



Transcoder SDK Certification Process – Vendors

Instructions to Validate the Correct Implementation of the
Nielsen ID3 Software Development Kit

Revision F



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Revision History

Revision	Date	Description
A	2015-09-25	Initial version
B	2015-11-06	Revised forms
C	2016-03-03	Clarified content to be sent to Nielsen
D	2017-02-03	Revised for Mpeg-DASH support.
E	2018-08-06	Updated for clarity.
F	2018-09-19	Updated Engineering Forum links



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Purpose

The purpose of this certification process is to create transcoder output data that allows Nielsen to validate the proper implementation of the Nielsen PCM-to-ID3 software development kit (SDK) into the code base of a vendor's transcoder application.

This certification process requires collaborative efforts between you and Nielsen to be successful. If you have questions, errors, or challenges at any point, do not hesitate to contact your Nielsen Engineering representative.

Terminology

This document uses the following terms:

- *Device* refers to your equipment and/or software that is being tested for certification as a Nielsen ID3 Tag Inserter.
- *You* refers to the vendor.
- *End user* refers to the user of your application.
- *Nielsen audio watermark* refers to Nielsen Audio Encoding System 2 (NAES 2) audio code and Nielsen Watermark audio code.
 - *Watermark*, as a noun, refers to these same audio codes.
 - *Watermark*, as a verb, refers to the insertion of Nielsen audio watermarks into content.
- *DASH* refers to MPEG-DASH

Related Documents

For more information on the integration of the Nielsen PCM-to-ID3 SDK into your software, see the *Nielsen PCM-to-ID3 SDK Developer's Guide Revision N* or later.

For instructions on using the Nielsen ID3 Tag Validator and analyzing the output, see the *Nielsen ID3 Tag Validator User Guide*.

If you need a copy of either of these documents, contact your Nielsen Engineering representative to request a copy.

Nielsen PCM-to-ID3 Overview

Nielsen television audience measurement of mobile and computer viewing is based on the identification of Nielsen audio watermarks in the broadcast content. For the watermark to pass through a mobile device or a computer to the Nielsen data collection



system, the watermark must be packaged into an ID3 metadata container stored in the broadcast content. During the transcoding of the content stream, the PCM-to-ID3 SDK translates the watermark into an ID3v2 tag. A vendor integrates the SDK into their transcoder application code base and then collaborates with the Nielsen Engineering team to validate the SDK integration through the transport stream.

Licensing Agreement Requirements for Validation

Required Items

To perform the tests, you must have the following from Nielsen:

- Nielsen ID3 SDK Validator application (command-line tool): You need this application to decode the transport stream output of your device and send the decoding results to Nielsen for the validation process. If you do not already have the Nielsen ID3 SDK Validator tool, contact your Nielsen Engineering representative to obtain it.
- Test files:
 - VendorCert-NORMAL-v01.ts
 - VendorCert-BOUNDARY-v01.ts
 - VendorCert-STRESS-v01.ts

Required Tasks

As part of the agreement for integrating the Nielsen PCM-to-ID3 SDK, you must do all of the following:

1. Verify that you have the latest versions of the ID3 SDK Validator and PCM-to-ID3 SDK.
 - a. Make a note of the versions you have on your hard drive.
 - b. On the Engineering Client Portal at https://engineeringportal.nielsen.com/docs/ID3_Transcoders, compare your version against the list of versions on the right side of the page.
 - c. If you do not have the latest version, click any of the links and complete the request. Nielsen approves your request and sends you an email with a link to the download page.



Important If you do not see the email within 24 hours, your email application may have sent the email to your Junk or Spam folder so check there. We recommend that you add encodersupport@nielsenengineering.com to the contact list in your email application.

- d. Click the link in the email from Nielsen Engineering.
2. Certify the device before the product can be deployed with the Nielsen ID3 Tag Inserter feature enabled for commercial or production use.
3. Use your device or system to execute the four tests outlined in this document, and send the output of the tests to Nielsen for verification.
4. To ensure you cover all of the audio profiles that your device supports, complete the forms in Appendix A: Inventory of Content Provided to Nielsen on page 13. Attach the form to an email and send it to your Nielsen Engineering representative.

Validation Tests

Important For help with test device configurations, the execution of the validation tests, or questions about ID3 Tag Validator output, contact your Nielsen Engineering representative for assistance. See the *Nielsen ID3 Tag Validator Application User Guide* for information on analysis.

Approach

The approach for these procedures uses the black-box software quality assurance methodology. Our process examines the functionality of your device as it applies to Nielsen ID3 data without understanding the internal code structures or functionality of your device.

You feed to your device known, measurable content that has Nielsen audio watermarks embedded in the broadcast audio. Nielsen provides you with test files that you pass through the Nielsen PCM-toID3 SDK software installed on your device.

Once the Nielsen-supplied content is transcoded and tagged, you capture the transport-stream output and/or the HLS output of your device if doing HLS, and/or the DASH output of your device if doing DASH. You may use the Nielsen ID3 Tag Validator command-line diagnostic tool to decode the output. You send the captured transport stream and/or the zipped HLS content and/or zipped DASH content to Nielsen Engineering, where we compare your results to a set of expected results.

