aws elemental

AWS ELEMENTAL DELTA

RELEASE NOTES, SOFTWARE VERSION 2.3.1

July, 2019

Contents

SOFTWARE UPGRADES

You can find the currently installed version of AWS Elemental Delta software at the bottom of the user interface or by typing the command:

```
cat /opt/elemental_se/versions.txt
```

LIVE TO VOD AND VOD CATALOG PRE-UPGRADE INSTRUCTIONS

Use this procedure if any of the nodes that you're upgrading to Delta version 2.3 meet all of the following conditions:

- They are currently on a Delta version earlier than 2.2.0.
- They use Live to VOD or Live to VOD Catalog features.

1. Run the following cleanup scripts:

```
>> cd /opt/elemental_se/web/vendor/gems/delta/script/

>> ./clean-orphans.rb --clean-orphaned-filters
```

Warning: This step can take multiple hours to complete. Make sure you perform cleanup within a maintenance window.

If your system uses Live to VOD Catalog, use the following scripts as well:

```
>> cd /opt/elemental_se/web

>> RAILS_ENV=production rails runner ./vendor/gems/delta/script/clean_l2vc_orphans.rb
```

2. Wait for segment cleanup to complete.

   To view progress, navigate to the **Delta Content Deletion** graph on the Stats tab in the Delta web interface. Wait for Delta to reestablish a normal 60 second cleanup cadence. This indicates that the content files on the disk that were bound to the leaked filters are done being cleaned up.

3. Stop elemental_se using the following command:

```
sudo service elemental_se stop
```

4. Do a full vacuum of the database to recover any wasted space. Use the following commands:

```
>> psql web_production

>> vacuum full;
```

   Note: You will get a number of "superuser" warnings at this point. Ignore these.

```
>> \q
```

5. Upgrade the Delta node as outlined in AWS Elemental Delta 2.3 Upgrade Guide.

DOWNGRADE FROM VERSION 2.3 EXPECTED ERROR

If you downgrade from AWS Elemental Delta 2.3 to an earlier version, you will receive a RubyVersionMismatch error in the logs. This is expected and does not affect the downgrade process.

The full error is as follows:

```
/opt/elemental-ruby/lib/ruby/gems/1.9.1/gems/bundler-1.11.2/lib/bundler/definition.rb:402:in
`validate_ruby!': Your Ruby version is 1.9.3, but your Gemfile specified 2.3.6
(Bundler::RubyVersionMismatch)
```

ADDITIONAL RESOURCES

For information on upgrading and configuring, see the following guides.

For Information on	See
General information on install options	Installing Elemental Products – Orientation Guide (available on the AWS Elemental User Community at https://community.elemental.com/).
Upgrading to version 2.3.x	AWS Elemental Delta 2.3 Upgrade Guide
Configuring an Appliance Edition for the first time	AWS Elemental Delta 2.3 Configuration Guide
Installing on a physical machine with a node-locked license for the first time	AWS Elemental Delta Install Guide: Node-Locked License
Installing on a virtual machine with a node-locked license	AWS Elemental Install Guide: Node-locked License Deployments on a VM
Configuring the node after install	AWS Elemental Delta 2.3 Configuration Guide

RELEASE NOTES - 2.3.1

KNOWN ISSUES IN 2.3.1

Downgrades from 2.3.1

Because of a configuration change, downgrading from Delta 2.3.1 to a previous version can cause the RabbitMQ filter_stats queue to stop updating. To prevent this, delete the queue before you run the *prepare_for_downgrade* script on each node.

To delete the queue

1. Start the downgrade process as described in the AWS Elemental Delta version 2.3 Upgrade Guide.
2. At each "Downgrade [the node]" step, ensure that the node is stopped. Use the following command if not:

```
[elemental@hostname ~]$ sudo service elemental_se stop
```

