events	WARNING	Harmonic_RmpController_PackerDuplicateEventId	N.A.	Added to v1.21
Outgoing Network Traffic threshold allowance has been exceeded	CRITICAL	Harmonic_Prometheus_Alert_CRITICAL	N.A.	
Output PID is reassigned	WARNING	Harmonic_RmpController_PidReassignedWarning	N.A.	Added to v1.19
Output resolution upsampling	WARNING	Harmonic_RmpController_OutputNotAlignedWarning	Please check the input resolution and the output resolution in transcoding profile.	
Output TS Bitrate Insufficient	CRITICAL	Harmonic_RmpController_OutputTsUnderflow	Please check if the bitrate for the passthrough audio or data is enough. Otherwise, increase the overall output TS bitrate or reduce the video bitrate to avoid the problem.	

Notification title	Severity	ID	Recommendations	Note
Output TS effective bitrate is too high	CRITICAL	Harmonic_RmpController_OutputTsOverflow	Please check if the actual input TS bitrate is not higher than expected. If the input TS bitrate is expected but the output MPTS bitrate is insufficient, increase the output TS bitrate.	
Overlapping of messages with the same segmentation type is detected - not allowed by the SCTE-35 standard	WARNING	Harmonic_RmpController_PackerNonOverlappableSegmentationTypes	N.A.	Added to v1.21
Packaging output is forced to be unencrypted	WARNING	Harmonic_RmpController_PackerDrmToggled	N.A.	Added to v1.16
Playout: some past events have not been removed	WARNING	Harmonic_PlayoutPastEventsNotRemoved	N.A.	Updated in v1.21
Personalized-Media-Manipulator container exited and restarted	IMPORTANT	Personalized-Media-Manipulator_ContainerCrash	For Mesos deployment, Personalized-Media-Manipulator task <mesos_task_id> exited and restarted with a new task. For Kubernetes deployment, Personalized-Media-Manipulator task <k8s_pod_id> exited and restarted with a new task.	Added to v1.13

Notification title	Severity	ID	Recommendations	Note
Personalized-Media-Manipulator process inside container exited and restarted	IMPORTANT	Personalized-Media-Manipulator_ProcessCrash	<p>For Mesos environment, Personalized-Media-Manipulator process inside container <mesos_task_id> exited and restarted.</p> <p>For Kubernetes deployment, Personalized-Media-Manipulator process inside container <k8s_pod_id> exited and restarted.</p>	Added to v1.1.3
Personalized-Media-Manipulator task is failed to update PMM nginx config map	CRITICAL	Personalized-Media-Manipulator_updateConfigMapFailure	N.A.	Added to v1.1.7
Personalized-Media-Manipulator task is pending in Kubernetes	CRITICAL	Personalized-Media-Manipulator_CannotLaunch_K8S	<p>Total <number_of_failed_personalized_media_manipulator_pod> Personalized-Media-Manipulator task cannot be launched.</p> <p>Please check the configuration in Kubernetes, possibly due to insufficient resources.</p> <p>Notification will be resolved once the Personalized-Media-Manipulator task can be launched.</p>	Added to v1.1.3

Notification title	Severity	ID	Recommendations	Note
Personalized-Media-Manipulator task is waiting in Marathon	CRITICAL	Personalized-Media-Manipulator_CannotLaunch_ME SOS	Total <number_of_failed_personalized_media_manipulator_pod> Personalized-Media-Manipulator task cannot be launched. Please check the configuration in Marathon, possibly due to insufficient resources. Notification will be resolved once the Personalized-Media-Manipulator task can be launched.	Added to v1.1.3
Pid conflict detected	CRITICAL	Harmonic_RmpController_OutputTsPidConflict	Please resolve PID conflict by assigning output stream PID properly via the Mux Manager.	
PMM-Ad-Coordinator container exited and restarted	IMPORTANT	PMM-Ad-Coordinator_ContainerCrash	N.A.	Added to v1.2.0
PMM_Ad_Coordinator CPU throttling detected	WARNING	Harmonic_Prometheus_Alert_WARNING	N.A.	Added to v1.2.4
PMM-Ad-Coordinator process inside container exited and restarted	IMPORTANT	PMM-Ad-Coordinator_ProcessCrash	N.A.	Added to v1.2.0
PMM-Ad-Coordinator task is failed to update PMM nginx config map	CRITICAL	PMM-Ad-Coordinator_updateConfigMapFailure	N.A.	Added to v1.2.0

Notification title	Severity	ID	Recommendations	Note
PMM-Ad-Coordinator task is pending in Kubernetes	CRITICAL	PMM-Ad-Coordinator_CannotLaunch_K8S	N.A.	Added to v1.20
PMM-Ad-Coordinator task is waiting in Marathon	CRITICAL	PMM-Ad-Coordinator_CannotLaunch_ME SOS	N.A.	Added to v1.20
PMM-Ingress-Controller container exited and restarted	IMPORTANT	PMM-Ingress-Controller_ContainerCrash	N.A.	Added to v1.24
PMM-Ingress-Controller process inside container exited and restarted	IMPORTANT	PMM-Ingress-Controller_ProcessCrash	N.A.	Added to v1.24
PMM-Ingress-Controller task is failed to update PMM nginx config map	CRITICAL	PMM-Ingress-Controller_updateConfigMapFailure	N.A.	Added to v1.24
PMM-Ingress-Controller task is pending in Kubernetes	CRITICAL	PMM-Ingress-Controller_CannotLaunch_K8S	N.A.	Added to v1.24
PMM-Ingress-Controller task is waiting in Marathon	CRITICAL	PMM-Ingress-Controller_CannotLaunch_MES OS	N.A.	Added to v1.24

Notification title	Severity	ID	Recommendations	Note
PMM manipulator container CPU throttling detected	WARNING	Harmonic_Prometheus_Alert_WARNING	N.A.	Added to v1.24
PMM nginx container CPU throttling detected	WARNING	Harmonic_Prometheus_Alert_WARNING	N.A.	Added to v1.24
PMM-Usage-Reporter container exited and restarted	IMPORTANT	PMM-Usage-Reporter_ContainerCrash	N.A.	Added to v1.15
PMM-Usage-Reporter process inside container exited and restarted	IMPORTANT	PMM-Usage-Reporter_ProcessCrash	N.A.	Added to v1.15
PMM-Usage-Reporter task is failed to update PMM nginx config map	CRITICAL	PMM-Usage-Reporter_updateConfigMapFailure	N.A.	Added to v1.17
PMM-Usage-Reporter task is pending in Kubernetes	CRITICAL	PMM-Usage-Reporter_CannotLaunch_K8S	N.A.	Added to v1.15
PMM-Usage-Reporter task is waiting in Marathon	CRITICAL	PMM-Usage-Reporter_CannotLaunch_MESOS	N.A.	Added to v1.15

Notification title	Severity	ID	Recommendations	Note
Asset can not be preloaded: <sourceName>	WARNING	Harmonic_PlayoutPrepareFailure	Check that the asset is not corrupted.	Updated in v1.21
Pre-warming schedule cannot be applied	CRITICAL	Harmonic_Origin_InvalidPreWarmingSettings	N.A.	Added to v1.24
Primary event ended early, asset :<sourceName>	WARNING	Harmonic_PlayoutPlayEndedEarly	Check that the asset is not corrupted.	Updated in 1.21
Program number conflict detected	CRITICAL	Harmonic_RmpController_OutputTsProgramNumberConflict	Please resolve Program Number conflict by assigning output Program Number properly via the Mux Manager.	
Program switch command rejected	WARNING	Harmonic_RmpController_ProgramSwitchFailWarning	N.A.	Added to v1.15
Prometheus has lost heartbeat from instance	CRITICAL	Harmonic_Prometheus_Alert_CRITICAL	Contact Harmonic staff.	
PSI Change	WARNING	Harmonic_RmpController_PSIChanged	N.A.	
PSIP not allowed	CRITICAL	Harmonic_RmpController_OutputTsPsipNotAllowed	N.A.	Added to v1.17

Notification title	Severity	ID	Recommendations	Note
PSIP tables are not updated	WARNING	Harmonic_RmpController_Triveni NoMoreComm	N.A.	Added to v1.17
Push packaging connection failed	CRITICAL	Harmonic_RmpController_PublishingFailureIndication	Push packaging connection cannot be established. Possible errors are unreachable destination, incorrect credentials, unexpected CDN server response, etc.	
Rate messages for the specified Rate pool are not received.	CRITICAL	Harmonic_RmpController_StatMux_Rate_Msg_Not_Received	N.A.	
Reached the maximum number of connections to cloud source/edge used in source <sourceName>	CRITICAL	Harmonic_RmpController_SrtInp utOverloadError	N.A.	Added to v1.20
receive pre-warming schedule but auto-scaling is disabled	CRITICAL	ATM_PreWarmAutoscalingDisabled	N.A.	Added to v1.24
receive pre-warming schedule but auto-scaling is disabled	CRITICAL	ESNI_PreWarmAutoscalingDisabled	N.A.	Added to v1.24
receive pre-warming schedule but auto-scaling is disabled	CRITICAL	Mock-Ad-Server_PreWarmAutoscalingDisabled	N.A.	Added to v1.24

Notification title	Severity	ID	Recommendations	Note
receive pre-warming schedule but auto-scaling is disabled	CRITICAL	Personalized-Media-Manipulator_PreWarmAutoscalingDisabled	N.A.	Added to v1.24
receive pre-warming schedule but auto-scaling is disabled	CRITICAL	PMM-Ad-Coordinator_PreWarmAutoscalingDisabled	N.A.	Added to v1.24
receive pre-warming schedule but auto-scaling is disabled	CRITICAL	PMM-Ingress-Controller_PreWarmAutoscalingDisabled	N.A.	Added to v1.24
receive pre-warming schedule but auto-scaling is disabled	CRITICAL	PMM-Usage-Reporter_PreWarmAutoscalingDisabled	N.A.	Added to v1.24
receive pre-warming schedule but auto-scaling is disabled	CRITICAL	Variant-Channel-Manipulator_PreWarmAutoscalingDisabled	N.A.	Added to v1.24
Regional Ad Asset Missing	CRITICAL	Harmonic_Prometheus_Alert_CRITICAL	N.A.	Added to v1.20
Regional Ad Asset Missing	WARNING	Harmonic_Prometheus_Alert_WARNING	N.A.	Added to v1.20
Regional Ad Asset Unavailable	CRITICAL	Harmonic_Prometheus_Alert_CRITICAL	N.A.	Added to v1.20

Notification title	Severity	ID	Recommendations	Note
Regional Ad Asset Unavailable	WARNING	Harmonic_Prometheus_Alert_WARNING	N.A.	Added to v1.20
Replicas exceed max settings	WARNING	Harmonic_Origin_ReplicasExceedMaxSettings	N.A.	Added to v1.24
Schedule reloaded	IMPORTANT	Harmonic_ReloadSchedule	N.A.	Updated in 1.21
Rivermax license file not found	CRITICAL	Harmonic_RmpController_RivermaxLicenseMissing	N.A.	Added to v1.21
RTP Payload Type Conflict	CRITICAL	Harmonic_RmpController_InputSDiNetPayloadTypeConflictError	N.A.	Added to v1.22
S3 bucket unreachable	CRITICAL	vos.asset.acquisition.s3.notAvailable	Consult logs for details.	
S3 credentials are not valid	CRITICAL	vos.asset.acquisition.s3.notValid.Credentials	Please provide another credentials for S3 bucket.	
S3 user does not have permissions for S3 bucket	CRITICAL	vos.asset.acquisition.s3.insufficient.Permissions	Please provide another credentials for S3 bucket or change bucket policy.	
SCG cannot open ECM stream for CAS	CRITICAL	vos.simulcrypt.synchronizer.scg.noecmstream	Check if ECMGs for that CAS system are configured correctly.	

Notification title	Severity	ID	Recommendations	Note
SCG did not perform CP transitions for longer than five cryptoperiods	CRITICAL	vos.simulcrypt.synchronizer.scg.notransition	Check if ECMGs for relevant CAS systems are configured correctly. Ensure access criteria are configured correctly.	
SCG received error message instead of ECM after CW provision from CAS	CRITICAL	vos.simulcrypt.synchronizer.scg.ecmacquisitionfailure	Check if ECMGs for that CAS system are configured correctly. Ensure access criteria are configured correctly.	
Scheduler360 connection failure	CRITICAL	SCHEDULER360_CONNECTION_FAILURE	N.A.	Added to v1.16
Scheduler360 export playlist failure vosPlayoutChannelId: <vosPlayoutChannelId> additionalInfo: <additionalInfo>	IMPORTANT	SCHEDULER360_EXPORT_PLAYLIST_ERROR	N.A.	Added to v1.16
Scheduler360 asset synchronization failure	IMPORTANT	SCHEDULER360_ASSET_SYNCHRONIZATION_ERROR	N.A.	Added to v1.21
Scheduler360 feed synchronization failure	WARNING	SCHEDULER360_FEED_SYNC_HRONIZATION_ERROR	N.A.	Added to v1.24
Scheduler360 Okta connection failure	CRITICAL	OKTA_SERVER_CONNECTION_FAILURE	N.A.	Added to v1.16

Notification title	Severity	ID	Recommendations	Note
Scheduler360 wrong Okta credentials	CRITICAL	SCHEDULER360_AUTHENTICATION_FAILURE	N.A.	Added to v1.16
SCS started	IMPORTANT	vos.simulcrypt.synchronizer.start	N.A.	Added to v1.21
SCTE-35 CUE-OUT without duration and no SCTE-35 CUE-IN arrived within the \default auto return duration\ time	WARNING	Harmonic_RmpController_PackerNoDurationDefaultAutoReturnPassed	N.A.	Added to v1.21
SDI audio input stream is missing	WARNING	Harmonic_RmpController_SDIAudioStreamMissing	Please check the corresponding source or configuration.	
SDI Destination internal clock Warning	WARNING	Harmonic_RmpController_HWClockWarning	N.A.	Added to v1.17
SDI Destination processing Failure	CRITICAL	Harmonic_RmpController_HWStatus	N.A.	Added to v1.17
SDI Destination Failure	CRITICAL	Harmonic_RmpController_SdiDestinationHWFailure	N.A.	Added to v1.18

Notification title	Severity	ID	Recommendations	Note
SDI Destination Frame Pacing warning	WARNING	Harmonic_RmpController_DroppedFrameWarning	N.A.	Added to v1.17
SDI Destination processing Failure	CRITICAL	Harmonic_RmpController_SdiDestinationEndToEndOverflowFailure	N.A.	Added to v1.18
SDI deterministic latency failure	CRITICAL	Harmonic_RmpController_SdiLatencyError	N.A.	Added to v1.25.1
SDI deterministic latency issue	WARNING	Harmonic_RmpController_SdiLatencyWarning	N.A.	Added to v1.25.1
SDI source video format mismatch	WARNING	Harmonic_RmpController_SdiVideoFormatMismatch	N.A.	Added to v1.22
Selected RTMP PSVP Audio language not found	WARNING	Harmonic_RmpController_RtmpPsvpSelectedAudioLanguage	Please select a language that is available in audio grooming.	
Server Overload	WARNING	Harmonic_RmpController_SpiderSystemOverloadWarning	N.A.	Added to v1.14
Service <serviceName> removed by syndicate	CRITICAL	com.harmonicinc.vos.affiliate.service.unavailable	N.A.	Added to v1.16

Notification title	Severity	ID	Recommendations	Note
Service <serviceName> SRT Path sync loss	WARNING	Harmonic_RmpController_SrtInp utPathSyncLossWarning	N.A.	Added to v1.16
Service configuration failed	CRITICAL	Harmonic_RmpController_ServiceFailureIndication	Please check the configuration of the corresponding service.	
Service Configuration out-of-sync for geo-redundancy	WARNING	Harmonic_RmpController_Active_Active_Configuration_Not_Sync	N.A.	Added to v1.24
Service configuration warning	WARNING	Harmonic_RmpController_ServiceConfigurationWarning	N.A.	Added to v1.23
Service unhealthy	WARNING	Harmonic_RmpController_ServiceUnhealthyAlarm	Service output unhealthy due to insufficient processing power. Please ensure the input is not transmitting too fast review the hardware settings or reduce the transcoding profile complexity.	
Silence Insertion Enabled	WARNING	Harmonic_RmpController_SilenceInsertion	Please check the corresponding source or configuration.	
SIS absolute time reference error	CRITICAL	Harmonic_RmpController_SisPcr AbsError	N.A.	Added to v1.18
SIS DSA processing error	CRITICAL	Harmonic_RmpController_SisDs aProcessingError	N.A.	Added to v1.18

Notification title	Severity	ID	Recommendations	Note
SIS metadata loss	CRITICAL	Harmonic_RmpController_SisMetadataLoss	N.A.	Added to v1.18
Slate Insertion Enabled	WARNING	Harmonic_RmpController_SlateInsertionEnabled	This alarm is asserted when the user manually enables slate insertion. Please check the service profile to confirm.	
Slate Insertion For Signal Loss Enabled	WARNING	Harmonic_RmpController_SlateInsertionForSignalLossEnabled	Please check the input resolution and the output resolution in transcoding profile.	
Some programs can not be descrambled	CRITICAL	Harmonic_RmpController_DemuxProgramScrambledIndication	N.A.	Added to v1.14
Source <sourceName> firmware variant mismatch	CRITICAL	Harmonic_RmpController_SdiFirmwareVariantMismatch	N.A.	Added to v1.19
Source <sourceName> SDI port used	CRITICAL	Harmonic_RmpController_SdiPortUsed	N.A.	Added to v1.19
Source <sourceName> signal loss	CRITICAL	Harmonic_RmpController_SourceSignalLostIndication	Please check the configuration and network connectivity of the corresponding source.	
Source <sourcename> signal loss	WARNING	Harmonic_PlayoutSyncLossOnInactive	Please check the live input is available.	Added to v1.13