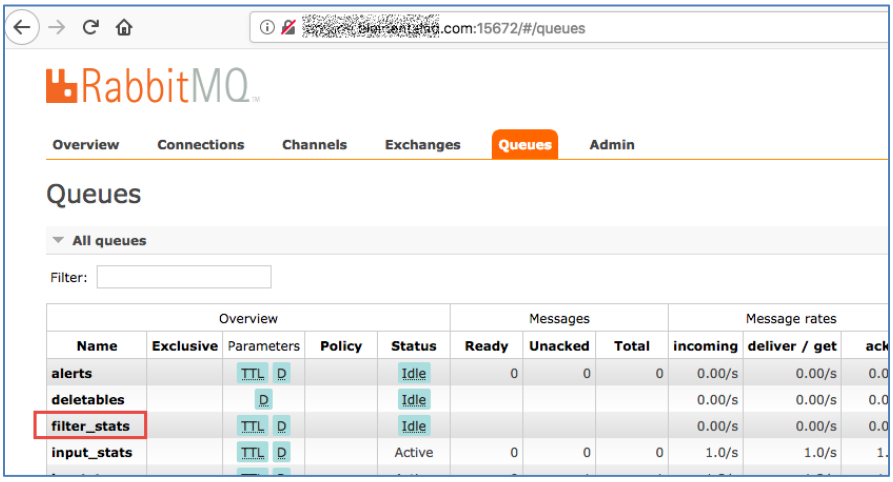
3. Locate the Rabbit username and password:

```
[elemental@hostname ~]$ cd /etc/elemental/rabbitmq
```

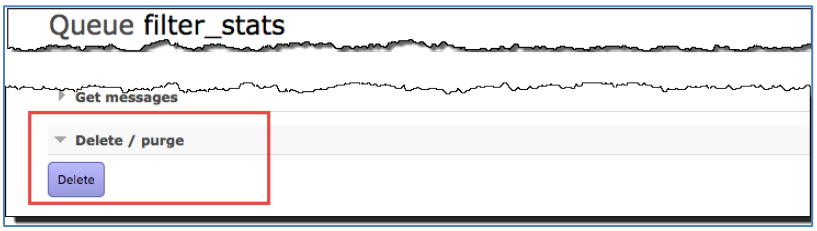
4. Navigate to the RabbitMQ web interface using the following address:

```
http://<delta.hostname>:15672
```

5. Log in to the Rabbit interface and choose the **Queues** tab.
6. Choose **filter_stats.**



7. Expand the **Delete/purge** section and choose **Delete**.



8. Complete the downgrade process.

HLS Streams with ID3 Data

In Delta versions 2.3 and 2.3.1, HLS output streams carrying ID3 metadata are incorrectly labeled, which can lead to playback issues on some devices. Previously, these streams correctly used the identifier 21, which playback devices recognize as metadata. Starting with 2.3, though, Delta incorrectly modifies the identifier to a false, unknown number in HLS outputs.

If you have playback issues because of the mislabeled stream type, contact AWS Elemental Support through your company's Private Space on the AWS Elemental User Community (https://community.elemental.com).

PRODUCT ENHANCEMENTS IN 2.3.1

Environment variables

The 2.3.1 Delta release introduced the following environment variables:

- `MSS_LEGACY_AUDIO_DEDUPLICATION`: controls when Delta performs de-deduplication on audio tracks (DELTA-8151).
  - If set to `true` (default), Delta performs de-dup when the audio tracks have the same language.
  - If set to `false`, Delta considers tracks for de-duplication if they have all of the same settings (language, codec, bit rate, and so on).
- `PUT_CONTENT_PROTECTIONS_ON_ADAPTATION_SET`: controls where Delta puts the `<ContentProtection>` element in encrypted DASH manifests (DELTA-8256).
  - If set to `true`, Delta puts `<ContentProtection>` under `<AdaptationSet>`.
  - If set to `false` (default), Delta puts `<ContentProtection>` under `<Representation>`.

To change default behaviors

1. Edit the files to add the following lines of text before the start ( ) function:
   - For `MSS_LEGACY_AUDIO_DEDUPLICATION`, edit `/etc/init.d/elemental_se` and add the following line of text:

```
export MSS_LEGACY_AUDIO_DEDUPLICATION=false
```

   - For `PUT_CONTENT_PROTECTIONS_ON_ADAPTATION_SET`, edit `/etc/init.d/elemental_se` and `/etc/init.d/httpd` and add the following line of text:

```
export PUT_CONTENT_PROTECTIONS_ON_ADAPTATION_SET=true
```

2. Restart httpd and elemental_se with the following commands:

```
sudo service httpd restart
sudo service elemental_se restart
```

Manifest treatment

DELTA-8252 Added `CHANNELS` attribute to `EXT-X-MEDIA` tag for HLS/ts and CMAF/HLS content.