Notification title	Severity	ID	Recommendations	Note
Service <serviceName> cloud source is offline	WARNING	Harmonic_RmpController_CloudSourceDeactivated	N.A.	Added to v1.20
Service <serviceName> Synamedia general error	CRITICAL	Harmonic_RmpController_SynamediaConnectorGeneralError	N.A.	Added to v1.19
Service <serviceName> Synamedia Oauth error	CRITICAL	Harmonic_RmpController_SynamediaConnectorOAuthError	N.A.	Added to v1.19
Service <serviceName> Synamedia Watermark Manager error	CRITICAL	Harmonic_RmpController_SynamediaConnectorMDMError	N.A.	Added to v1.19
Source Component Properties Changed	IMPORTANT	Harmonic_RmpController_SourceComponentPropertiesChanged	N.A.	Added to v1.23
Source not sync for geo-redundancy	WARNING	Harmonic_RmpController_Active_Active_Source_Not_Sync	N.A.	Added to v1.14
Source switched notification	IMPORTANT	Harmonic_RmpController_SourceSwitchedInfo	N.A.	
Source timecodes discontinuity	WARNING	Harmonic_RmpController_PackerTimeCodeJump	N.A.	Added to v1.21

Notification title	Severity	ID	Recommendations	Note
Source timecodes is missing	WARNING	Harmonic_RmpController_PackagerMissingSourceTimecodes	N.A.	Added to v1.14
Source video cropping failed	WARNING	Harmonic_RmpController_CropConfigError	N.A.	Added to v1.25
Source <sourceName> ST2022-7 errors	WARNING	Harmonic_RmpController_ST20227ErrorIndication	N.A.	Added to v1.25.1
Standby has turned on due to missing HHP heartbeat from master device	CRITICAL	Harmonic_HHPController_StandByOn	Please check the network connectivity of the Master device to VOS and standby device to figure out the reason for the standby device activation.	
Statmux overload	CRITICAL	Harmonic_RmpController_StatmuxOverload	Increase the number of CPU core reserved for the multiplexing profile in LabWizard GUI.	Added to v1.11
STC messages for the specified STC pool are not received.	CRITICAL	Harmonic_RmpController_StatMux_Stc_Msg_Not_Received	Please check the healthiness of the mux service. Restart the transcode service (or mux service) to recover.	
Storage account configuration error	CRITICAL	Harmonic_ExternalAssetPofStorageAccountConfigError	N.A.	Added to v1.23

Notification title	Severity	ID	Recommendations	Note
Storage account configuration error or storage endpoint cannot be reached	CRITICAL	Harmonic_ExternalAssetPofStorageConnectionIssue	N.A.	Added to v1.23
Storage connection issue	CRITICAL	Harmonic_ExternalAssetPofStorageUnknownIssue	N.A.	Added to v1.23
Storage size of LIO task is less than expected	WARNING	Harmonic_LiveIngestOrigin_LiveIngestOriginTaskStorageMisconfigured	Some deployment environment does not support using more than half of instance memory for LIO storage. Please reduce storage size for each Live Ingest Origin task to workaround the issue.	
Stream generation failed	WARNING	3ea2ae3e-a6f4-43d5-b36f-596c77535bc1	Please check the correctness of the stream generation setting.	
Stream processing failed	CRITICAL	com.harmonicinc.vos.spe.service.statefailed	Stream processing failed due to unsupported configuration. Please check the service configuration.	
Synamedia SEI UUID configuration is empty	WARNING	Harmonic_RmpController_NULLSynamediaUUIDWarning	N.A.	Added to v1.20
Syncing public IP for Zixi sources	CRITICAL	com.harmonic.vos.configure.source.lbsync	Time will take to sync the Zixi load balancer and configure app source setting.	

Notification title	Severity	ID	Recommendations	Note
Syncing public IP for Zixi sources in Channel app	CRITICAL	com.harmonic.vos.app.saas.notification.lbsync	N.A.	Added to v1.16
Tcp packet retransmissions threshold allowance has been exceeded	WARNING	Harmonic_Prometheus_Alert_WARNING	Please check the network condition. Contact Harmonic staff if needed.	
Test object zip file not found	WARNING	Harmonic-Origin_MDSTestObjectZipNotFound	N.A.	Added to v1.19.1
The complexity messages from this encoder is not received by the downstream multiplexer.	CRITICAL	Harmonic_RmpController_StatMux_Mux_Not_Receiving_Cx_Msg	N.A.	
The detected network jitter exceeds the provisioned value.	WARNING	Harmonic_RmpController_StatMux_Network_Jitter	N.A.	
The detected route trip delay exceeds the provisioned value.	CRITICAL	Harmonic_RmpController_StatMux_Network_Delay_Exceed_Requirement	N.A.	
The service is stuck in CBR for a long time.	WARNING	Harmonic_RmpController_StatMux_Stuck_In_Cbr	N.A.	

Notification title	Severity	ID	Recommendations	Note
The splice time is in the past	WARNING	Harmonic_RmpController_PackerSpliceTimeInThePast	N.A.	Added to v1.21
The splice time is more than one hour in the future	WARNING	Harmonic_RmpController_PackerSpliceTimeMoreThanOneHourInTheFuture	N.A.	Added to v1.21
The transport stream from this encoder is not received by the downstream multiplexer.	CRITICAL	Harmonic_RmpController_StatMux_Mux_Not_Receiving_Ts	N.A.	
Thumbnail exporter addon didn't start correctly	WARNING	Harmonic_RmpController_ThumbnailExporterMessage	N.A.	Added to v1.23
Timecode Error	WARNING	Harmonic_RmpController_TimecodeError	N.A.	Added to v1.19
Timed Metadata Callback URL unavailable	CRITICAL	Harmonic_Timed_Metadata_Callback_Unavailable	Please check the Timed Metadata callback URL availability.	
Timed Metadata insertion error	CRITICAL	Harmonic_Timed_Metadata_Connection_Fail	Please check the Timed Metadata connectivity.	
Transcoding Configuration Error	WARNING	Harmonic_RmpController_AudioPassthroughWarning	Please check the corresponding source or configuration.	

Notification title	Severity	ID	Recommendations	Note
Trigger is missing <sourceName>	WARNING	Harmonic_MissingTrigger	N.A.	Added to v1.26
Tuner sync loss	CRITICAL	Harmonic_RmpController_TunerSyncLostIndication	N.A.	Added to v1.14
Unable to connect to ECMG	WARNING	vos.simulcrypt.synchronizer.ecmg.unreachable	Ensure that ECMG IP address and port are configured correctly. Check if desired ECMG is online and accessible.	
Unable to load AHDR SL-HDR1 configuration file	WARNING	Harmonic_RmpController_AhdrSIHdr1ConfigurationWarning	N.A.	Added to v1.26
Unable to load LUT file	WARNING	Harmonic_RmpController_LookUpTableConversionWarning	N.A.	Added to v1.21
Unable to validate rivermax license file	CRITICAL	Harmonic_RmpController_RivermaxLicenseValidationWarning	N.A.	Added to v1.21
Unhealthy BBoIP input source	WARNING	Harmonic_RmpController_SdiNetUnhealthyWarning		Added to v1.12

Notification title	Severity	ID	Recommendations	Note
Unhealthy service instance : <sourceName>	WARNING	Harmonic_PlayoutTimelineEventManagerUnhealthy	Please restart the service.	Added to v1.12
Unhealthy service instance - switch to black: <sourceName>	WARNING	Harmonic_PlayoutServiceInstanceUnhealthy	N.A.	Added to v1.26
Unknown GPI <sourceName>	WARNING	Harmonic_MissingGpi	N.A.	Added to v1.26
Unresolved upstream server hostname	WARNING	Harmonic_Origin_UnresolvedUpstream		Added to v1.12
Unsupported Decoding Format => Unsupported Decoding Format	WARNING CRITICAL	Harmonic_RmpController_SpiderUnsupportedDecodingFormatError	N.A.	Added to v1.20 Updated in v1.22
Unsupported language for OCR notification	WARNING	Harmonic_RmpController_UnsupportedLanguageForOCR	Please contact Harmonic to evaluate integration of new language.	
Unsupported service configuration	CRITICAL	stream.processing.engine.service.failure	Please check the service configuration.	

Notification title	Severity	ID	Recommendations	Note
Unsupported source format	CRITICAL	Harmonic_RmpController_UnsupportedSourceFormatIndication	Please check the TS of the input source.	
Unsupported video codec format	CRITICAL	Harmonic_RmpController_UnsupportedSourceVideoCodecIndication	Please check the codec of the input source.	
Variant-Channel-Manipulator container exited and restarted	IMPORTANT	Variant-Channel-Manipulator_ContainerCrash	N.A.	Added to v1.20
Variant-Channel-Manipulator process inside container exited and restarted	IMPORTANT	Variant-Channel-Manipulator_ProcessCrash	N.A.	Added to v1.20
Variant-Channel-Manipulator task is failed to update PMM nginx config map	CRITICAL	Variant-Channel-Manipulator_updateConfigMapFailure	N.A.	Added to v1.20
Variant-Channel-Manipulator task is pending in Kubernetes	CRITICAL	Variant-Channel-Manipulator_CannotLaunch_K8S	N.A.	Added to v1.20
Variant-Channel-Manipulator task is waiting in Marathon	CRITICAL	Variant-Channel-Manipulator_CannotLaunch_ME_SOS	N.A.	Added to v1.20
VCM manipulator container CPU throttling detected	WARNING	Harmonic_Prometheus_Alert_WARNING	N.A.	Added to v1.24

Notification title	Severity	ID	Recommendations	Note
VCM nginx container CPU throttling detected	WARNING	Harmonic_Prometheus_Alert_WARNING	N.A.	Added to v1.24
Video decoding issue	CRITICAL	Harmonic_RmpController_VideoDecoderIssue	N.A.	Added to v1.14
Video format is not supported for using source timecodes as clock => Only H.264 and H.265 video codecs are supported for using source timecodes as clock	WARNING	Harmonic_RmpController_PackerUnsupportedVideoFormatForSourceTimecodes	N.A.	Updated in 1.22
Video is missing in the input	CRITICAL	Harmonic_RmpController_VideoMissingIndication	N.A.	Added to v1.14
Video Processing Unit Library	WARNING	Harmonic_RmpController_SpiderGpuLibraryWarning	N.A.	Added to v1.20
Video Processing Unit Overload	WARNING	Harmonic_RmpController_SpiderGpuOverloadWarning	N.A.	Added to v1.20

Notification title	Severity	ID	Recommendations	Note
Video Property Change	WARNING	Harmonic_RmpController_VideoPropertiesChanged	The alarm is asserted when certain properties of the input video is different from when the service started. Please check the alarm details and see if the change is expected (e.g. frame rate change). The alarm should be remitted when there's no more difference from service start.	
Video Transcoder Error	CRITICAL	Harmonic_RmpController_SpiderStuckKnobError	N.A.	Added to v1.14
Video Watermarking Failure	WARNING	Harmonic_RmpController_VideoWatermarkingFailure	Please check the video encoding configuration, some formats are not compliant with watermarking.	Added to v1.11
VITC is not properly configured in <sourceName>	WARNING	Harmonic_RmpController_ImproperVitcConfigWarning	N.A.	Added to v1.18
VOS App Failure	CRITICAL	Harmonic_System_AppDisabled	Report to DevOps for restoring the vos app.	
VOS/XOS software will no longer be supported on this server hardware starting NMX 9.3 and XOS/VOS 1.18.	IMPORTANT	Harmonic_RmpController_SpiderDeprecatedCPUWarning	N.A.	Added to v1.17

Notification title	Severity	ID	Recommendations	Note
Waiting for load balancers to be ready	WARNING	vos.uplink.hub.uplinks.externalLB.warn		Added to v1.1.2
Waiting for resources	CRITICAL	com.harmonicinc.vos.spe.failedtolaunchtask	<p>System requested for additional resource, please wait. Notification will be resolved once requested resource is available.</p> <p>Persistent assertion of this notification may require addition of resources to the cluster or defragmentation of the allocated resources.</p>	
Waiting for resources	CRITICAL	Harmonic_FileProcessingEngine_FileProcessingEngineTaskLaunchFailure	File Processing Engine task cannot be launched due to insufficient resources. Try to use profile with less resources requirements.	
Waiting for resources	CRITICAL	Harmonic_LiveIngestOrigin_LiveIngestOriginTaskLaunchFailure	System requested for additional resource, please wait. Notification will be resolved once requested resource is available.	
Web-uploaded image asset(s) lost	CRITICAL	02afd71d-df84-4927-b7d0-3d0ba7f2b38c	N.A.	Added to v1.2.6
We cannot verify your identity =(.	CRITICAL	com.harmonicinc.vos.msconnect or.disconnecting	Update your identity by re-connect to Harmonic Hub.	
ZK outstanding request is too large	CRITICAL	Harmonic_Prometheus_Alert_CRITICAL	Contact Harmonic staff.	

Notification title	Severity	ID	Recommendations	Note
ZK sync queue is too large	CRITICAL	Harmonic_Prometheus_Alert_CRITICAL	Contact Harmonic staff.	
Zookeeper cannot be reached	CRITICAL	Harmonic_ZkLongTimeDisconnection	N.A.	Added to v1.2.3

Logs and reporting

Monitor logs from the Logs app, Public API app, and DevOps Portal app.

- [Downloading logs](#)
- [Generating logs output via REST API](#)
- [Configuring a Syslog server](#)

Downloading logs

Download log files (Zip format) from the Logs app to your local hard drive.

⚠ Note

The following steps are performed using a Firefox browser.

1. From the Logs page, click the **Download Logs** button.
2. From the **Opening** dialog box, select **Save File**.
3. From the **Enter Name** dialog box, verify the file location. and then click **Save**.

- [Logs app overview](#)
- [Filtering logs](#)
- [Searching the log](#)
- [Changing the log size](#)

Logs app overview

The Logs app displays output in different formats and additional fields for log entries.

Logs app formats

- [Prose \(plain text\)](#)

- JavaScript Object Notation (JSON)
- Extensible Markup Language (XML)

Prose mode

Prose	06/19/2017 10:52:00 AM CRITICAL Notifications Schedule-fix for Service WS1src-Multiscreens Silver SD-ws1Dest2022-6: Stream processing failed, is overdue
JSON	<pre>{ "id": "AVzBe5J9T6kfBu4vKgYX", "time": "2017-06-19T17:52:00.038Z", "severity": "CRITICAL", "originator": "Notifications", "message": "Schedule-fix for Service WS1src-Multiscreens Silver SD-ws1Dest2022-6: Stream processing failed, is overdue" },</pre>
XML	<pre><log> <id>AVzBe5J9T6kfBu4vKgYX</id> <time>2017-06-19T17:52:00.038Z</time> <severity>CRITICAL</severity> <originator>Notifications</originator> <message>Schedule-fix for Service WS1src-Multiscreens Silver SD-ws1Dest2022-6: Stream processing failed, is overdue</message> </log></pre>

The Verbose mode displays additional fields for log entries.

Standard and verbose mode

Standard Mode

```
<log>
  <id>AVzBfnhPT6kfBu4vKgal</id>
  <time>2017-06-19T17:55:09.865Z</time>
  <severity>IMPORTANT</severity>
  <originator>REST API</originator>
  <message>REST API Response [ POST /vos-api/notification/v1/notifications/20170605-2207146650-00030-64871/schedule_fix 200 ]</message>
</log>
```

Verbose Mode

```
<log>
  <id>AVzBfnhPT6kfBu4vKgal</id>
  <time>2017-06-19T17:55:09.865Z</time>
  <severity>IMPORTANT</severity>
  <originator>REST API</originator>
  <message>REST API Response [ POST /vos-api/notification/v1/notifications/20170605-2207146650-00030-64871/schedule_fix 200 ]</message>
  <timestamp>1497894909865</timestamp>
  <rest_req_json>{"acknowledgedBy":"greg.stamp@harmonicinc.com","scheduleFixTime":"2017-06-21T17:55:00.000Z","scheduleFixInstruction":"Snooze after 10 minutes"}</rest_req_json>
  <rest_src_ip>50.206.120.10</rest_src_ip>
  <rest_resp_json>
    <rest_resp_code>200</rest_resp_code>
    <rest_user>Anonymous</rest_user>
  </rest_resp_json>
  <application>VOS</application>
  <rest_url>/vos-api/notification/v1/notifications/20170605-2207146650-00030-64871/schedule_fix</rest_url>
  <rest_http_verb>POST</rest_http_verb>
  <host>10.10.1.254:50208</host>
  <rest_resp_code>200</rest_resp_code>
  <rest_user>Anonymous</rest_user>
</log>
```

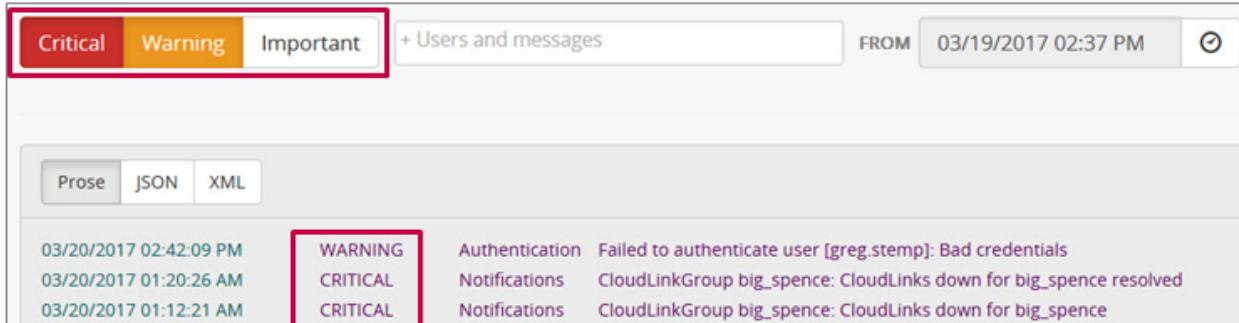
Filtering logs

Log entries can be filtered by the severity of the event.

- Several severity levels can be used for filtering logs:

- Critical: System is or will be unstable if the issue is not resolved (e.g. resource unavailable).
- Warning: Recoverable errors (e.g. resources have reached a specified threshold).
- Important: Informational messages; non-negative events (e.g. user logins and logoffs).
- More than one severity level can be selected at a time

Multiple severity levels



The screenshot shows the Logs app interface. At the top, there is a red-bordered box containing three tabs: 'Critical' (selected), 'Warning', and 'Important'. Below this is a search bar labeled '+ Users and messages' and a date range 'FROM 03/19/2017 02:37 PM' with a refresh icon. Underneath the search bar are three buttons: 'Prose' (selected), 'JSON', and 'XML'. The main area displays log entries with columns for 'Time', 'Severity', 'Originator', and 'Message'. A red box highlights the 'Severity' column, which contains 'WARNING', 'CRITICAL', and 'CRITICAL'. The log entries are:

Time	Severity	Originator	Message
03/20/2017 02:42:09 PM	WARNING	Authentication	Failed to authenticate user [greg.stemp]: Bad credentials
03/20/2017 01:20:26 AM	CRITICAL	Notifications	CloudLinkGroup big_spence: CloudLinks down for big_spence resolved
03/20/2017 01:12:21 AM	CRITICAL	Notifications	CloudLinkGroup big_spence: CloudLinks down for big_spence

Searching the log

Specify text strings to display specific log entries.

1. From the Logs app, in the **Users and messages** field, type the text string that you want to search for and then press **Enter**.

Note

Most special characters result in an Invalid Input error.

Info

Only log entries that include the text string somewhere in the **Originator** or **Message** fields are displayed.

2. To restore the default display, click the **Remove** button  located next to the text string.

Changing the log size

Change the space available for log size storage.

1. From the Logs page, click **Settings**.
2. From the Settings page, on the **General** tab, in the **Log Storage Limit (MB)** field, type the maximum log size (in megabytes).

Info

Logs must be between 10 and 9999 MB, inclusive.

3. Click **Save**.

Generating logs output via REST API

Generate detailed logs output with the REST API calls from the Public API app.

1. From the Public API app, click **Logs**.
2. From the Logs section, click **Get logs**.
3. From the Logs pane, from the Parameters section, click **format** and then click **Plain**.
4. Click **verbose** and then click **True**.
5. From the Response Messages section, click **Try it Out**.

Result: Returned log entries are displayed in the **Response Body** section.

VOS REST API Documentation

Access the VOS REST API documentation from the Public API app.

You can also click [here](#).

VOS Rest API documentation

The screenshot shows the VOS REST API Documentation page. At the top right is the Harmonic VOS logo. The main content area has a red header "VOS REST API Documentation". Below the header is a paragraph of legal disclaimers. Underneath that is a section titled "Overview" with a brief description of what the REST API does.

Table of Contents

- VOS REST API Documentation
- Overview
- Getting Started with the REST API
 - Access to the REST API
 - Service Management
 - IPTV Service Setup
 - Service Monitoring & Control
- System Management
 - Logs
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- Paths
 - Delete manifest filtering profile
 - Get manifest filtering profile
 - Update manifest filtering profile
- Create destination
- Get destinations
- Delete destination
- Get destination
- Update destination
- Create image
- Get images
- Delete image
- Get image by ID

Configuring a Syslog server

Configure a Syslog server to store log entries.

1. From the Logs page, click **Settings > Advanced > Add New Notify Address**.
2. In the **Syslog IP Address** field, type the IP address of the Syslog server.
3. In the **Port** field, type the port number used by the Syslog server.
4. Click **Save**.

Removing a Syslog server

Cancel the configuration pointing to the Syslog server.

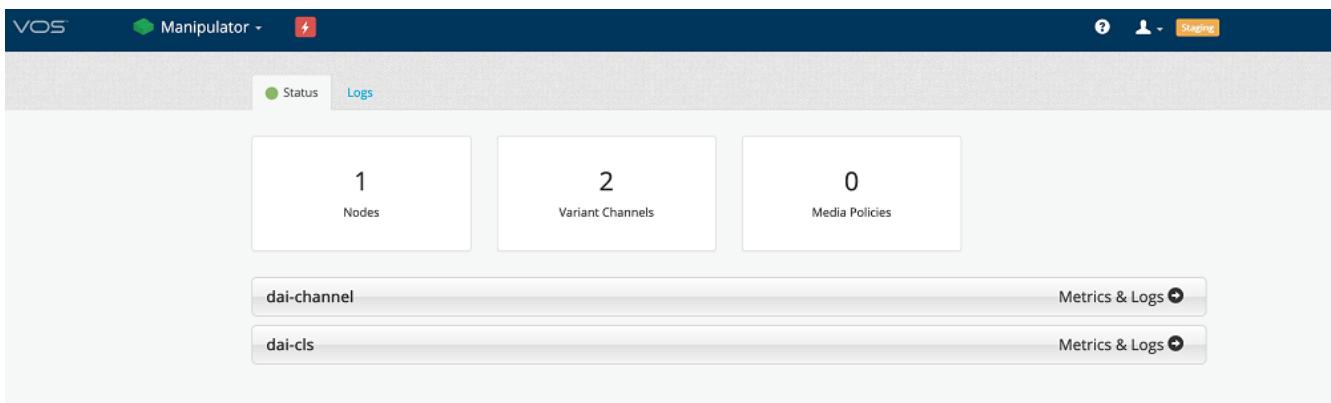
1. From the Logs page, click **Settings > Advanced**, and then click the **Remove** button  next to the Syslog server to be removed.
2. Click **Save**.

Monitoring status and statistics with the Manipulator app

The Manipulator app provides a quick overview of status and statistics for nodes and variant channels.

Status page

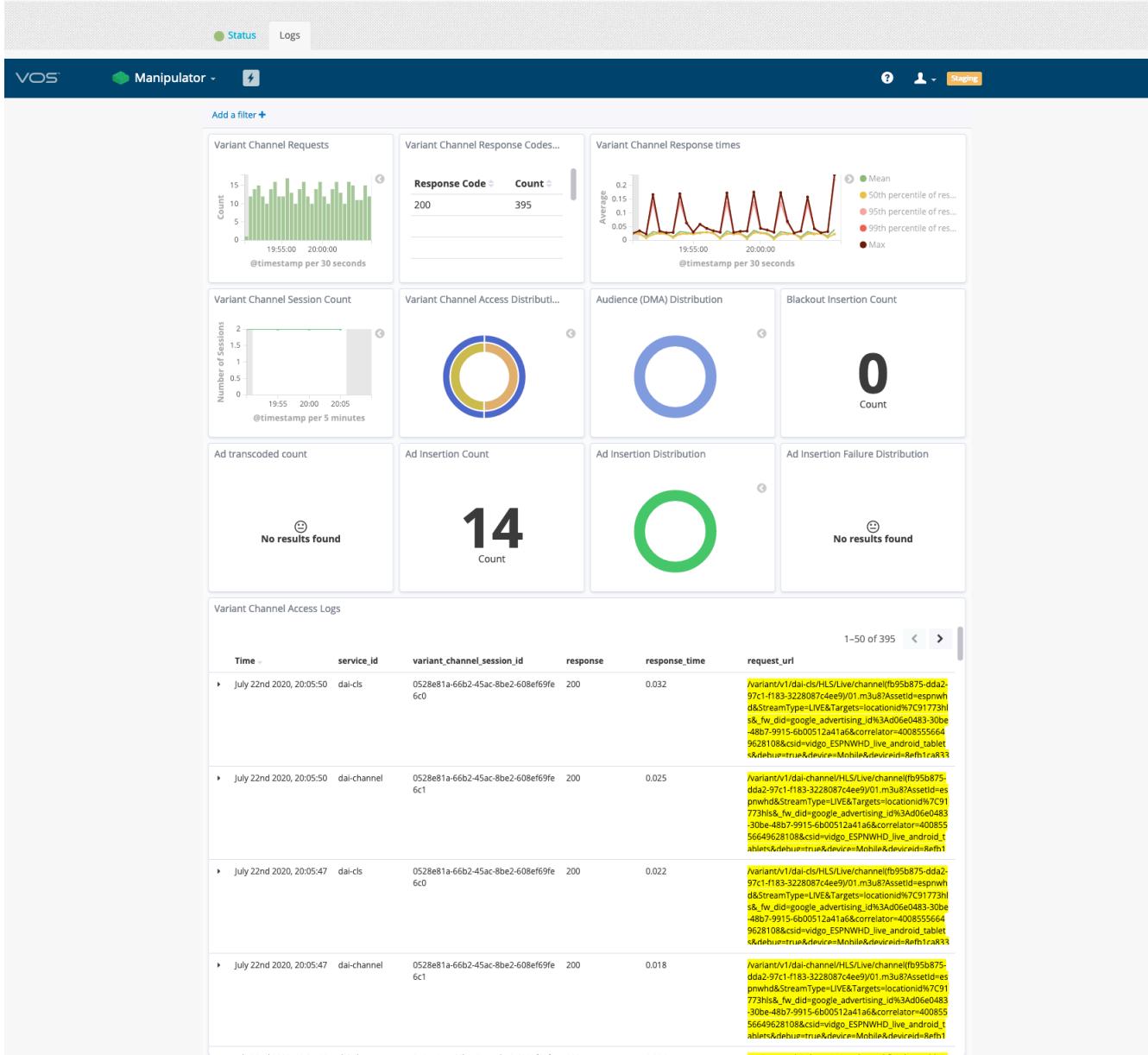
This shows the overall status of the variant channels configured on the Manipulator app and also provides a quick way to view the logs and metrics of a particular variant channel.



Logs page

This page gives the metrics and logs about variant channel requests.

The metrics and logs can be filtered by particular variant channel, either by the shortcut in status page or manually add a Kibana filter on "service_id".



Service placement optimization and resources reservation for demanding UHD services

Kubernetes Scheduler controls pods allocation across all the nodes in the cluster. Node selection for starting a pod are based on filtering and scoring algorithms (<https://kubernetes.io/docs/concepts/scheduling-eviction/kube-scheduler/#kube-scheduler-implementation>).

For most cases pod allocation is optimal and all pods are distributed across the cluster. However for some uneven workload cases default algorithm is not optimal. UHD service placement is one of such cases.

UHD service pod is significantly larger in terms of resources than SD/HD service pod. It can happen that several smaller services pods distributed across the cluster can consume enough resources on every cluster node so

K8S scheduler would not find a suitable node for UHD service to start, despite overall cluster resource pool is still enough for UHD service.

For mitigate this situation pods need to be tightly packed to free-up space for the UHD service.

i Balloon pods

A balloon pod is a low priority pod created to reserve resources for a UHD service pod. It would be evicted on real UHD pod startup.

Also it would be started again when UHD pod is stopped to maintain resources reservation.

Services placement optimization procedure

! Maintenance window required

Service interruption expected due to existing services offline/online.

i All following actions are performed on first cluster node (or any K8S master node).

1. Check the container images versions used for other service pods. It will be required for balloon pods configuration.

Find any stream processing-pod running in cluster and do `kubectl describe` to get it's configuration.

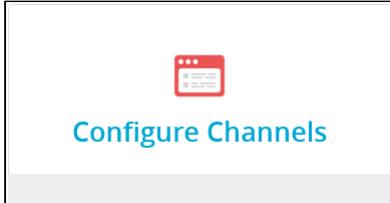
Look for images version of `vos-rmp-sspe` and `live-ingest` containers.

```
# kubectl -n [namespace] get pods | grep stream-processing
[root@k8s-node-001 ~] kubectl -n teazone2 get pods | grep stream-processing
stream-processing-03df020d-45f0-0915-ba07-d2e7aa43e53c-1.0pmv4p 2/2     Running
0          21d

# kubectl -n [namespace] describe pod [any stream-processing pod name]
[root@k8s-node-001 ~] kubectl -n teazone2 describe pod stream-
processing-03df020d-45f0-0915-ba07-d2e7aa43e53c-1.0pmv4p
Name:           stream-processing-03df020d-45f0-0915-ba07-d2e7aa43e53c-1.0pmv4p
Namespace:      teazone2
Priority:       0
Service Account: default
Node:           k8s-node-004/172.19.162.27
Start Time:     Tue, 19 Dec 2023 09:16:36 -0800
[...SKIP...]
Containers:
  vos-rmp-sspe:
    Container ID: containerd://
    1d8cd263d18503c45a4265085d5ae3e78e5bc04c9e8052a1f7b26e78498fc533
    Image:          hlitreleases.azurecr.io/vos-stream-rmp-datapath-docker:1.20.0.0
    .139 # <- RMP container version
```

```
[...SKIP...]
live-ingest:
  Container ID: containerd://
fb1992db8fcc5d41be903e76620187a80222e9bc26f3aab0e07f2cbdc0b41603
  Image:          hlitreleases.azurecr.io/vos-live-ingest-origin-docker:1.22.0.0.
93    # <- LIO container version
[...SKIP...]
```

- Offline all services running on VOS cluster using VOS-UI "Configure Channels" app.



- Prepare YAML manifest `spare_priority.yml` for a new K8S PriorityClass with low priority.

spare_priority.yml

```
---
apiVersion: scheduling.k8s.io/v1
kind: PriorityClass
metadata:
  name: spare-priority
value: -10
globalDefault: false
description: "Low priority pod class."
```

Apply this manifest to the cluster.

```
# kubectl -n [namespace] apply -f spare_priority.yml
[root@k8s-node-001 ~] kubectl -n teazone2 apply -f spare_priority.yml
priorityclass.scheduling.k8s.io/spare-priority created
```

- Prepare YAML manifest `balloon_deployment.yml` for balloon pod deployment.

Replace the corresponding image versions in file.

Additionally set CPU and memory values that corresponds to UHD service values (the same for requests and limits, amount of resources to be reserved by one balloon pod).

balloon_deployment.yml

```
---
apiVersion: apps/v1
kind: Deployment
metadata:
  name: balloon-deployment
```

```

spec:
  selector:
    matchLabels:
      app: balloon-deployment
  replicas: 1
  template:
    metadata:
      labels:
        app: balloon-deployment
    spec:
      nodeSelector:
        node-role.vos/live_ingest: "true"
      imagePullSecrets:
        - name: vos-docker-registry
      containers:
        - name: balloon-pod-rmp
          image: hlitrreleases.azurecr.io/vos-stream-rmp-datapath-docker:[image
version] # <- RMP container version
          command:
            - sleep
            - "3600000000"
          resources:
            requests:
              cpu: [CPU]      # <- UHD service CPU requirement
              memory: [RAM]G  # <- UHD service RAM requirement
            limits:
              cpu: [CPU]      # <- UHD service CPU requirement
              memory: [RAM]G  # <- UHD service RAM requirement
        - name: balloon-pod-lio
          image: hlitrreleases.azurecr.io/vos-live-ingest-origin-docker:[image
version] # <- LIO container version
          command:
            - sleep
            - "3600000000"
          resources:
            requests:
              cpu: 0.1
              memory: 100M
            limits:
              cpu: 0.1
              memory: 100M
      priorityClassName: spare-priority
      terminationGracePeriodSeconds: 0

```

Apply this manifest to the cluster.

```

# kubectl -n [namespace] apply -f balloon_deployment.yml
[root@k8s-node-001 ~] kubectl -n teazone2 apply -f balloon_deployment.yml
deployment.apps/balloon-deployment created

```

One balloon pod with configured size would be deployed in the cluster.

5. Using deployment scaling set the number of balloon pods according to planned number of UHD services, cluster resources for UHD services would be pre-allocated by balloon pods.

```
# kubectl -n [namespace] scale deployment balloon-deployment --replicas [number of pods]
[root@k8s-node-001 ~] kubectl -n teazone2 scale deployment balloon-deployment --replicas 2
deployment.apps/balloon-deployment scaled
```

6. Online all services on VOS cluster using VOS-UI "Configure Channels" app.
7. Online UHD services.

- i** If required number of balloon pods can't be created (e.g. new pods stuck in Pending state) it's likely that cluster ingest nodes are out of resources.
It's recommended to add more ingest nodes to the cluster.

Public internet connection

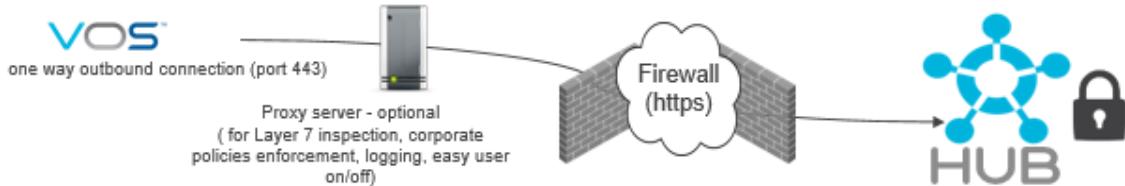
Both the client PC and VOS Cloud-Native Software require a public internet connection for access to the Harmonic Hub.

- [Secure connection to Harmonic Hub](#)
- [Operations requiring connectivity to the Harmonic Hub](#)

Secure connection to Harmonic Hub

VOS Cloud-Native Software initiates a one-way, outbound-only HTTPS connection to the Harmonic Hub on port 443. Upon connection, an X.509 certificate is issued to verify that the VOS Cloud-Native Software is communicating with Harmonic. Data can then flow in both directions, allowing users to perform operations that require Hub connectivity, such as updating profiles. All downloads from the Harmonic Hub must be initiated and confirmed by the customer.