RESOLVED ISSUES IN 2.3.1

Audio and Subtitles

DELTA-8135 Resolved issue causing subtitles in MSS outputs to appear late and clear too quickly.

DELTA-8151 Added an environment variable that tells Delta not to de-duplicate audio tracks that have the same language. See Product Enhancements in 2.3.1 for more information.

DELTA-8196 Resolved issue causing Delta to miscalculate the audio sample rate when the UDP ingest is restarted, resulting in `Ingest warning: Audio sample rate […] doesn't match previous sample rate […]`.

Clusters

DELTA-7302 Resolved issue causing `delete stat_monitor` errors to fill postgresql logs during cluster failover.

Encryption

DELTA-8083 Resolved issue with missing EXT-X_KEY tags on some HLS encrypted endpoints.

DELTA-8256 Added an environment variable that tells Delta to place the `<ContentProtection>` element in the `<Representation>` instead of the `<AdaptationSet>`. See Product Enhancements in 2.3.1 for more information.

General

DELTA-7893 Resolved issue causing repeated `signal 11` errors in the logs after environment variables are set.

DELTA-8201 Resolved issue causing `Caught signal 11` errors when audio and video tracks are misaligned in source content.

Live-to-VOD, VOD, and VOD Catalog

DELTA-8179 Resolved issue with live-to-VOD where, when URL start/end time parameters are in the past, live manifests are generated instead of VOD (`ENDLIST` is missing from HLS manifests and DASH manifests are dynamic, for example).

DELTA-8118 Resolved issue with VOD and VOD Catalog content missing audio tracks when default stream sets are used.

DELTA-8209 Resolved issue preventing Delta from deleting tracks with end times older than the live-to-VOD time to keep window. The extra tracks caused problems with default stream set functionality, resulting in error 404s on playback.

DELTA-8216 Resolved issue preventing scrub during playback of ingested MSS VOD content from Apple players.

DELTA-8217 Resolved issue causing video stutter during playback of ingested MSS VOD content.

DELTA-8220 Resolved issue causing `DEMUXER warning...` and `Error creating demuxer…` messages to fill Delta logs during playback of ingested MSS VOD content.

DELTA-8244 Resolved issue of incomplete PSSH values on VOD and VOD Catalog content.

DELTA-8288 Corrected HTTP error received when a start URL parameter is set in the future. Before, an HTTP 500 was received. It's now a 404.

Output Filters

DELTA-7505 Resolved issue occasionally causing child manifests to stop updating when there is a Blackout filter in the filter chain.

DELTA-8237 Resolved issue where, when a filter chain is created with output templates and includes the File Copy output filter, the custom URI sometimes returns a 404 error during playback.

Rabbit-MQ

DELTA-8177 Resolved issue causing a large number of messages to accumulate in the filter_stats queue, causing node communication in a cluster to fail or become inconsistent.

SCTE-35

DELTA-8180 Resolved issue with intermittent error 404s in HLS manifests and `Invalid framerate [0/1]…` errors in the logs when SCTE-35 ad markers immediately follow a full segment.

RELEASE NOTES - 2.3

ESSENTIAL NOTES FOR 2.3

This section describes changes in behavior and other important notices about the AWS Elemental Delta 2.3 release.

AWS Credentials Behavior Change

As of the 2.3 release, you can no longer view or modify the existing secret key for an AWS user. If you need to change the secret key on an existing user, delete that user and it back with the new secret key.

AWS Elemental Delta in AWS Elemental Cloud

The AWS Elemental Delta 2.3 release is not available on the AWS Elemental Cloud Platform.

Important notes:

- Starting with 2.3, no new features will be released for AWS Elemental Delta on the Cloud Platform. If you want to use any of the features from Product Enhancements in 2.3, you must use an on premises version of Delta.
- AWS Elemental Delta versions prior to 2.3 will remain available on the Cloud Platform.
- All AWS Elemental Cloud customers should plan to transition their packaging workflows to AWS Elemental MediaPackage (https://aws.amazon.com/mediapackage/). If you have specific questions, please reach out to your account manager.

Empty DVB Captions

Due to the way AWS Elemental Live sends subtitle information and how Delta processes subtitles, DVB-SUB and DVB-TXT captions on HLS and MSS outputs are often empty. DELTA-7929 implements a partial fix to this problem. To further reduce the possibility of empty captions, we recommend that your event in Live has a video buffer size that is equal to the maximum bitrate. So if your maximum video bitrate is 4MB, your buffer should be set to 4MB as well. This effectively sets your buffer to 1 second and will help ensure that all of your captions are output correctly.