Secure outbound connection



For more information regarding protocols and port usage by the VOS Cloud-Native Software please refer to [VOS network requirements](#).

Operations requiring connectivity to the Harmonic Hub

The Harmonic Hub serves as the customer portal for several VOS Cloud-Native Software operations. The device running the VOS UI through a web browser, such as a PC or laptop, must have access to the internet to complete these operations.

⚠ Important

The following operations will be disrupted if the public internet connection is lost.

- User authentication via Harmonic Identity Provider (IdP)
- Software downloads (including beta versions)
- System backups and snapshot storage
- Customer profile version management (note that profile versions used in active services are cached to the VOS Cloud-Native Software)
- Service activation (licensing and entitlements are managed by the Harmonic Hub)

- Live access to Harmonic technical support
- VOS Cloud-Native Software reporting and diagnostics

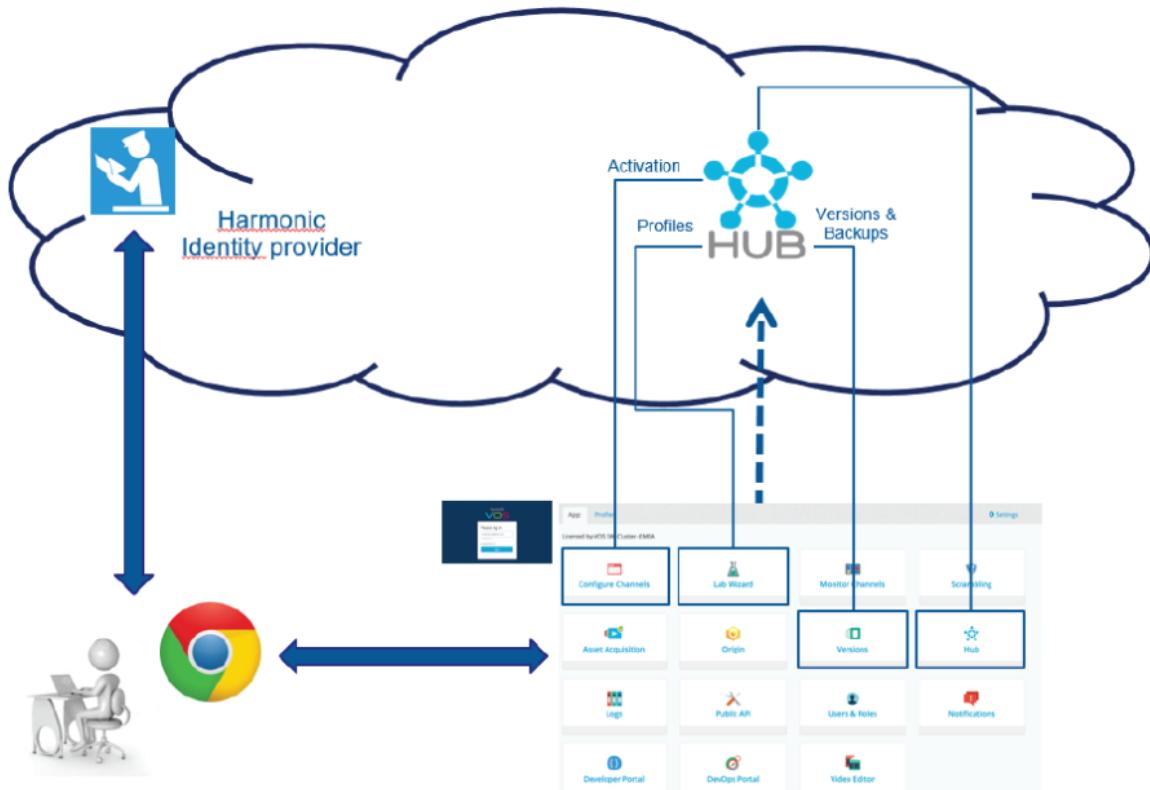
ⓘ Info

A loss of internet connection / Harmonic's identity provider (Okta) downtime will not interrupt active services or impact redundancy.

In the event that the public internet connection is lost, note the following:

- If a user is logged in via Harmonic IdP and the connection is lost, then the user may continue monitoring services until the credentials cache expires. The user may also perform some operations such as switch input/output.
- A loss of public internet connection will not affect users' ability to log in using a second identity provider (SAML SSO). Second identity providers are configured through the customer network and do not require a connection to the Harmonic Hub

Operations that require Harmonic Hub connectivity



Related information

[VOS network requirements](#)

[Managing users and roles](#)

[Managing profiles](#)

[Configuring and monitoring services](#)

[Creating a snapshot](#)

[Restoring a snapshot](#)

[Monitoring and troubleshooting](#)

SAML IdP Federation Integration

Harmonic can provide instructions for integration of a customer-provided Okta Identity Provider (IdP) and Harmonic's Okta IdP.

If you are using a different identity provider, contact Harmonic technical support for more details and assistance.

Obtaining SAML SP metadata for configuration

Follow this procedure to obtain the service provider Entity ID and Assertion Consumer URL, which are needed for configuring the service provider for the VOS Cloud-Native Software.

- From the Developer API, make the following call: POST /saml/v1/sp/metadata.

entityBaseUrl	Enter the VOS domain name, without the trailing forward slash (/).
entityId	Can be the same as above, or any unique string representing the service provider.

- Make the following call and then keep the output for later use: GET /saml/v1/sp/metadata.

Example response:

```
{
  "entityId": "https://192.168.20.2",
  "entityBaseUrl": "https://192.168.20.2",
  "assertionConsumerServiceUrl": "https://192.168.20.2/saml/SSO"
}
```

Configuring an SAML IdP for VOS

When you configure the third-party SAML IdP, note these requirements when adding VOS users.

- Ensure that VOS Cloud-Native Software users authenticate with a username that is their email address.
- In the SAML request, ensure that you include the following attributes for displaying users' names in VOS:

Attribute name	Name format	Attribute value	Required
firstname	urn:oasis:names:tc:SAML:2.0:attrname-format:unspecified	First name of the user, as it should appear in the UI	True
lastname	urn:oasis:names:tc:SAML:2.0:attrname-format:unspecified	Last name of the user, as it should appear in the UI	True
vosrole	urn:oasis:names:tc:SAML:2.0:attrname-format:unspecified	<p>Corresponding VOS Cloud-Native Software user role (Operator, System Engineer, Lab Wizard, etc.). Note the following:</p> <ul style="list-style-type: none"> If not specified, user is by default assigned to Operator. Login will be rejected if the value does not determine an existing role in VOS Cloud-Native Software. Login will be rejected if multiple vosrole attributes are passed in the SAML assertion. If the user already exists in VOS Cloud-Native Software but is assigned to a different role than what is indicated by this attribute value, the user will switch to the new role accordingly. <div style="border: 1px solid #f0e68c; padding: 10px; margin-top: 10px;"> <p>⚠ Note</p> <p>Many SAML IdPs can support mapping user group names to specific attribute values in SAML assertion. By making use of this attribute, you can control the VOS user role mapping via user group management in the SAML IdP.</p> </div>	False

- [Configuring Okta for VOS](#)

Configuring Okta for VOS

You must have administrator access in Okta to perform this procedure.

1. From the **Applications** page in Okta, click **Add Application**.
2. Select **Create New App**, choose **SAML 2.0** and click **Create**.
3. For **App Name**, type VOS.
This is the display name of the app in the Okta.
4. Optionally, upload an app logo.
5. Click **Next**.
6. Under **General**, configure the following settings:

Single Sign-on URL	Enter the assertionConsumerServiceUrl from the GET /saml/v1/sp/metadata call response.
Audience URI (SP Entity ID)	Enter the entityID from the GET /saml/v1/sp/metadata call response.
Name ID format	Select EmailAddress .
Application Username	Select Email .

7. In the **ATTRIBUTE STATEMENTS (OPTIONAL)** section, create first name and last name mapping as follows:

Name	Name format	Value
firstname	Unspecified	user.firstName
lastname	Unspecified	user.lastName

Okta SAML settings

The screenshot shows the 'General' configuration section of the Okta SAML setup. It includes fields for Single sign on URL (https://otang-01.nebula.video/saml/SSO), Audience URI (SP Entity ID) (https://otang-01.nebula.video), Default RelayState (blank), Name ID format (EmailAddress), Application username (Email), and a checkbox for 'Use this for Recipient URL and Destination URL'. Below these are 'Show Advanced Settings' and 'ATTRIBUTE STATEMENTS (OPTIONAL)' sections. The 'ATTRIBUTE STATEMENTS (OPTIONAL)' section contains two entries: 'firstname' with 'Name format (optional)' set to 'Unspecified' and 'Value' set to 'user.firstName', and 'lastname' with 'Name format (optional)' set to 'Unspecified' and 'Value' set to 'user.lastName'. There is also an 'Add Another' button.

GENERAL

Single sign on URL

Use this for Recipient URL and Destination URL

Audience URI (SP Entity ID)

Default RelayState

If no value is set, a blank RelayState is sent

Name ID format

Application username

Show Advanced Settings

ATTRIBUTE STATEMENTS (OPTIONAL) LEARN MORE

Name	Name format (optional)	Value
firstname	Unspecified	user.firstName
lastname	Unspecified	user.lastName

Add Another

8. Click **Next**.
9. Select **I'm an Okta customer adding an internal app**, and then click **Finish**.
10. Download the **Identity Provider metadata**, which you will need to add to the VOS Cloud-Native Software in the next procedure.

Adding SAML IdP metadata to VOS

Adding the SAML IdP metadata will initialize the IdP with VOS and enable you to login with your SSO credentials.

1. From the Developer API, navigate to the following call: POST /saml/v1/idp/metadata.
2. Specify the following parameters:

label	A string identifying the SAML IdP, for example Okta.
--------------	--

metadata	Enter the IdP metadata that you downloaded in the previous procedure. Open the file in a text editor and copy the entire contents to this field.
name	Name of the SAML IdP, for example okta.

Adding SAML IdP metadata to VOS

The screenshot shows the 'Add IDP metadata' screen with the following details:

- Method:** POST /saml/v1/idp/metadata
- Implementation Notes:** Add IDP metadata for SAML.
- Parameters:**

Parameter	Description	Parameter Type	Data Type
metadata	metadata	body	Model Model Schema Model Form
- Metadata Content:** A JSON object representing the IdentityProviderConfiguration. The JSON is:

```
{
  "label": "okta",
  "metadata": "<?xml version='1.0' encoding='UTF-8'?><md:EntityDescriptor xmlns:md='urn:oasis:names:tc:SAML:2.0:metadata' entityID='http://www.okta.com/exk9iaan7n78Xzin40h7'><md:IDPSSODescriptor
"
}
```
- Parameter content type:** application/json
- Model Form:** A modal window showing the 'IdentityProviderConfiguration' model with fields for label (Okta), metadata (<?xml version="1.0" encoding="UTF-8"?><md:EntityDescriptor ...), and name (okta). A red arrow points to the 'Set as parameter value' button at the bottom right of the modal.

- Click **Set as parameter value** and then click **Try it out!**.
- Wait at least 10 seconds for the metadata to be loaded and activated, and then make the following call to verify configuration: GET /saml/v1/idp/metadata.

Example response:

```
[
  {
    "name": "okta",
    "label": "Okta",
    "isInitialized": true,
    "entityId": "http://www.okta.com/xxxxxxxxxxxxxxxxxxxx"
  }
]
```

- Ensure "isInitialized":true. If it is not, wait a bit longer and then repeat the call. If the value is still not true, delete the IdP configuration file (DELETE /saml/v1/idp/metadata/[IdP_name]), and then repeat this procedure.

Result

Once the SAML IdP has been initialized, a new login button will appear on the VOS Cloud-Native Software login page.

Related information

[Accessing VOS](#)

VOS CLI reference

The VOS CLI makes direct calls to the REST API, which allows you to quickly make updates to the VOS Cloud-Native Software, monitor services, and perform a number of other essential tasks.

Note

To avoid a login error on Windows clients, you must use the default command line tool (cmd.exe), not the Cygwin command line tool. All commands are executed via vos.exe. For example, vos.exe config init.

- [Getting started with the VOS CLI](#)
- [Installing on Windows](#)
- [Installing on OSX](#)
- [Installing on Unix/Linux](#)
- [Registering the CLI client](#)
- [List of supported commands](#)
- [Global command options](#)
- [CLI configuration commands](#)
- [Authentication commands](#)
- [Setup commands](#)
- [Service and profile management commands](#)
- [Asset management commands](#)
- [Maintenance and monitoring commands](#)

Getting started with the VOS CLI

Follow these steps to install, configure, and begin using the VOS CLI.

1. Download and install the CLI to the client computer. Refer to the instructions for your client OS:
[Installing on Windows](#)
[Installing on OSX](#)
[Installing on Unix/Linux](#)
2. Configure the connection and other CLI settings. Refer to [vos config init](#).
3. Log in to the VOS Cloud-Native Software:
 - For Okta mode: Register the CLI client with VOS Cloud-Native Software, and then run vos login client.
 - For basic authentication: Run vos login.
4. To perform first run:
 - For Okta mode: Run vos init key.
 - For basic authentication: Run vos init.

Installing on Windows

On Windows, the VOS CLI is provided as a standard executable file.

1. From the Harmonic Hub, select **Software > VOS CLI**, and then download the installer for Windows.
2. Save vos.exe to the desired folder.

What to do next

Configure the connection and other VOS CLI settings. Refer to [vos config init](#).

Note

To avoid a login error on Windows clients, you must use the default command line tool (cmd.exe), not the Cygwin command line tool. All commands are executed via vos.exe. For example, vos.exe config init.

Installing on OSX

On OSX, the VOS CLI is provided as a compressed TAR file.

1. From the Harmonic Hub, select **Software > VOS CLI**, and then download the installer for Mac OS X.
2. Save vos_osx.tgz to your local drive and unpack the compressed file.
3. In the output folder of the unzipped archive, locate the vos binary file, move it to the desired folder, and make it an executable.

Example:

```
Mac-User:.vos_cli admin$ mv vos_cli/output/osx/vos .
Mac-User:.vos_cli admin$ chmod +x vos
```

What to do next

Configure the connection and other CLI settings. Refer to [vos config init](#).

Installing on Unix/Linux

On Linux, the VOS CLI is provided as a compressed TAR file.

Note

Harmonic recommends CentOS for the VOS CLI host.

1. From the Harmonic Hub, select **Software > VOS CLI**, and then download the installer for Linux.
2. Save vos_linux.tgz to your local drive and unpack the compressed file.
3. In the output folder of the unzipped archive, locate the vos binary file, move it to the desired folder, and make it an executable.

Example:

```
[vagrant@2bd6ac8909e1 vos_cli]$ mv ~/.vos_cli/vos_cli/output/linux/
vos ~/.vos_cli
[vagrant@2bd6ac8909e1 vos_cli]$ chmod +x ~/.vos_cli/vos
```

4. To call the VOS CLI app directly from the command prompt, add this folder to your PATH.

⚠ Note

Harmonic strongly recommends using hidden folders.

Example:

```
[vagrant@2bd6ac8909e1 vos_cli]$ export PATH=$PATH:~/._.vos_cli
[vagrant@2bd6ac8909e1 vos_cli]$ vos
```

What to do next

Configure the connection and other VOS CLI settings. Refer to [vos config init](#).

Troubleshooting the libpcap issue on Linux

If you encounter a LIBPCAP error when executing vos commands, you must install the libpcap-devel library and, on Ubuntu clients, add a symbolic link.

ⓘ Info

This issue was resolved in v0.1.0.0-eng.236.

If you encounter the following error, follow the instructions to troubleshoot the issue on your Linux distribution:

```
root@1fb2c75b1a5d:/# vos
vos: error while loading shared libraries: libpcap.so.1: cannot open shared object file: No such file or directory
```

- On CentOS clients, install the required library as follows: yum install -y libpcap-devel.
- On Ubuntu clients, install the required library and create a symbolic link, as follows:

```

root@a865c2a5e21c:#apt-get install libpcap-dev -y

root@a865c2a5e21c:# apt-get -s install libpcap-dev
Reading package lists... Done
Building dependency tree
Reading state information... Done
libpcap-dev is already the newest version (1.7.4-2).
0 upgraded, 0 newly installed, 0 to remove and 8 not upgraded.

root@a865c2a5e21c:~#ln -s libpcap.so.1.7.4 libpcap.so.1

```

Registering the CLI client

Register the CLI client to generate a client ID and client Secret that may be submitted in exchange for an access token. Perform this procedure in the Public API app.

You can also generate a client ID and client Secret from the VOS system settings.

Before you begin

Configure the VOS CLI. Refer to [vos config init](#).

- From the Public API, click **Client Apps** to show the available API calls.

This page is for reference and testing only.
For API integration, please visit [Settings](#) to create OAuth client apps.

VOS	Asset Acquisition	ATM	BxfControlAdaptor	Client Apps
VOS REST APIs Created by moore.macaulay@harmonicinc.com Harmonic Inc.				
Show/Hide	Show/Hide	Show/Hide	Show/Hide	Show/Hide
List Operations	List Operations	List Operations	List Operations	List Operations
Expand Operations				

- Click POST /client-apps/v1/apps and configure the following parameters:

authorized_grant_types	<ul style="list-style-type: none"> set the value to <i>AUTHORIZATION_CODE</i> for Authorization code OAuth login flow; set the value to <i>CLIENT_CREDENTIALS</i> for client credential only OAuth login flow; it is possible to set both values in order to be able to login via both methods.
description	Optional string.

redirect_URI	Set the value to http://localhost
role	Optional string.

Figure: POST /client-apps/v1/apps

Parameters

Parameter	Value
clientDetailsConfig	<pre>{ "authorized_grant_types": ["AUTHORIZATION_CODE"], "description": "string", "redirect_uri: ["http://localhost"], "role": "string" }</pre>

Parameter content type: application/json

- Click **Try it out!**.

Result: The response will provide values for **clientID**, **clientSecret**, and **redirectURI**.

Figure: POST /client-apps/v1/apps response

Response Body

```
{
  "client_id": "428961ad-c43d-4bb0-8524-58eca5a69549",
  "client_secret": "fcd541573602157daa69c2b48c79baa6",
  "authorized_grant_types": [
    "REFRESH_TOKEN",
    "AUTHORIZATION_CODE"
  ],
  "redirect_uri": [
    "http://localhost"
  ],
}
```

- Perform the login process.

- For the login with a client ID and a client Secret, use the following command:

```
$ vos login client --clientID={client_id} --clientSecret={client_secret}
```

After successful login you will see this message:

```
Client credential OAuth login flow used. API token obtained successfully and
will expire at 29 Mar 18 03:06 +0000
```

- For the login with an authorization code, use the following command with additional redirectUri parameter:

```
$ vos login client authCode --clientID={client_id} --  
clientSecret={client_secret} --redirectUri={redirect_uri}
```

Result: The output will direct you to a URL that you must visit in order to obtain a registration code. For example:

```
Visit the URL in web browser: https://localhost:38001/oauth/authorize?  
client_id=ac58512f-6775-42f6-8db9-  
f53bb4e27936&redirect_uri=http%3A%2F%2Flocalhost&response_type=code&scope=tru  
st Please enter your code
```

Ensure that you are still logged into VOS, and then visit the URL in the response.

Result: The URL updates automatically with the registration code. **For example:**

```
http://localhost/?code=wSaisI
```

Enter the code at the command line. **For example:**

```
Please enter your code wSaisI API token obtained successfully and will expire  
at 29 Mar 18 03:06 +0000
```

Related information

[Registering an OAuth client application](#)

List of supported commands

Find the name, abbreviation (if available), and description of all commands supported by VOS CLI.

Tip

You can run the `vos` command to see all available subcommands as well as the CLI version. To see only the CLI version, pass the **-version** option.

Note

To avoid a login error on Windows clients, you must use the default command line tool (`cmd.exe`), not the Cygwin command line tool. All commands are executed via `vos.exe`. For example, `vos.exe config init`.

Command name	Description
vos asset	Manage VOD assets
vos atm	Manage ATM profiles
vos capture	<p>Manage captured files (.pcap)</p> <div style="border: 1px solid #f0e68c; padding: 10px;"> <p>⚠ Note</p> <p>This is available for the Linux/Unix platform and Mac based system only.</p> </div>
vos channel, vos ch	Manage channels on the VOS Cloud-Native Software
vos cloudlink, vos cl	<p>Register, pair, and maintain CloudLink instances in Okta mode or basic authentication mode</p> <div style="border: 1px solid #f0e68c; padding: 10px;"> <p>⚠ Note</p> <p>In Okta mode, you must use the client credentials authorization flow. Note required options.</p> </div>
vos config, vos conf	Configure the VOS connection
vos configure	Provision VOS services
vos destination, vos dest	Manage service destinations
help, h	Show a list of subcommands and options
vos init	<p>Perform initial setup of VOS Cloud-Native Software environment</p> <div style="border: 1px solid #f0e68c; padding: 10px;"> <p>⚠ Note</p> <p>You must use vos init key in Okta mode.</p> </div>

Command name	Description
vos login	<p>Obtain an access token with login/password or clientId/clientSecret</p> <div style="border: 1px solid #f0e68c; padding: 10px;"> <p>⚠ Note</p> <p>You must use vos login client in Okta mode.</p> </div>
vos logout	Remove API token
vos node, vos nd	Maintain VOS nodes
vos notification	Manage VOS notifications
vos oauth	<p>Refresh token for authorization code grant type.</p> <div style="border: 1px solid #f0e68c; padding: 10px;"> <p>⚠ Note</p> <p>This command does not support Okta mode.</p> </div>
vos origin, vos or	Manage Origin services
vos service, vos srv	Manage services on the VOS Cloud-Native Software
vos snapshot, vos sn	Create and restore system backups
vos source, vos src	Manage CloudLink input sources

Global command options

Global options may be passed on any command.

- [ignoreCertificate](#)
- [requestLimit](#)

ignoreCertificate

If the VOS Cloud-Native Software is using an invalid or expired SSL certificate, then add this option to override the server certificate error.

 **Note**

Adding this option to your requests may cause additional security issues.

If you wish to configure this option as a persistent flag, then do one of the following:

- Add the parameter to the vos config init command.
- Add the parameter to vos.json.

Sample output

Server certificate error:

```
[vagrant@aa5465975a40 trunk]$ vos login -login=vos -password=voossdk
Server certificate error. Set ignoreCertificate to true to ignore
```

vos login command:

```
[vagrant@aa5465975a40 trunk]$ vos login -login=vos -password=voossdk -
ignoreCertificate=true
API token obtained successfully and will expire at 15 Dec 16 20:49 +0000
```

vos config init command:

```
[vagrant@aa5465975a40 trunk]$ vos config init -instanceUrl=https://
media-01.vos.video -ignoreCertificate=true
new config file created with provided instance URL,
you can edit instance URL in /vagrant/dev/cli_app/trunk/vos_cli/cli/bin/vos.json
```

requestLimit

This option limits the number of concurrent HTTP requests. The default value is 400.

If you receive an error stating socket: too many open files, then you must reduce the number of concurrent HTTP requests. You can reduce the thread count to 1, which will cause the CLI to operate in single-threaded mode.

Note that reducing the thread count can increase latency.

Sample output

-requestLimit on vos origin verify live command:

```
vos origin verify live -egressIP=origin-media-01.vos.video -requestLimit=20
```

Too many files open error:

```
apples-MacBook-Pro:~ pmpoqa$ ./vos origin verify live -egressIP=dtvn-live-
sponsored.akamaized.net
SERVICE NAME          ORIGIN CHANNEL ID          STATE
LIVE URL
Get http://dtvn-live-sponsored.akamaized.net/Content/DASH_dash.wv/Live/
channel(TruTVHD.gmott.1080.mobile) /
manifest.mpd: dial tcp 23.72.94.115:80: socket: too many open files
Error during dtvn-live-sponsored.akamaized.net verification
```

CLI configuration commands

You must configure the VOS CLI before you can perform VOS operations.

- [vos config](#)
- [vos config init](#)
- [vos config show](#)

vos config

Use the available subcommands to create and edit the CLI configuration file, `vos.json`.

Sample output

```
[vagrant@2bd6ac8909e1 ~]$ vos config
NAME:
    VOS CLI config - provide credentials for connection with VOS
USAGE:
    VOS CLI config command [command options] [arguments...]
COMMANDS:
    show    shows actual connection info, credentials in vos.json

init    generates new vos.json, to provide credentials and required VOS instance u
rl, please, edit vos.json
OPTIONS:
    --help, -h    show help
```

vos config init

This command generates a config file that you must edit with the VOS instance URL, login credentials, and optional settings.

Note

Before 0.1.0.0-eng.245, the configuration file was saved to the directory where the VOS CLI binary is located. As of 0.1.0.0-eng.245, the location of the configuration file was changed to the *current working directory*. If you change directory using the console, you must re-execute this command from the new directory.

Options

-instanceURL=	Use this option to provide the VOS instance URL.
-optionalCommands=	Boolean flag. Pass this option to make vos.json include a list of optional commands that can be made visible and enabled by changing corresponding values from false to true. For example, vos service bulkcreate.
-requestDebug=	Boolean flag. This option creates a log of all requests and responses for troubleshooting purposes. Use only if requested by Harmonic technical support. This option was introduced in 0.1.0.0-eng.271.

Tip

As an alternative to passing these parameters at the command line, you may add them to vos.json.

Sample output

```
[vagrant@2bd6ac8909e1 trunk]$ vos config init new config file created,
please, edit credentials in /vagrant/dev/cli_app/trunk/vos_cli/cli/bin/vos.json

[vagrant@aa5465975a40 trunk]$ vos config init -instanceUrl=https://
media-01.vos.video
new config file created with provided instance URL,
you can edit instance URL in /vagrant/dev/cli_app/trunk/vos_cli/cli/bin/vos.json
```

Related information

[ignoreCertificate](#)

vos config show

This command returns the contents of the vos.json configuration file.

Sample output

```
[vagrant@b00e7e3bfd8b vos_cli_git]$ vos config show
{
    "ignoreCertificate": true,
    "instanceURL": "https://localhost:38001",
    "outputFile": "",
    "optionalCommands": {
        "csvBulkServiceCreation": false
    }
}
```

Authentication commands

VOS CLI supports basic authentication and Okta authorization at this time.

- [vos login](#)
- [vos login client](#)
- [vos login client authCode](#)
- [vos logout](#)
- [vos oauth](#)

`vos login`

Use this command to log in to the VOS CLI using basic authentication.

⚠ Note

This command does not support Okta mode.

Options

-login=	Provide the user login in the argument.
----------------	---

Usage guidelines

This command was introduced in 0.1.0.0-eng.66. To refresh the access token, use `vos oauth refresh_token`.

⚠ Note

To avoid a login error on Windows clients, you must use the default command line tool (cmd.exe), not the Cygwin command line tool. All commands are executed via vos.exe. For example, `vos.exe config init`.

Sample output

```
$ ./vos.exe login
Please, enter your password
***

[vagrant@aa5465975a40 trunk]$ vos login
Please, enter your login
user@harmonicinc.com.hlitdev5
Please, enter your password
*****
access_token obtained successfully and will expire 24 Oct 16 23:35 +0000

[vagrant@aa5465975a40 trunk]$ vos login --login=user@harmonicinc.com.hlitdev5
Please, enter your password
*****
access_token obtained successfully and will expire 24 Oct 16 23:35 +0000
```

vos login client

This command allows you to exchange a client ID and client Secret for an API access token (OAuth 2.0).

Note

You must register the CLI client before you can obtain an access token.

Options

-clientID=	Required. Provide the <i>clientID</i> for the VOS instance.
-clientSecret=	Required. Provide the <i>clientSecret</i> for the VOS instance.
-redirectURI=	Required. Provide the <i>redirectURI</i> for authentication (until 0.1.0.0-eng.372)

Usage guidelines

This command was introduced in 0.1.0.0-eng.328.

Info

This command performs Client Credential OAuth login flow until the **0.1.0.0-eng.372** version. After the **0.1.0.0-eng.372** version Authorization Code OAuth login flow is moved to [vos login client authCode](#) command.

Related information

[Registering the CLI client](#)

vos login client authCode

This command allows you to exchange a client ID, client Secret and Authorization code for an API access token (OAuth 2.0).

Note

You must register the CLI client before you can obtain an access token.

Options

-clientID=	Required. Provide the <i>clientID</i> for the VOS instance.
-clientSecret=	Required. Provide the <i>clientSecret</i> for the VOS instance.
-redirectURI=	Required. Provide the <i>redirectURI</i> for authentication.

Usage guidelines

This command was introduced in 0.1.0.0-eng.372.

Related information

[Registering the CLI client](#)

vos logout

This command clears the local credential cache.

Usage guidelines

This command was introduced in 0.1.0.0-eng.88.

Sample output

```
[vagrant@aa5465975a40 trunk] $ vos logout
[vagrant@aa5465975a40 trunk] $
```

vos oauth

This command enables you to manage OAuth operations on the VOS Cloud-Native Software via basic authentication.

⚠ Note

This command does not support Okta mode.

Sample output

```
[vagrant@7b900f10224b trunk]$ vos oauth
NAME:
      VOS CLI oauth - OAuth operations with VOS RT
USAGE:
      VOS CLI oauth command [command options] [arguments...]
COMMANDS:
refresh_token, rtoken creates clientId and clientSecret, use it to create refresh_token in authorization code flow
OPTIONS:
--help, -h show help
```

vos oauth refresh_token

This command generates a clientId, clientSecret, and temporary refresh_token valid for 30 days for OAuth authorization code flow.

The command output can be used to update Asset Acquisition on AWS Lambda or any other application registered with the VOS Cloud-Native Software.

⚠ Note

This command does not support Okta mode.

Options

-username=	Provide the username for the VOS Cloud-Native Software.
-password=	Provide the password for the VOS Cloud-Native Software.

Usage guidelines

This command was introduced in 0.1.0.0-eng.184.

Sample output

```
[vagrant@72f689c71a84 vos_cli_git]$ vos oauth rtoken
Please enter your username
user.firstlast@harmonicinc.com.hlitdev5
Please enter your password
*****
client_id          client_secret          refresh_token
b828d253-2e19-4f27-8416-361305c55044    fe5ee8088e80b97a95991fd68faed9b9    584bafc7-dab3-4085-b8dc-06494b94e1d5
```

Setup commands

Initialize a VOS Cloud-Native Software and register CloudLink instances.

- [vos init](#)

vos init

Use this command to perform first run on the VOS Cloud-Native Software.

 Note

This command supports basic authentication only. To perform first run in Okta mode, use `vos init key`.

Options

-requestLimit=	Change maximum possible concurrent HTTP requests. The default value is 5. A lower value will cause slower execution as limit to threads will apply (default: 0).
-ignoreCertificate=	Ignore invalid server certificate and continue REST calls. The default value is false.
-username=	Provide the Harmonic ID that is authorized to create users for the VOS Cloud-Native Software.
-password=	Password for Harmonic ID.

Usage guidelines

This command was first introduced in 0.1.0.0-eng.251.

Sample output

```
[vagrant@78aa4330fdd0 trunk]$ vos init -username=dev.reader@harmonicinc.com
-pw=*****
```

vos init key

If the VOS Cloud-Native Software is in Okta mode, use this command to complete initial setup. Please contact Harmonic technical support for the license key.

Options

-requestLimit=	Change maximum possible concurrent HTTP requests. The default value is 5. A lower value will cause slower execution as limit to threads will apply (default: 0).
-ignoreCertificate=	Ignore invalid server certificate and continue REST calls. The default value is false.
-licenseKey=	Provide the license key for your VOS account for authentication.
-username=	Provide the Harmonic ID that is authorized to create users for the VOS Cloud-Native Software.
-requireClientApp=	Create client app for setup purpose. The default value is false.
-clientId=	The Client ID is used for creating client app for setup purposes. Auto-generated if not specified.
-clientSecret=	The Client Secret is used for creating client app for setup purposes. Auto-generated if not specified.

Usage guidelines

This command was introduced in 0.1.0.0-eng.337.

vos init xos

Initialize setup of XOS environment by Harmonic License Key.

Options

-requestLimit=	Change maximum possible concurrent HTTP requests. The default value is 5. A lower value will cause slower execution as limit to threads will apply (default: 0).
-ignoreCertificate=	Ignore invalid server certificate and continue REST calls. The default value is false.
-username=	Provide the Harmonic ID that is authorized to create users for the XOS.

-password	Password for Harmonic ID. =
-licenseKey	Provide the license key for your XOS account for authentication. y=

Usage guidelines

This command was introduced in 0.1.0.0-eng.346.

vos init devops

Initialize setup of VOS environment by Harmonic DevOps.

Options

-requestLimit=	Change maximum possible concurrent HTTP requests. The default value is 5. A lower value will cause slower execution as limit to threads will apply (default: 0).
-ignoreCertificate=	Ignore invalid server certificate and continue REST calls. The default value is false.
-username=	Harmonic DevOps Username for authentication.
-password=	Harmonic DevOps Password + Security Token.
-accountPrefix=	Slack Channel Name Prefix of target account.
-environment=	Hub Environment to connect [playground / production]

Usage guidelines

This command was first introduced in 0.1.0.0-eng.276.

Sample output

```
[vagrant@localhost vos]$ vos init devops --username harmonicdevops@harmonicinc.com.hlitdev5 --password **** --accountPrefix sinc --environment playground
Instance https://sinc-01.nebula.video has been successfully initialized
```

vos init devops key

Initialize setup of VOS environment by Harmonic DevOps with License Key.

Options

-requestLimit=	Change maximum possible concurrent HTTP requests. The default value is 5. A lower value will cause slower execution as limit to threads will apply (default: 0).
-ignoreCertificate=	Ignore invalid server certificate and continue REST calls. The default value is false.
-licenseKey=	Harmonic DevOps Username for authentication.
-requireClientApp=	Create client app is for setup purposes. The default value is false.
-clientId=	The Client ID is used for creating client app for setup purposes. Auto-generated if not specified.
-clientSecret=	The Client Secret is used for creating client app for setup purposes. Auto-generated if not specified.

Usage guidelines

This command was first introduced in 0.1.0.0-eng.337.

Service and profile management commands

Create, activate, and verify services, register images and graphic templates, and so on. Bulk operations are supported.

- [vos source](#)
- [vos configure](#)
- [vos destination](#)
- [vos service](#)
- [vos channel](#)
- [vos origin](#)
- [vos atm](#)
- [vos capture](#)

VOS SOURCE

Use the available subcommands to obtain information about input sources.

Sample output

```
[vagrant@aa5465975a40 trunk]$ vos source
NAME:
    VOS CLI source - manage source
USAGE:
    VOS CLI source command [command options] [arguments...]
COMMANDS:
    list      list sources with Cloudlinks
OPTIONS:
    --help, -h  show help
```

vos source list

This command returns a list of sources associated with a CloudLink.

Usage guidelines

This command was introduced in 0.1.0.0-eng.85.

Sample output

Source_Id	Source Name	Source_Address	Cloudlink
02519abf-df33-4fff-8e3b-fb369a70d220	SaaSChannelCC-Source	224.1.1.3(10001)	uplinkLongevity
12b6dc5-54c3-4265-fca7-dc7d9518a66d	playoutSource	NO_UPLINK_INPUT	NO_UPLINK_INPUT
a80bf447-acd0-5fd0-e11f-cf7ed2a785d9	Uplink-SCTE35-Source	224.1.1.2(5678)	uplinkLongevity
d7f4a318-8444-c4fc-838c-7a2bfc65a64e	ATS Source	224.1.1.16(5678)	uplinkLongevity
ebcfecf3-e237-8258-e3a6-fa572660584b	IPTV-Source	NO_UPLINK_INPUT	NO_UPLINK_INPUT

vos configure

Use this command to configure VOS service add-ons.