Frame Accuracy Support Update

Frame Accuracy is supported only when AWS Elemental Delta is used with AWS Elemental Live encoders that are running version 2.13.

Reactivated Streams Behavior Change

If a stream is still within the content to keep window, the stream maintains its place in egress even after being reactivated. This means that if stream <id>_1 is deactivated and reactivated within the content window, it will still be <id>_1 when it's reactivated. Previously, the stream took a new position if reactivated.

If the stream is reactivated once the content window has passed, Delta assigns it a new position.

VOD Catalog $name$ Recommendation

To ensure correct playback, we recommend that you don't name endpoint filters in a way that leads to one name being a subset of another. For example, on a VOD Catalog output template, you have the following naming scheme:

- For the custom URL of one endpoint filter, you enter `$name$`.
- For the custom URL of another endpoint filter, you enter `$name$_encrypted`.

Delta replaces the $name$ token with the value from the Name field on the Live to VOD Catalog output filter. In this example, that value is `sports` so your filters are named ending with `sports.m3u8` and `sports_encrypted.m3u8`.

When fulfilling playback requests, Delta recognizes partial matches. So in this example, if a request comes in for the `sports_encrypted.m3u8` endpoint, Delta sees that as a partial match for `sports.m3u8`. Delta serves the content for the `sports.m3u8` endpoint even though the request was for the `sports_encrypted.m3u8` content.

To avoid this content confusion, if you append a value after a replacement token for one endpoint filter on an output template, do the same for all of the endpoints with that same extension (.m3u8, .ism/Manifest, .mpd and so on). This way, none of the names are a subset of any others so partial matches won't result in the wrong content being served.

PRODUCT ENHANCEMENTS IN 2.3

Captions and Subtitles

AWS Elemental Delta now supports the following:

- Embedding PNG image-based captions into the ID3 tags of fMP4 and TS-based content.
- Passthrough of embedded 608/708 captions to MP4 and fMP4 content. Additionally, manifests that include 608/708 captions are now decorated with an `Accessibility schemeIdUri` tag.

Additionally, ID3 timestamp handling has been improved so that captions clear from the viewing screen as expected during playback.

Cluster

When a leader node fails over to the secondary, you can now view the pave progress of the new leader node. You can view pave progress from the web interface and command line:

- From the web interface, go to the **Nodes** page. From here, the secondary node displays the pave progress.
- From the command line, view the log output for the new leader. The progress of the pave is described in info messages.

CMAF Output

CMAF outputs now support HDR-10 content.

DASH Output

You can now specify if you want your DASH manifest to be included in a single period (existing, default behavior), or if you want it separated into multiple periods based on SCTE35 ad markers. These markers are then passed through to the output manifest to signal ad breaks. To use multiple periods in DASH, set the **multiperiod** setting on the DASH output filter. For more information, see Dynamic Adaptive Streaming over HTTP (DASH)-ISO Output Filter in the AWS Elemental Delta 2.3 User Guide.

Important Multi-period DASH is not available in AWS Elemental Cloud versions of AWS Elemental Delta. For multi-period functionality in a cloud offering, see AWS Elemental MediaPackage.

DRM

The following DRM enhancements are now available:

- AWS Elemental Delta now works with Secure Packager and Encoder Key Exchange (SPEKE) through Common Encryption, HLS Encryption, and PlayReady output filters. For more information about SPEKE, see What Is Secure Packager and Encoder Key Exchange?.
- On HLS Encryption when you use Irdeto as a keyprovider, you can now use the Irdeto CA protection type. To use this feature, select CA Key Server on the HLS Encryption output filter. For more information, see HLS Encryption Output Filter in the AWS Elemental Delta 2.3 User Guide.

Stream Sets

The following enhancements to stream sets are now available:

- Three new environment variables are added for HLS content:
  - You can specify if the default stream set behavior is to mux audio with video tracks with no renditions groups (default, existing behavior) or to demux the audio and video tracks and put the audio tracks in renditions groups based on codec.
  - You can tell Delta to create an audio-only HLS stream set from UDP ingest. Delta doesn't support ingesting audio-only playlists for UDP, so this variable enables Delta to use the first audio track to create an audio-only playlist.
  - You can tell Delta to output all DVB-SUB captions from the source content as ID3 captions. If you don't set the environment variable and you use default stream sets, then Delta puts the captions in caption-only rendition group (existing default behavior).