- [vos configure pois](#)
- [vos configure images](#)
- [vos configure template](#)

vos configure pois

This command allows you to configure a default ESAM endpoint for the VOS Cloud-Native Software. You may override this setting at the service level.

Options

-pois	Required. Provide the ESAM endpoint.
--------------	--------------------------------------

vos configure images

This command allows you to register images in the Configure Channels app by specifying an input JSON file that contains a list of image URLs.

Options

-input	Provide the file path of the input JSON file.
---------------	---

Note

If an image from a given URL is already registered in the VOS Cloud-Native Software, it will not be registered second time. The existing ID will be printed in the command output.

Refer to the following sample JSON file:

```
[  
    "https://wikimedia.org/api/rest_v1/media/math/render/svg/  
41a5fdd58ef63fb5fbc4f4ae4c5eab7d65d91a49",  
    "https://wikimedia.org/api/rest_v1/media/math/render/svg/  
9afcb0b5abbdc66814d1e6c4961b3984c042950b"  
]
```

Sample output

```
[vagrant@c819221ab09c linux]$ vos configure images --input urls.json  
Image URL https://wikimedia.org/api/rest_v1/media/math/render/svg/  
41a5fdd58ef63fb5fbc4f4ae4c5eab7d65d91a49 is registered with ID 0d80963b-  
db4a-4669-bcd3-72c6eb519265  
Image URL https://wikimedia.org/api/rest_v1/media/math/render/svg/  
9afcb0b5abbdc66814d1e6c4961b3984c042950b is registered with ID 73428391-0f10-429  
8-abe0-44c45695f07d
```

vos configure template

This command allows you to register graphic templates with the VOS Cloud-Native Software by specifying an input JSON file that contains a list of image URLs.

Options

-input	Provide the file path of the input JSON file.
---------------	---

Note

If a graphic template from a given URL is already registered in the VOS Cloud-Native Software, it will not be registered a second time. The existing ID will be printed in the command output.

vos destination

Use the available subcommands to manage service destinations.

- [vos destination create](#)

vos destination create

This command allows you to create an Origin or ATS destination using a JSON file.

Options

-input	Required. Provide the location of the JSON configuration file.
---------------	--

Refer to the following JSON model when configuring the destination:

```
{
  "name": "atsDst",
  "type": "ATS",
  "labels": [ "one", "two" ],
  "outputs": [
    {
      "id": "f5a1f4f8-1435-fb4b-40b1-2415efb461f9",
      "ipSettings": {
        "ipAddress": "238.20.20.20",
        "ipPort": 2000,
        "cloudlinkGroupId": "64abccc9-9566-2b9d-5f59-62126bdf5e42"
      },
      "outputType": "HARMONIC_CLOUDLINK",
      "redundancyMode": "MANDATORY",
      "rank": 1
    }
  ],
  "destinationProfileId": "bbb267c1-0ab4-4250-86a0-ee1264c2f40a"
}
```

Sample output

```
[vagrant@c819221ab09c linux]$ vos destination create --input ./dest.json
```

VOS service

Use the available subcommands to manage VOS services.

Sample output

```
[vagrant@2bd6ac8909e1 trunk]$ vos service
NAME:
    VOS CLI service - managing services
USAGE:
    VOS CLI service command [command options] [arguments...]
COMMANDS:
    offline      switch off service
    online       switch on service
    restart      restart service: switch off, then switch on
    reconfig     Dump the service configuration. Delete & create & activate the service
    .
    list         list available services as '%ID %name %controlState'
    trace        trace where the service data flows through
OPTIONS:
    --id value   filter by id, whole id should be indicated
    --
    name value   filter by name, part of name can be indicated, changes will be applied to all values that contains indicated part
    --help, -h    show help
```

- [vos service list](#)
- [vos service offline](#)
- [vos service online](#)
- [vos service restart](#)
- [vos service reconfig](#)
- [vos service verify](#)
- [vos service trace](#)
- [vos service source](#)
- [vos service statistic](#)
- [vos service bulkcreate](#)

vos service list

This command returns a list of services that are configured for the VOS instance.

Sample output

```
[vagrant@72f689c71a84 vos_cli_git]$ vos srv list
Service_Name          Control_State   Service_Id
IPTV-Source-Harmonic IPTV SD 480i profile A-Downlink-Destination ACTIVATED 47435470-6a0f-9e9b-0da8-1ed0842929a7
SaaSChannelICC        ACTIVATED      4b40bd84-b8b8-4f66-9adf-69f243fc219a
SCTE35-Service         ACTIVATED      86ffa067-6514-dad9-366c-870f6ele9f82
playoutService         ACTIVATED      ed96f8e8-8649-49bc-1df9-f4c13d65c116
```

vos service offline

Use this command to offline an active service. Specify the service by its name or ID.

Options

-id=	Provide the whole value of the service ID.
-name=	Pass the service name using regular expression. All matching services will be updated.

Sample output

```
[vagrant@2bd6ac8909e1 trunk]$ vos service offline -id=a0d943af-159a-48b2-
bf59-2ff6df849c22
SUCCESS: service 'Harmonic NASA Sample' with Id a0d943af-159a-48b2-
bf59-2ff6df849c22 state has been changed to OFF
```

```
[vagrant@2bd6ac8909e1 trunk]$ vos service offline -name=Harmonic.*
Info: service 'Harmonic NASA Sample' with Id a0d943af-159a-48b2-
bf59-2ff6df849c22 is already in OFF state
SUCCESS: service 'Harmonic HVN 2 Sample' with Id 668658cb-bf9d-41b1-
aa65-3636bc4efe5d state has been changed to OFF
```

vos service online

Use this command to activate a service. An active service can receive, transcode, and output video.

Options

-id=	Provide the whole value of the service ID.
-name=	Pass the service name using regular expression. All matching services will be updated.

Sample output

```
[vagrant@2bd6ac8909e1 trunk]$ vos service online -id=a0d943af-159a-48b2-
bf59-2ff6df849c22
```

```
SUCCESS: service 'Harmonic NASA Sample' with Id a0d943af-159a-48b2-
bf59-2ff6df849c22 state has been changed to ACTIVATED
```

```
[vagrant@2bd6ac8909e1 trunk]$ vos service online -name=Harmonic.*
```

```
Info: service 'Harmonic NASA Sample' with Id a0d943af-159a-48b2-
bf59-2ff6df849c22 is already in ACTIVATED state
```

```
SUCCESS: service 'Harmonic HVN 2 Sample' with Id 668658cb-bf9d-41b1-
aa65-3636bc4efe5d state has been changed to ACTIVATED
```

vos service restart

Use this command to cycle a service off and then on.

Options

-id=	Provide the whole value of the service ID.
-name=	Pass the service name using regular expression. All matching services will be updated.

Sample output

```
[vagrant@2bd6ac8909e1 trunk]$ vos service restart -id=a0d943af-159a-48b2-
bf59-2ff6df849c22
```

```
SUCCESS: service 'Harmonic NASA Sample' with Id a0d943af-159a-48b2-
bf59-2ff6df849c22 state has been changed to OFF
```

```
SUCCESS: service 'Harmonic NASA Sample' with Id a0d943af-159a-48b2-
bf59-2ff6df849c22 state has been changed to ACTIVATED
```

```
[vagrant@2bd6ac8909e1 trunk]$ vos service restart -name=Harmonic.*
```

```
Info: service 'Harmonic HVN 2 Sample' with Id 668658cb-bf9d-41b1-
aa65-3636bc4efe5d is already in OFF state
```

```
Info: service 'Harmonic NASA Sample' with Id a0d943af-159a-48b2-
bf59-2ff6df849c22 is already in OFF state
```

```
SUCCESS: service 'Harmonic HVN 2 Sample' with Id 668658cb-bf9d-41b1-
aa65-3636bc4efe5d state has been changed to ACTIVATED
```

```
SUCCESS: service 'Harmonic NASA Sample' with Id a0d943af-159a-48b2-
bf59-2ff6df849c22 state has been changed to ACTIVATED
```

vos service reconfig

This command saves the service configuration locally before recreating it on the VOS Cloud-Native Software.

Options

-id=	Provide the whole value of the service ID.
-name=	Pass the service name using regular expression. All matching services will be updated.

Sample output

```
[vagrant@2bd6ac8909e1 trunk]$ vos service reconfig -id=a0d943af-159a-48b2-bf59-2ff6df849c22
SUCCESS: service 'Harmonic NASA Sample' with id a0d943af-159a-48b2-bf59-2ff6df849c22 has been deleted
SUCCESS: service 'Harmonic NASA Sample' with id a0d943af-159a-48b2-bf59-2ff6df849c22 has been recreated and activated
```

```
[vagrant@2bd6ac8909e1 trunk]$ vos service reconfig -name=Harmonic.*
SUCCESS: service 'Harmonic NASA Sample' with id a0d943af-159a-48b2-bf59-2ff6df849c22 has been deleted
SUCCESS: service 'Harmonic HVN 2 Sample' with id 668658cb-bf9d-41b1-aa65-3636bc4efe5d has been deleted
SUCCESS: service 'Harmonic NASA Sample' with id a0d943af-159a-48b2-bf59-2ff6df849c22 has been recreated and activated
SUCCESS: service 'Harmonic HVN 2 Sample' with id 668658cb-bf9d-41b1-aa65-3636bc4efe5d has been recreated and activated
```

vos service verify

Use this command to verify service statistics, such as service status, CC errors, and bitrates.

Options

-name=	Required. Pass the service name using regular expression. All matching services will be displayed.
---------------	--

Usage guidelines

This command was introduced in 0.1.0.0-eng.80.

Output will be color-coded and ordered by service name. CC errors are counted as an average from all sources (both active and standby).

Sample output

```
[vagrant@aa5465975a40 trunk]$ vos service verify --name=*
  SERVICE NAME  CONTROL STATE   STATUS CC ERROR      INPUT BITRATE (Mbps)  TRANSCODING BITRATE (Mbps)  NOTIFICATION #
  Live1          OFF        N/A    N/A           N/A             15.15            N/A                N/A
Harmonic NASA Sample ACTIVATED GREEN   8           N/A             15.04            0                  N/A
  Live2          OFF        N/A    N/A           N/A             10.99            N/A                N/A
Harmonic RVN 2 Sample ACTIVATED GREEN   8           10.99            11.13            0                  N/A
  Pearl          ACTIVATED RED     0           0.00            0.00             1
```

vos service trace

When you use the **-all** option, this command returns details for all configured services. When you specify a particular service, this command returns all configuration details for the service, including service ID, status, profiles, source information, and more.

Options

-all	Pass this option to see the following details for all services: service_name , control_state , CloudLink , elastic_address and streamprocess_address .
-id=	Specify a particular service by providing the whole value of the service ID.
-name=	Specify a particular service by providing the service name. Use regular expression. Only those details for the first matching service will be displayed.
-atsMulticastIP=	Specify a particular service by providing the input multicast IP address. Note that -atsMulticastPort= must be passed as well.
-atsMulticastPort=	Specify a particular service by providing the input multicast port number. Note that -atsMulticastIP= must be passed as well.

Usage guidelines

This command was introduced in 0.1.0.0-eng.147.

⚠ Note

Support for **-all** was introduced in 0.1.0.0-eng.196.

⚠ Note

Support for **-atsMulticastIP** and **-atsMulticastPort** was introduced in 0.1.0.0-eng.287.

Sample output

vos service trace -all sample output:

SERVICE_NAME	CONTROL_STATE	CLOUDLINK	ELASTIC_ADDRESS	STREAMPROCESS_ADDRESS
SCTE35-Service	ACTIVATED	uplinkLongevity	https://52.11.254.249(https://5 10.10.203.180	
SaaSChannelCC	ACTIVATED	uplinkLongevity	https://52.11.254.249(https://5 10.10.13.81	

vos service trace --name sample output (note that the output has been truncated):

```
[vagrant@aa5465975a40 trunk]$ vos service trace --name=.NEWS
Service matched:
Service_Name          Control_State Service_Id
=====
NEWS-IPTVSD25-NEWSIPTV ACTIVATED      6e10d9c4-bd1d-2441-e7d8-2d654c811e0d
-----
Number of Service Matched : 1
===== Details of service "NEWS-IPTV SD 25-NEWS IPTV" =====
Service Name       : NEWS-IPTV SD 25-NEWS IPTV
Service ID        : 6e10d9c4-bd1d-2441-e7d8-2d654c811e0d
Status            : ACTIVATED
Redundancy        : OFF
Transcoding Profile : IPTV SD 25 v2 (1241ed8b-e88b-5c25-ffd7-2fbb0f4f6587)
Destination Profile : IPTV Destination v3 (c20e19f1-af4b-3c84-9171-e260f394bdः)
Source_Id
Rank Source_Name   Source_Address Cloudlink
=====
=====
0731f366-67f3-b193-b6e3-92393e3bfcae 1     NEWS           229.1.1.3:10001 FEI CL
```

vos service source

Use the available subcommands to view and manage input sources.

This command was introduced in 0.1.0.0-eng.173.

Sample output

```
[vagrant@3951724dab0e trunk]$ vos srv src
NAME:
    VOS CLI service source - operations with service's sources
USAGE:
    VOS CLI service source command [command options] [arguments...]
COMMANDS:
    list      list service's sources by regex or name

    switch   switch between backup and primary sources of service, service defined by
             regex (will apply to all matched) or id
OPTIONS:
    --help, -h  show help
```

- [vos service source list](#)
- [vos service source switch](#)

vos service source list

Use this command to view the state of primary and backup input sources for a particular service.

Options

-name=	Pass the service name using regular expression.
---------------	---

Usage guidelines

This command was introduced in 0.1.0.0-eng.173.

Sample output

```
[vagrant@3951724dab0e trunk]$ vos srv src list -name=.
SERVICE NAME          PRIMARY      BACKUP
Harmonic HVN 2 Sample ACTIVE        NOT CONFIGURED
Harmonic NASA Sample  ACTIVE        STANDBY
```

vos service source switch

Use this command to switch input sources for a particular service.

Options

-name=	Pass the service name using regular expression.
---------------	---

Usage guidelines

This command was introduced in 0.1.0.0-eng.173.

Sample output

```
[vagrant@3951724dab0e trunk]$ vos srv src switch -name=service_1
Updated state:
SERVICE NAME          PRIMARY      BACKUP
Harmonic NASA Sample  STANDBY     ACTIVE
```

vos service statistic

Use this command to view statistics for a particular service, such as the number of CC errors over a 24-hour period.

This command was introduced in 0.1.0.0-eng.181. There are no options or arguments for this command.

Sample output

```
[vagrant@ccba894acd1f trunk]$ vos srv stat
NAME:
      VOS CLI service statistic - provides statistical information
USAGE:
      VOS CLI service statistic command [command options] [arguments...]
COMMANDS:
      ccerror, ccr  statistics on ccError per 1H, 12H, 24H
OPTIONS:
      --help, -h  show help
```

- [vos service statistic ccerror](#)

vos service statistic ccerror

Use this command to view the number of CC errors for a particular service over a 1-hour, 12-hour, and 24-hour time period. The CC error count reflects active sources only.

Options

-name=	Pass the service name using regular expression.
---------------	---

Usage guidelines

This command was introduced in 0.1.0.0-eng.181.

Sample output

```
[vagrant@ccba894acd1f trunk]$ vos srv stat ccr -name
SERVICE NAME CONTROL STATE    CC ERROR 1H    CC ERROR 12H    CC ERROR 24H
Demo Room      ACTIVATED        0            0            0
HK iNews        ACTIVATED        4            61           61
TOTAL          TOTAL           52           634          1210
```

vos service bulkcreate

This is an optional command, which is hidden by default. You must enable optional commands in `vos.json` in order to use this command.

Note

Successful service creation depends on valid configuration. Invalid service configuration will prevent further execution.

Options

-input=	Required. Indicates the path to the CSV configuration file.
-validateOnly	Validate service configuration without creating services. Note that some validations require interaction with the VOS Cloud-Native Software.
-validateInternal	Validate only what is possible without interaction with the VOS Cloud-Native Software.
-bulkWidth=	Limits the number of services that will be created concurrently.

Usage guidelines

This command was introduced in 0.1.0.0-eng.240.

Sample output

```
[vagrant@ccba894acd1f trunk]$ vos service bulkcreate -input=./config.csv
[vagrant@ccba894acd1f trunk]$ vos service bulkcreate -input=./config.csv - validateOnly
[vagrant@ccba894acd1f trunk]$ vos service bulkcreate -input=./config.csv - bulkWidth=10
```

Related information

[vos config init](#)
[vos service bulkcreate](#)

CSV configuration file format

The CSV file allows you to create services in bulk. It contains 46 total columns for service parameters, which must follow the prescribed sequence.

Sequence of columns in the CSV file:

```
Source 1 name  
Source 1 CloudLink name  
Source 1 multicast address  
Source 1 multicast address port  
Source 1 multicast address port SSM 1  
Source 1 multicast address port SSM 2  
Source 1 program number  
Source 1 video ES type  
Source 1 video PID  
Source 1 Audio 1 language  
Source 1 Audio 1 ES type  
Source 1 Audio 1 PID  
Source 1 Audio 1 Nielsen  
Source 1 Audio 2 language  
Source 1 Audio 2 ES type  
Source 1 Audio 2 PID  
Source 1 Audio 2 Nielsen  
Source 2 name  
Source 2 CloudLink name  
Source 2 multicast address  
Source 2 multicast address port
```

Source 2 multicast address port SSM 1
Source 2 multicast address port SSM 2
Source 2 program number
Source 2 video ES type
Source 2 video PID
Source 2 Audio 1 language
Source 2 Audio 1 ES type
Source 2 Audio 1 PID
Source 2 Audio 1 Nielsen
Source 2 Audio 2 language
Source 2 Audio 2 ES type
Source 2 Audio 2 PID
Source 2 Audio 2 Nielsen
OTT destination name
OTT destination profile ID
OTT destination publishing name
ATS destination name
ATS destination profile ID
ATS destination CloudLink name
ATS multicast address
ATS multicast base port
Service name
Service transcoding profile ID
Ad insertion acquisition point ID
Blackout slate image ID

vos channel

⚠ Note

This command is applicable to VOS360 and for your reference only.