  For more information about setting these environment variables, see the HLS Stream Sets section of *Creating HLS Package Output Filters* in the AWS Elemental Delta 2.3 User Guide.
- AWS Elemental Delta will continue to egress content when the encoder drops one or more sub-streams. Previously, Delta would mark the channel as Live-Stale when a sub-stream is no longer being received. When a channel is Live-Stale, it is unavailable for egress. With 2.3, as long as at least one sub-stream is available, the content will remain Live-Active.

VOD

AWS Elemental Delta now supports ingesting MSS VOD content where the audio segment size differs from the video segment size. This enhancement fixes the following known issue noted in the Delta 2.2.x release notes:

Customers implementing VOD workflows (watch folder, VOD catalog ingest) using Microsoft Smooth Streaming (MSS) based content should ensure that the segment durations for all tracks in the source material are aligned. Delta will not properly ingest content that has a differing segment cadence between video, audio, or caption tracks and will result in unpredictable playback behavior when the content is packaged for egress. The workaround is to ensure the encoder aligns all tracks in MSS content intended for VOD ingest into Delta.

VOD Catalog

You can now encrypt VOD content after ingest, when it is in storage, or "at rest." Enable this feature from the input filter. For more information, see the following sections in the AWS Elemental Delta 2.3 User Guide:

- *HTTP Put Input Filter*
- *MSS Input Filter*
- *WebDAV Input Filter*
- *VOD Catalog Input Filter*

KNOWN ISSUES IN 2.3

Downgrades

If you downgrade from AWS Elemental Delta 2.3 to an earlier version, you will receive a RubyVersionMismatch error in the logs. This is expected and does not affect the downgrade process.

The full error is as follows:

```
/opt/elemental-ruby/lib/ruby/gems/1.9.1/gems/bundler-1.11.2/lib/bundler/definition.rb:402:in
`validate_ruby!': Your Ruby version is 1.9.3, but your Gemfile specified 2.3.6
(Bundler::RubyVersionMismatch)
```

HLS Streams with ID3 Data

In Delta versions 2.3 and 2.3.1, HLS output streams carrying ID3 metadata are incorrectly labeled, which can lead to playback issues on some devices. Previously, these streams correctly used the identifier 21, which playback devices recognize as metadata. Starting with 2.3, though, Delta incorrectly modifies the identifier to a false, unknown number in HLS outputs.

If you have playback issues because of the mislabeled stream type, contact AWS Elemental Support through your company's Private Space on the AWS Elemental User Community (https://community.elemental.com).

Live to VOD

DELTA-4681	With a Live to VOD output filter, start/end URL parameters are incompatible with the Ad Removal output filter. Delta may allow you to create this combination of filters, but content playback will be unstable.

Live to VOD Frame Accuracy

The frame-accurate Live to VOD (L2V) in Delta 2.1.3 currently supports h.264/AVC encoded streams. Customers should be aware that h.265 is not currently supported.

Additionally, frame accuracy is not compatible with content that has been encoded with reference B-frames (DELTA-6739).

RESOLVED ISSUES IN 2.3

Amazon S3

DELTA-7490 Resolved issue causing failed uploads to Amazon S3 on large MP4 live-to-VOD files.

Bitrate Selector Output Filter

DELTA-6201 Resolved issue with bitrate selector endpoints displaying duplicate bitrates in the web interface when the HLS input is restarted.

DELTA-7646 Resolved issue with bitrate selector endpoints displaying duplicate bitrates in the web interface after encoder failover with UDP input.

Captions and Subtitles

DELTA-8033 Resolved issue causing DVB-SUB captions to be delayed up to 3 seconds behind audio on HLS and MSS endpoints.

DELTA-7929 To help resolve issues with empty DVB-SUBs on output, added efficiencies in how Delta handles captions packets. For more information about fully resolving the empty subtitles, see Empty DVB Captions in *Essential Notes for 2.3*.

DELTA-7482 Resolved issue hindering DVB-TXT language codes from being displayed in HLS subtitle rendition groups.

DELTA-7723 Resolved issue preventing ExoPlayer from being able to decode embedded captions on encrypted DASH endpoints.