Use the available subcommands to manage channels in VOS360.

Sample output

```
[vagrant@2bd6ac8909e1 trunk]$ vos channel
NAME:
    VOS CLI channel - managing channels
USAGE:
    VOS CLI channel command [command options] [arguments...]
COMMANDS:
    offline      switch off channel
    online       switch on channel
    restart      restart channel: switch off, then switch on
    reconfig     Dump the channel configuration. Delete & create the channel.
    list         list available channels as '%ID %name %controlState'
OPTIONS:
    --id value    filter by id, whole id should be indicated
    --
    name value   filter by name, part of name can be indicated, changes will be applied to all values that contains indicated part
    --help, -h    show help
```

- [vos channel list](#)
- [vos channel offline](#)
- [vos channel online](#)
- [vos channel restart](#)
- [vos channel reconfig](#)

vos channel list

⚠ Note

This command is applicable to VOS360 and for your reference only.

Use this command to list the ID, control state, and name of all channels.

Sample output

ID	CONTROL_STATE	NAME
1977739a-9d8c-11e5-8994-feff819cdc9f	OFF	Harmonic NASA Sample
bce2939a-b715-45ef-9fb4-9d929bc17453	OFF	Harmonic HVN 2 Sample
fa9eecc5-10e9-4a80-2326-9b627f46b7d1	ACTIVATED	Test-Channel-225-4567

vos channel offline

⚠ Note

This command is applicable to VOS360 and for your reference only.

Use this command to turn the channel control state to OFF.

Options

-id=	Provide the whole value of the channel ID.
-name=	Pass the channel name using regular expression. All matching channels will be updated.

Sample output

```
[vagrant@2bd6ac8909e1 trunk]$ vos channel offline -id=a0d943af-159a-48b2-bf59-2ff6df849c22
```

```
SUCCESS: channel 'Harmonic NASA Sample' with Id a0d943af-159a-48b2-bf59-2ff6df849c22 state has been changed to OFF
```

```
[vagrant@2bd6ac8909e1 trunk]$ vos channel offline -name=Harmonic.*
```

```
Info: channel 'Harmonic NASA Sample' with Id a0d943af-159a-48b2-bf59-2ff6df849c22 is already in OFF state
```

```
SUCCESS: channel 'Harmonic HVN 2 Sample' with Id 668658cb-bf9d-41b1-aa65-3636bc4efe5d state has been changed to OFF
```

vos channel online

⚠ Note

This command is applicable to VOS360 and for your reference only.

Use this command to turn the channel state to ON.

Options

-i	Provide the whole value of the channel ID.
d =	

-n	Pass the channel name using regular expression. All matching channels will be updated.
a	
m	
e	
=	

Sample output

```
[vagrant@2bd6ac8909e1 trunk]$ vos channel online -id=a0d943af-159a-48b2-
bf59-2ff6df849c22
SUCCESS: channel ice 'Harmonic NASA Sample' with Id a0d943af-159a-48b2-
bf59-2ff6df849c22 state has been changed to ACTIVATED

[vagrant@2bd6ac8909e1 trunk]$ vos channel online -name=Harmonic.*
Info: channel 'Harmonic NASA Sample' with Id a0d943af-159a-48b2-
bf59-2ff6df849c22 is already in ACTIVATED state
SUCCESS: channel 'Harmonic HVN 2 Sample' with Id 668658cb-bf9d-41b1-
aa65-3636bc4efe5d state has been changed to ACTIVATED
```

vos channel restart

⚠ Note

This command is applicable to VOS360 and for your reference only.

Use this command to stop the channel and start it again.

Options

-id=	Provide the whole value of the channel ID.
-name=	Pass the channel name using regular expression. All matching channels will be updated.

Sample output

```
[vagrant@2bd6ac8909e1 trunk]$ vos channel restart -id=a0d943af-159a-48b2-
bf59-2ff6df849c22
SUCCESS: channel 'Harmonic NASA Sample' with Id a0d943af-159a-48b2-
bf59-2ff6df849c22 state has been changed to OFF
SUCCESS: channel 'Harmonic NASA Sample' with Id a0d943af-159a-48b2-
bf59-2ff6df849c22 state has been changed to ACTIVATED
```

```
[vagrant@2bd6ac8909e1 trunk]$ vos channel restart -name=Harmonic.*
Info: channel 'Harmonic HVN 2 Sample' with Id 668658cb-bf9d-41b1-
aa65-3636bc4efe5d is already in OFF state
Info: channel 'Harmonic NASA Sample' with Id a0d943af-159a-48b2-
bf59-2ff6df849c22 is already in OFF state
SUCCESS: channel 'Harmonic HVN 2 Sample' with Id 668658cb-bf9d-41b1-
aa65-3636bc4efe5d state has been changed to ACTIVATED
SUCCESS: channel 'Harmonic NASA Sample' with Id a0d943af-159a-48b2-
bf59-2ff6df849c22 state has been changed to ACTIVATED
```

vos channel reconfig

⚠ Note

This command is applicable to VOS360 and for your reference only.

This command saves the channel configuration locally before recreating it on the VOS.

Options

-id=	Provide the whole value of the channel ID.
-name=	Pass the channel name using regular expression. All matching channels will be updated.

Sample output

```
[vagrant@2bd6ac8909e1 trunk]$ vos channel reconfig -id=a0d943af-159a-48b2-
bf59-2ff6df849c22
SUCCESS: channel 'Harmonic NASA Sample' with id a0d943af-159a-48b2-
bf59-2ff6df849c22 has been deleted
SUCCESS: channel 'Harmonic NASA Sample' with id a0d943af-159a-48b2-
bf59-2ff6df849c22 has been recreated and activated
```

```
[vagrant@2bd6ac8909e1 trunk]$ vos service reconfig -name=Harmonic.*  
SUCCESS: channel 'Harmonic NASA Sample' with id a0d943af-159a-48b2-  
bf59-2ff6df849c22 has been deleted  
SUCCESS: channel 'Harmonic HVN 2 Sample' with id 668658cb-bf9d-41b1-  
aa65-3636bc4efe5d has been deleted  
SUCCESS: channel 'Harmonic NASA Sample' with id a0d943af-159a-48b2-  
bf59-2ff6df849c22 has been recreated and activated  
SUCCESS: channel 'Harmonic HVN 2 Sample' with id 668658cb-bf9d-41b1-  
aa65-3636bc4efe5d has been recreated and activated
```

vos origin

Use the available subcommands to manage Origin streams.

Usage guidelines

This command was introduced in 0.1.0.0-eng.53.

Sample output

```
[vagrant@aa5465975a40 trunk]$ vos origin  
NAME:  
    VOS CLI origin - managing origin  
USAGE:  
    VOS CLI origin command [command options] [arguments...]  
COMMANDS:  
    verify  verify origin command  
OPTIONS:  
    --help, -h  show help
```

- [vos origin verify](#)
- [vos origin verify live](#)
- [vos origin verify catchup](#)
- [vos origin verify startover](#)

vos origin verify

Use the available subcommands to verify live, catchup, and startover streams.

Sample output

```
[vagrant@aa5465975a40 trunk]$ vos origin verify
NAME:
    VOS CLI origin verify - verify origin command
USAGE:
    VOS CLI origin verify command [command options] [arguments...]
COMMANDS:
    live    check live origin streams on mirrors by egressIP
OPTIONS:
    --help, -h  show help
```

vos origin verify live

Use this command to verify that live HLS/DASH streams are correctly transmitted to the Video Delivery Network (VDN).

Streams may be in one of the following two states:

- Green: Playlist is available
- Red: No playlist is published for the current stream

Options

-egressIP=	Provide the live output URL.
-------------------	------------------------------

Sample output

vos or verify live -egressIP=origin-saas-longevity-01.nebula.video				
1/3				
2/3				
3/3				
SERVICE NAME		ORIGIN CHANNEL ID	STATE	HTTP CODE
IPTV-Source-Harmonic	IPTV SD 480i pr	47435470-6a0f-9e9b-0da8-led0842929a7	GREEN	200
	SaaSChannelCC	4b40bd84-b8b8-4f66-9adf-69f243fc219a	GREEN	200
	SaaSChannelCC	4b40bd84-b8b8-4f66-9adf-69f243fc219a	GREEN	200
				http://origin-saas-longevity-01.nebula.video/.../index.m3u8
				http://origin-saas-longevity-01.nebula.video/.../manifest.mpd
				http://origin-saas-longevity-01.nebula.video/.../index.m3u8

vos origin verify catchup

Use this command to verify catchup output streams. The VOS server time will be used for setting the start and end times.

Options

-egressIP=	Required. Provide the catchup output URL.
-startTime=	Set the time at which you want the timeshift content to begin. The default is -10m from the current time.
-endTime=	Set the time at which you want the timeshift content to end. The default is -9m from the current time.

Usage guidelines

This command was introduced in 0.1.0.0-eng.152.

Sample output

```
[vagrant@72f689c71a04 vos cli git]$ vos or verify catchup -egressIP=origin-saas-longevity-01.nebula.video --startTime=-15m
Used VOS RT time: 2018-06-05T07:50:27Z, in Unix: 15281856027
1/4
2/2
SERVICE NAME      STATE    HTTP CODE   CATCH UP URL
SasChannelCC      404      http://origin-saas-longevity-01.nebula.video/Content/DASH/Catchup/channel[name=4a0d8d84-8bb8-4f6e-9ad1-09f143fc219a].startime=152818412700000124.manifest.mpd
SasChannelC       404      http://origin-saas-longevity-01.nebula.video/Content/DASH/Catchup/channel[name=4a0d8d84-8bb8-4f6e-9ad1-09f143fc219a].starttime=152818412700000124.endtime=152818448700000124.manifest.mpd
No http://origin-saas-longevity-01.nebula.video with such ID (Content/DASH/Catchup/channel[name=4a0d8d84-8bb8-4f6e-9ad1-09f143fc219a].starttime=152818412700000124.endtime=152818448700000124)/manifest.mpd was found. No entity was found by URL: http://origin-saas-longevity-01.nebula.video/Content/DASH/Catchup/channel[name=4a0d8d84-8bb8-4f6e-9ad1-09f143fc219a].starttime=152818412700000124.endtime=152818448700000124.manifest.mpd. 6/404 Not Found 404 HTTP/1.1 1 1 map[Retry-Count:[0] Etag:[Thu, 01 Jan 1970 00:00:00 GMT] Connection:[keep-alive] Content-Length:[0] Cache-Control:[no-cache="set-cookie"] Date:[Tue, 05 Jun 2018 07:50:28 GMT] Set-Cookie:[ANESELB=00A3319516DAE6745F7025F0A|EA7176ADEAD699C8B905160ECC49CALM=1|JSESSIONID=44BCF90E88B89483982;PATH=/;MAX-AGE=7200]] () 0 {} false false map[] 0xc4202a4200 <nil>
Error during origin-saas-longevity-01.nebula.video verification
```

vos origin verify startover

Use this command to verify startover streams. The VOS server time will be used for setting the start time.

Options

-egressIP=	Required. Provide the startover output URL.
-startTime=	Set the time at which you want the timeshift content to begin. The default is -10m from the current time.

Usage guidelines

This command was introduced in 0.1.0.0-eng.152.

Sample output

```
[vagrant@72f689c71a04 vos cli git]$ vos or verify startover -egressIP=origin-ghostbusters-01.nebula.video --startTime=-15m
Used VOS RT time: 2018-06-05T08:04:45Z, in Unix: 1528185885
System time received and used
1/4
2/4
3/4
4/4
SERVICE NAME      STATE    HTTP CODE   START OVER URL
Harmonic HW 2 Sample GREEN   200   http://origin-ghostbusters-01.nebula.video/Content/H_5_hls_00/StartOver/channel[name=4842b2b7-f886-4d0e-9066-be69c7c337cc].starttime=15281849500001647/index.m3u8
Harmonic HW 2 Sample GREEN   503   http://origin-ghostbusters-01.nebula.video/Content/DASH/dash_00/StartOver/channel[name=4842b2b7-f886-4d0e-9066-be69c7c337cc].starttime=15281849500001647/manifest.mpd
Harmonic NASA Sample GREEN   503   http://origin-ghostbusters-01.nebula.video/Content/H_5_hls_00/StartOver/channel[name=d4d2af2-9691-4711-aedc-692d4a872563].starttime=152818495000017181/index.m3u8
No http://origin-ghostbusters-01.nebula.video with such ID (Content/DASH/dash_00/StartOver/channel[name=4842b2b7-f886-4d0e-9066-be69c7c337cc].starttime=15281849500001647)/manifest.mpd was found. No entity was found by URL: http://ula.video/Content/DASH/dash_00/StartOver/channel[name=4842b2b7-f886-4d0e-9066-be69c7c337cc].starttime=15281849500001647/manifest.mpd. 6/503 Service Unavailable 503 HTTP/1.1 1 1 map[Set-Cookie:[ANESELB=13A3ED01128021559E02E5A0E53C0AF4660A0A9F4200B1E045A52529E53661E651285CF0044A10235D04C10E666733A0C8PD74AF7D0A198A;PATH=/;MAX-AGE=7200] Content-Length:[0] Retry-Count:[0] Etag:[Thu, 01 Jan 1970 00:00:00 GMT] Last-Modified:[GMT] Connection:[keep-alive] Cache-Control:[max-age=0 no-cache="set-cookie"] () 0 {} false false map[] 0xc4201cc300 <nil>
Error during origin-ghostbusters-01.nebula.video verification
```

vos atm

Use the available subcommands to manage ATM filtering profiles.

Sample output

```
[vagrant@78aa4330fdd0 trunk]$ vos atm
NAME:
    VOS CLI atm - manage ATM profiles
USAGE:
    VOS CLI atm command [command options] [arguments...]
COMMANDS:
create  create new ATM profile in VOS runtime      save      save current configuration of ATM profiles on VOS runtime
OPTIONS:
--help, -h  show help
```

- [vos atm save](#)
- [vos atm create](#)

vos atm save

This command allows you to save profiles to the local client.

Options

-output=	Specify the output file name. Profiles are output in JSON format.
-----------------	---

Usage guidelines

This command was introduced in 0.1.0.0-eng.217.

Sample output

```
[vagrant@78aa4330fdd0 trunk]$ vos atm save -output=atmOutput.json
Successfully saved ATM profiles to atmOutput.json
```

vos atm create

This command allows you to save a filtering profile configuration file to the VOS Cloud-Native Software.

Options

-input=	Specify the name of the configuration file. Only JSON files are supported.
----------------	--

Usage guidelines

This command was introduced in 0.1.0.0-eng.217.

Sample output

```
[vagrant@78aa4330fdd0 trunk]$ vos atm create -input=atmOutput.json
Successfully added ATM profiles to VOS RT
```

vos capture

The available subcommands allow you to manage network traffic capture files (.pcap).

Note

The `vos capture` command is supported on Linux clients only.

Sample output

```
[vagrant@aa5465975a40 trunk]$ vos capture
NAME:
    VOS CLI capture - manage captured files
USAGE:
    VOS CLI capture command [command options] [arguments...]
COMMANDS:
    extract  extract payload from pcap file      replay    replay pcap file on nic
    upload
OPTIONS:
    --help, -h  show help
```

- [vos capture extract](#)
- [vos capture replay](#)
- [vos capture upload](#)

vos capture extract

This command allows you to extract and merge network payload (*.ts) in a single file from network traffic capture files (*.pcap) that contain video traffic (*.ts files). The result can be used to replay in a video player such as VLC.

To create the input file, use the `tcpdump` command. For example:

```
sudo tcpdump -i eth0 host 225.1.1.5 and port 4545 -w e2e.pcap -c 900
```

where `e2e.pcap` is the result file, and 900 is the number of packets to be captured. For RTP packets, you may specify multiple ports.

Options

-inputPath=	Specify the path to the .pcap file.
--------------------	-------------------------------------

-outputPath=	Specify the output filepath. Note that executing this command will override the output file.
-ip=	For MBTS input: Enter the destination IP address associated with the payload you wish to extract.
-port=	For MBTS input: Enter the destination port associated with the payload you wish to extract. Defaults to 0.

Usage guidelines

Both UDP and RTP packets are supported. For MBTS inputs, the VOS CLI will extract all payload filtered by the destination IP and port.

This command has the following history:

- This command was introduced in 0.1.0.0-eng.105 (UDP support only).
- RTP support was added in 0.1.0.0-eng.120.
- Support for MBTS inputs was added in 0.1.0.0-eng.270.

Sample output

```
[vagrant@2e05cd8eb37d trunk]$ vos capture extract --
inputPath=cut_mbts_227.1.1.1_2001_2002.pcap --outputPath=mbts.ts --port=2001 --
ip=227.1.1.1
Payload extracted successfully to mbts.ts
```

vos capture replay

Use this command to replay a .pcap file.

Options

-inputPath=	Required. Specify the path to the .pcap file.
-nic=	Required. Specify the local Ethernet port for replaying the file.
-timeout=	Specify a duration (in seconds) for the replay.

Usage guidelines

This command was introduced in 0.1.0.0-eng.107.