DELTA-7726 Resolved issue causing incorrect language code for captions in MSS content.

DELTA-7810 Resolved missing schemeID flag from DASH manifests, which was preventing ExoPlayer from displaying subtitles.

DELTA-7859 Resolved issue preventing DVB-SUB captions from being displayed on encrypted HLS content.

DELTA-7877 Resolved issue preventing DVB-SUB and DVB-TXT captions from being displayed on encrypted HLS and MSS content.

DELTA-7895 Resolved issue causing AWS Elemental Delta to drop the IGMP connection when DVB-SUB and DVB-TXT content is present.

DELTA-7920 Resolved issue causing captions to be encrypted in HLS content, rendering them unusable.

DELTA-8047 Helped to reduce CPU load by decreasing the compression on image-based captions. Lower compression means that there's a slight increase in size of the captions. If this increase is a problem for your workflow, you can manually set the PNG_COMPRESSION_LEVEL environment variable. The default is 1. Previously, it was 6. You can use a value from 1 to 9.

Clusters

DELTA-7548 Resolved issue causing high CPU usage and slow queries on clustered egress nodes. Eventually, the slow queries would lead to a large enough gap that caused the egress node to drop from the cluster and pave.

DELTA-7889 Reduced time it takes for the old leader node to pave itself post-failover.

DELTA-8049 Resolved issue causing the secondary Delta node to become unresponsive if postgreSQL stops on the leader node.

DASH Output

DELTA-5637 Resolved drifting availabilityStartTime (AST) in DASH live content, causing playback issues for some players. On live active content being ingested in real-time, the AST will no longer drift.

DELTA-7164 When standard aspect ratio is anything other than 1:1, added "sar" value to DASH representation information to ensure consistent resolutions between DASH and other packaging formats.

DELTA-7696 Resolved DASH playback failure on Roku devices due to invalid availabilityStartTime format.

DELTA-7847 Resolved issue causing a memory leak from the File Copy output filter when it's downstream of a DASH output filter that has a captions track in custom stream sets.

MSS Output

DELTA-7395 Resolved playback failure from an MSS output filter when there are a different number of segments across bitrates.

Performance

DELTA-6350 Resolved database backup issue that could cause the AWS Elemental Delta node to become unresponsive.

DELTA-7432 Improved web interface load time when there are many endpoints on a contents. To see improvement on API responses, use the `?slim=true` or `?slim_filters=true` argument on GET contents requests. For more information, see the Product Enhancements in 2.3 section of these release notes.

DELTA-7791 Improved CPU usage and time to load the VOD Catalog Contents page when many contents are present.

DELTA-7993 Prevented unnecessary Phusion Passenger security checks from causing extra traffic from Delta.

DELTA-8026 Resolved issue where restarting elemental_se could cause delivery of stale content from endpoints that use filter playlists and have a long keep window.

DELTA-8073 Resolved issue where a high rate of incoming SCTE markers could cause 100% CPU usage.

Stream Sets

DELTA-7523 Resolved issue causing incomplete custom stream sets in encrypted HLS manifests when an output filter is modified or restarted.

VOD and Live-to-VOD Output

DELTA-7304 Resolved issue with duration mismatches on VOD content, caused by Delta identifying the wrong AAC audio profile.

DELTA-7588 Resolved "crit Filter" errors and subsequent intermittent 404s on playback of live-to-VOD content cached from Amazon S3.

VOD Catalog

DELTA-6045 Resolved issue preventing the `name` and `resource_id` values from persisting on ingested VOD Catalog content.

DELTA-6517 Resolved issue with VOD Catalog cache filling up and causing memory errors.

DELTA-7286 Resolved issue causing short manifests when MSS live content is being promoted to VOD Catalog.

DELTA-7502 Resolved issue causing playback failure of encrypted HLS content from pre-promotion valias VOD Catalog URLs.

DELTA-7927 Resolved issue causing the fn replacement token to not be replaced correctly on MP4 and MPEG-TS endpoints.

VOD Catalog and Live to VOD Output

DELTA-7306 Resolved issue causing incorrect live-to-VOD and VOD Catalog start times following a UDP input drop.

Web Interface

DELTA-7438 Corrected issue preventing contents search results from being displayed. Previously, if you did a search and weren't on the first page of contents, you wouldn't see the results list.