Sample output

```
[vagrant@aa5465975a40 trunk]$ sudo vos_cli/bin/vos capture replay --  
inputPath=udp.pcap --nic=eth0 --timeout=30s  
Avg packet rate 1000/s  
rate 218980 kB/sec - sent 218980/1332 kB - 164300/1000 packets -  
remaining time 260ms, streaming time 1.000001294s  
rate 211776 kB/sec - sent 423552/1332 kB - 317789/1000 packets -  
remaining time -739ms, streaming time 2.000002726s  
rate 212296 kB/sec - sent 636889/1332 kB - 477856/1000 packets -  
remaining time -1739ms, streaming time 3.000008989s  
rate 215604 kB/sec - sent 862416/1332 kB - 647067/1000 packets -  
remaining time -2739ms, streaming time 4.000015072s  
rate 215705 kB/sec - sent 1078528/1332 kB - 809215/1000 packets -  
remaining time -3739ms, streaming time 5.000019442s  
rate 214486 kB/sec - sent 1286919/1332 kB - 965571/1000 packets -  
remaining time -4739ms, streaming time 6.000021906s  
rate 214233 kB/sec - sent 1499632/1332 kB - 1125168/1000 packets -  
remaining time -5739ms, streaming time 7.000029248s  
rate 213731 kB/sec - sent 1709853/1332 kB - 1282896/1000 packets -  
remaining time -6739ms, streaming time 8.000033328s  
rate 213439 kB/sec - sent 1920956/1332 kB - 1441285/1000 packets -  
remaining time -7739ms, streaming time 9.000042109s  
rate 212525 kB/sec - sent 2125257/1332 kB - 1594572/1000 packets -  
remaining time -8739ms, streaming time 10.000042737s  
rate 212733 kB/sec - sent 2340073/1332 kB - 1755747/1000 packets -  
remaining time -9739ms, streaming time 11.000049262s  
rate 211986 kB/sec - sent 2543838/1332 kB - 1908631/1000 packets -  
remaining time -10739ms, streaming time 12.000052121s  
rate 212675 kB/sec - sent 2764780/1332 kB - 2074403/1000 packets -  
remaining time -11739ms, streaming time 13.000055843s  
rate 212055 kB/sec - sent 2968783/1332 kB - 2227465/1000 packets -  
remaining time -12742ms, streaming time 14.00300244s  
rate 211217 kB/sec - sent 3168255/1332 kB - 2377128/1000 packets -  
remaining time -13742ms, streaming time 15.003003915s  
rate 210622 kB/sec - sent 3369965/1332 kB - 2528471/1000 packets -  
remaining time -14742ms, streaming time 16.003007581s  
rate 210320 kB/sec - sent 3575453/1332 kB - 2682647/1000 packets -  
remaining time -15742ms, streaming time 17.003012185s  
rate 210277 kB/sec - sent 3785003/1332 kB - 2839872/1000 packets -  
remaining time -16742ms, streaming time 18.003013191s  
rate 210022 kB/sec - sent 3990425/1332 kB - 2993999/1000 packets -  
remaining time -17742ms, streaming time 19.003015442s  
rate 209218 kB/sec - sent 4184367/1332 kB - 3139513/1000 packets -  
remaining time -18742ms, streaming time 20.003015958s  
rate 209620 kB/sec - sent 4402040/1332 kB - 3302832/1000 packets -  
remaining time -19742ms, streaming time 21.003017957s
```

```

rate 209677 kB/sec - sent 4612910/1332 kB - 3461046/1000 packets -
remaining time -20742ms, streaming time 22.003019694s
rate 209540 kB/sec - sent 4819428/1332 kB - 3615996/1000 packets -
remaining time -21742ms, streaming time 23.003021263s
rate 209490 kB/sec - sent 5027771/1332 kB - 3772315/1000 packets -
remaining time -22742ms, streaming time 24.003026442s
rate 209942 kB/sec - sent 5248565/1332 kB - 3937976/1000 packets -
remaining time -23742ms, streaming time 25.003032878s
rate 209910 kB/sec - sent 5457665/1332 kB - 4094863/1000 packets -
remaining time -24742ms, streaming time 26.003034365s
rate 210120 kB/sec - sent 5673240/1332 kB - 4256608/1000 packets -
remaining time -25742ms, streaming time 27.003039821s
rate 210153 kB/sec - sent 5884302/1332 kB - 4414967/1000 packets -
remaining time -26742ms, streaming time 28.003040225s
rate 210376 kB/sec - sent 6100907/1332 kB - 4577484/1000 packets -
remaining time -27742ms, streaming time 29.003041491s
Finished by timeout in 30.000012436s

```

vos capture upload

This command allows you to upload a .pcap file to a content management provider such as Box.com.

You must configure external storage information for this VOS instance before you can use this command. Contact Harmonic technical support for assistance.

Note

The source file will be deleted after you execute this command.

Options

-inputPath	Required. Specify the path to the .pcap file.
-------------------	---

Usage guidelines

This command was introduced in 0.1.0.0-eng.169. The command output may be used to download the file from the content management provider (0.1.0.0-eng.188 and later). Note that the Bearer token expires after one hour. To retrieve a new Bearer token, execute GET /customer-date/v1/storage from the Developer API app.

Sample output

vos capture upload command:

```
[vagrant@2e8cbcec88d9 trunk]$ vos capture upload -inputPath udp.pcap
curl -L https://api.box.com/2.0/files/172573833549/content -
H "Authorization: Bearer FT4hUkDIUYo9h2GnXwCNSWnIeShB31fk" -o udp.pcap
```

Download cURL command:

```
[vagrant@2e8cbcec88d9 trunk]$ curl -L https://api.box.com/2.0/files/
172573833549/content -
H "Authorization: Bearer FT4hUkDIUYo9h2GnXwCNSWnIeShB31fk" -o udp.pcap
% Total      % Received % Xferd  Average Speed   Time     Time     Time
Current                                         Dload  Upload   Total Spent  Left
Speed
0       0      0      0      0      0      0      0      --::--  0:00:01  --::--      0
100 1341k  100 1341k    0      0    412k      0      0:00:03  0:00:03  --::--  1359
```

Asset management commands

Upload file-based assets to pre-configured S3 Bucket storage.

- [vos asset](#)
- [vos asset upload](#)

vos asset

This command allows you to manage file-based assets in the Asset Acquisition app.

Sample output

```
[ee00fdd0f8cc vos_cli]$ vos asset
NAME:
  VOS CLI asset - manage asset acquisition
USAGE:
  VOS CLI asset command [command options] [arguments...]
COMMANDS:
  upload  upload AA asset to storage
OPTIONS:
  --help, -h  show help
```

vos asset upload

Use this command to upload an asset to a configured S3 Bucket source.

Options

-inputPath=	Specify the path of the file you wish to upload.
--------------------	--

Usage guidelines

This command was introduced in 0.1.0.0-eng.217.

Sample output

```
[ee00fdd0f8cc vos_cli]$ vos asset upload -inputPath artI.ts
```

Maintenance and monitoring commands

Set nodes to maintenance mode, create and restore system backups, manage alarms, and so on.

- [vos node](#)
- [vos notification](#)

vos node

Use the available subcommands to manage VOS nodes.

Sample output

```
[vagrant@78aa4330fdd0 trunk]$ vos nd -h
NAME:
      VOS CLI node - manage nodes for maintenance purposes
USAGE:
      VOS CLI node command [command options] [arguments...]
COMMANDS:
status    list status of nodes that were taken under maintenance. Will only list nodes that were down for maintenance before
      down    Change indicated nodes state to DOWN
      up     Change indicated nodes state to UP
OPTIONS:
      --help, -h  show help
```

- [vos node down](#)
- [vos node status](#)
- [vos node up](#)
- [vos snapshot](#)

vos node down

Use this command to take down one or more nodes in a VOS for maintenance.

Options

-hostname=	Specify the hostname of the node you wish to take down. To specify multiple hostnames in the same command, add each with an additional flag. You can find hostnames of available nodes in a node management tool such as the AWS console.
-f=	Boolean value. Use only if all nodes passed in the command must be forced down.
-fh=	Boolean value. Use only if you need to force an individual node into the down state.

Usage guidelines

After a node is taken down, its state will change to **Pending**, then **Draining**, and finally **Down**.

This command was introduced in 0.1.0.0-eng.255.

Sample output

```
[vagrant@78aa4330fdd0 trunk]$ vos nd down -hostname=vos-node-i-00eeee081b3456942 -fh=true -hostname=vos-node-i-03e43773582a272d4 -fh=false
HOSTNAME          TARGETSTATE   REPORTEDSTATE  FORCE    ERRORS
IP
vos-node-i-081b3456942      DOWN        PENDING       true
vos-node-i-03582a272d4      DOWN        PENDING       false
HOSTNAME          TARGETSTATE   REPORTEDSTATE  FORCE    ERRORS
IP
vos-node-
i-001b3456942      DOWN        DRAINING      true           10.10.3.39
vos-node-
i-03e43a272d4      DOWN        DRAINING      false          10.10.2.224
HOSTNAME          TARGETSTATE   REPORTEDSTATE  FORCE    ERRORS
IP
vos-node-
i-001e3456942      DOWN        DOWN          true           10.10.3.39
vos-node-
i-03e82a272d4      DOWN        DOWN          false          10.10.2.224
```

vos node status

Use this command to check the status of nodes that were previously taken down for maintenance.

Usage guidelines

This command was introduced in 0.1.0.0-eng.255.

Sample output

Nodes are down for maintenance:

```
[vagrant@78aa4330fdd0 trunk]$ vos nd status
HOSTNAME          TARGETSTATE   REPORTEDSTATE  FORCE
ERRORS
IPvpos-node-i-001b3456942    DOWN        DOWN       true      10.10.3.39
vos-node-i-03e82a272d4      DOWN        DOWN      false     10.10.2.224
```

All nodes are currently up:

```
[vagrant@78aa4330fdd0 trunk]$ vos nd status
No node state was changed for maintenance, all are in UP state
You can change node status by hostname to down.
Hostname can be found in node management tool: e.g. AWS console, Hello VOS...
```

vos node up

After a node has been taken down for maintenance, use this command to return the node to the up state.

Options

-hostname=	Specify the hostname of the node you wish to bring back up. To specify multiple hostnames in the same command, add each with an additional flag. You can find hostnames of available nodes in a node management tool such as the AWS console.
-------------------	---

Usage guidelines

This command was introduced in 0.1.0.0-eng.255.

Sample output

```
[vagrant@78aa4330fdd0 trunk]$ vos nd up -hostname=vos-node-i-00eeee081b3456942 - hostname=vos-node-i-03e43773582a272d4
HOSTNAME           TARGETSTATE   REPORTEDSTATE   FORCE   ERRORS
IP
vos-node-
i-0081b3456942    UP          DOWN            true      10.10.3.39
vos-node-
i-03e582a272d4    UP          DOWN            false     10.10.2.224
HOSTNAME           TARGETSTATE   REPORTEDSTATE   FORCE   ERRORS
IP
vos-node-
i-0081e3456942    UP          UP              true      10.10.3.39
vos-node-
i-03e82a272d4    UP          UP              false     10.10.2.224
```

vos snapshot

Use the available subcommands to manage your VOS system backups.

Sample output

```
[vagrant@2bd6ac8909e1 trunk]$ vos snapshot
NAME:
      VOS CLI snapshot - create snapshot of services and channels
USAGE:
      VOS CLI snapshot command [command options] [arguments...]
COMMANDS:
      save  Trigger database backup to microsite
      load  Restore configuration from database backup on microsite by snapshot-
            id
      list  List all available database backups on microsite as %instance-
            id':'+backupId %runTimeName %date %softwareVersion, where instance-
            id':'+backupId = snapsho-id
OPTIONS:
      --snapshot-id value  id of snapshot to load
      --help, -h           show help
```

- [vos snapshot list](#)
- [vos snapshot save](#)
- [vos snapshot load](#)
- [vos snapshot status](#)

vos snapshot list

You can use this command to obtain the **Snapshot ID** of a particular backup you wish to restore. Snapshots are listed in reverse chronological order.

Sample output

SNAPSHOT-ID					
DATE	SOFTWARE_VERSION	SIZE	RUNTIME_NAME		
42dcc2d2-8dda-4327-873c-ddf6c8e01d4e:52881	eng.990 108832	02 Oct 17 16:31 +0000	Harmonic VOS (Hostname: dell-3)	1.3.0.0-	
42dcc2d2-8dda-4327-873c-ddf6c8e01d4e:52858	eng.990 108104	01 Oct 17 16:31 +0000	Harmonic VOS (Hostname: dell-3)	1.3.0.0-	
42dcc2d2-8dda-4327-873c-ddf6c8e01d4e:52833	eng.990 107365	30 Sep 17 16:31 +0000	Harmonic VOS (Hostname: dell-3)	1.3.0.0-	
42dcc2d2-8dda-4327-873c-ddf6c8e01d4e:52800	eng.990 106597	29 Sep 17 16:31 +0000	Harmonic VOS (Hostname: dell-3)	1.3.0.0-	
42dcc2d2-8dda-4327-873c-ddf6c8e01d4e:52765	eng.990 105864	28 Sep 17 16:31 +0000	Harmonic VOS (Hostname: dell-3)	1.3.0.0-	
42dcc2d2-8dda-4327-873c-ddf6c8e01d4e:52729	eng.990 105127	27 Sep 17 16:31 +0000	Harmonic VOS (Hostname: dell-3)	1.3.0.0-	
42dcc2d2-8dda-4327-873c-ddf6c8e01d4e:52691	eng.990 104397	26 Sep 17 16:31 +0000	Harmonic VOS (Hostname: dell-3)	1.3.0.0-	
42dcc2d2-8dda-4327-873c-ddf6c8e01d4e:52665	eng.990 103663	25 Sep 17 16:31 +0000	Harmonic VOS (Hostname: dell-3)	1.3.0.0-	
42dcc2d2-8dda-4327-873c-ddf6c8e01d4e:52645	eng.990 102933	24 Sep 17 16:31 +0000	Harmonic VOS (Hostname: dell-3)	1.3.0.0-	

vos snapshot save

This command creates a system backup and saves it to the Harmonic Hub.

Sample output

```
[vagrant@2bd6ac8909e1 trunk]$ vos snapshot save
{"enabled":true,"nextBackupTime":"2016-10-03T14:06:48Z","periodMs":86400000}
Success
```

vos snapshot load

This command will restore a particular backup to the VOS.

Options

-snapshot-id=

Required. Enter the full snapshot ID. You can obtain the snapshot ID from vos snapshot list.

Sample output

```
[vagrant@2bd6ac8909e1 trunk]$ vos snapshot load -snapshot-
id=0b71a9e5-4ab6-4a72-8109-85f609b81bb3:52754
Restoring database snapshot started, use 'vos snapshot status' command to track
status
```

vos snapshot status

This command shows the status of a snapshot restoration in progress.

Usage guidelines**⚠ Note**

This command updates the status every five seconds, until it will become IDLE. To continue using the VOS CLI, you must log in again.

This command was introduced in 0.1.0.0-eng.71.

Sample output

```
[vagrant@2bd6ac8909e1 trunk]$ vos snapshot status
STATE           INSTANCE_ID          BACKUP_ID    ERROR_MESSAGE
IN_PROGRESS    0b71a9e5-4ab6-4a72-8109-85f609b81bb3 52754        <nil>
<nil>          <nil>            <nil>        <nil>
IN_PROGRESS    0b71a9e5-4ab6-4a72-8109-85f609b81bb3 52754        <nil>
<nil>          <nil>            <nil>        <nil>
IDLE           <nil>            <nil>        <nil>
Database snapshot restored
```

vos notification

Use the available subcommands to manage VOS alarms and alerts.

Sample output

```
[vagrant@aa5465975a40 trunk]$ vos notification
NAME:
    VOS CLI notification - manage notifications
USAGE:
    VOS CLI notification command [command options] [arguments...]
COMMANDS:
list          list active notifications as '%Title %ObjectName %Severity %Duration'
schedulefix  schedule fix for all active notifications
resolve       resolve zombie active notifications
OPTIONS:
--help, -h   show help
```

- [vos notification list](#)
- [vos notification resolve](#)
- [vos notification schedulefix](#)

vos notification list

This command returns all active notifications. Options are available to filter notifications by severity level, title, and object name.

Options

-severity=	Filter by severity level. The following values are supported: <ul style="list-style-type: none"> • CRITICAL • WARNING • IMPORTANT
-title=	Type the title using regular expression.
-objectName=	Type the object name using regular expression. The object name is the text that precedes the colon (:) in the notification message. You can view the notification in the Notifications app, or in the GET /notification/v1/notifications call response.

Usage guidelines

This command was introduced in 0.1.0.0-eng.114.

Sample output

```
[vagrant@aa5465975a40 trunk]$ vos notification list
There are no active notifications for VOS instance that match filters.
[vagrant@aa5465975a40 trunk]$ vos notification list --severity=WARN --
title=Stream --objectName=bce
      Title          Severity      Object Name
Stream generation failed    WARNING     Stream bce2939a-
b715-45ef-9fb4-9d929bc17453
```

vos notification resolve

Use this command to resolve active notifications by object name.

Options

-objectName=	Required. Type the object name using regular expression. All matching notifications will be resolved.
---------------------	---

Usage guidelines

This command was introduced in 0.1.0.0-eng.114.

Sample output

```
[vagrant@aa5465975a40 trunk]$ vos notification resolve -objectName=bce2939a.*
Resolved 1 notifications
```

vos notification schedulefix

Use this command to schedule a fix for all active notifications. By default, the fix will be scheduled 10 minutes from the current time on the VOS.

Usage guidelines

This command was introduced in 0.1.0.0-eng.114.

Sample output

```
[vagrant@aa5465975a40 trunk]$ vos notification schedulefix
Successfully scheduled fix for all active notifications.
```