You also feed to your device live broadcast content that has Nielsen audio watermarks embedded in the audio. You may select any live broadcast feed from a national cable network as your content. Once the live content is transcoded and tagged, you capture the transport-stream output and/or the HLS output of your device if doing HLS, and/or the DASH output of your device if doing DASH. You may use the Nielsen ID3 Tag Validator command-line diagnostic tool to decode the transport-stream output. You send the captured transport stream and/or the zipped HLS output and/or the zipped DASH output to Nielsen Engineering.



Scope

- All tests are required, and the results of the tests must be validated before you deploy your device with the Nielsen ID3 Tag Inserter feature enabled.
- Except for your live content testing, tests are limited to the test files developed by Nielsen Engineering, available to you through your Nielsen Engineering representative.
- Except for your live content testing, all test files must include the following three input types. All devices must accept these input types and produce output content that facilitates accurate audience measurement by Nielsen.
 - Normal condition content that represents programming that is correctly Nielsen-watermarked (VendorCert-NORMAL-v01.ts file)
 - Boundary condition content includes pre-existing Nielsen ID3 tags that your software must remove and replace with newly generated tags. (VendorCert-BOUNDARY-v01.ts file)
 - Stress condition content that represents programming that is incorrectly Nielsen-watermarked. The primary audio stream in this content switches periodically from stereo to 5.1-channel to stereo (VendorCert-STRESS-v01.ts file)

Validation Elements

Nielsen analyzes the transport stream and/or HLS output of your device if doing HLS, and/or the DASH output of your device if doing DASH, for the elements listed below. For more information about these elements, refer to the guides listed in the Related Documents section.

- PCM audio channel selection
- AC-3 channel switching
- Decoder fidelity
- ID3 tag cadence, consistency, synchronization, and overwrite
- Nielsen watermarks fidelity within the ID3 tag
- Non-Nielsen-watermarked ID3 tag fidelity within the ID3 tag
- Nielsen live/video-on-demand flag fidelity within the ID3 tag
- Nielsen InfoTag content within the ID3 tag
- HLS / DASH output profiles
- Standard interface capabilities
- Error logging



Content You Send Nielsen

For each test that you run, Nielsen requires that you provide the following for analysis:

- Tagged output
 - For Tests 1, 2, and 3, the tagged output must represent the same content as the original Nielsen test stream. It is acceptable for the content to include a pre-roll, trailing data, or both, but the original Nielsen test content must be complete and contiguous.
 - For Tests 1, 2, 3, and 4, the output must be in all of the following formats that pertain to the capabilities of your system:
 - Captured transport stream
 - Captured HLS output (all m3u8s and segments), zipped
 - Captured DASH output (all manifests and segments), zipped
- Provide screenshots that show the following
 - Your user interface showing the Distributor ID field is configurable.
 - The product name and version, if applicable.

Note

In the Microsoft Windows operating system, open the drop-down menu in your transcoder interface, press <Print Screen>, and paste the screenshot into Paint. In an iOS operating system, open the drop-down menu, press <Cmd + Shift + 4>, which automatically saves the screenshot to a file in your default location. Name the screenshot file to align with its contents.

- Complete instructions on how to access the output and screenshots. See Appendix A: Inventory of Content Provided to Nielsen on page 13.



Validation Test #1: Normal Content

Summary

The purpose of this test is to validate the ability of the device to generate Nielsen ID3 tags during the transcoding of normal condition broadcast content (correctly Nielsen audio watermarked).

Execution Steps

1. On the website at https://engineeringportal.nielsen.com/docs/ID3_Transcoders, download the three test files.
2. Configure your device for this test.
Note Make certain that all configurable fields (specifically, the distributor ID) and non-configurable fields are set correctly. Hard-code the vendor ID, breakout code, productID, and version.
3. Stream the content in **VendorCert-NORMAL-v01.ts** to your device in a way that simulates the method and rate of content delivery when your device is installed in the field.
4. Into a file, capture the transport-stream output of your device after the Nielsen ID3 tags have been multiplexed into the transport stream and prior to HLS or DASH segmentation.
5. Use the Nielsen ID3 Tag Validator application output to analyze the ID3 transport stream. Correct any errors that you find.
6. Do either or both of the following:
 - For HLS, capture the m3u8 files and HLS transport-stream segments from your device and zip these into a file.
 - For DASH, capture the files from your device and zip these into a file.
7. Send the items listed in “Appendix A: Inventory of Content Provided to Nielsen” on page 13 to Nielsen for evaluation and certification.



Validation Test #2

Summary

The purpose of this test is to validate the ability of the device to generate Nielsen ID3 tags during the transcoding of challenged Nielsen audio-watermarked broadcast content.

Execution Steps

1. Configure your device for this test.

Note Make certain that all configurable fields (specifically, the distributor ID) and non-configurable fields are set correctly. Hard-code the vendor ID, breakout code, productID, and version.

2. Stream the supplied Nielsen content in VendorCert-BOUNDARY-v01.ts to your device in a way that simulates the method and rate of content-delivery when your device is installed in the field.
3. Into a file, capture the transport-stream output of your device after the Nielsen ID3 tags have been multiplexed into the transport stream and prior to HLS or DASH segmentation.
4. Use the Nielsen ID3 Tag Validator application output to analyze the ID3 transport stream. Correct any errors that you find. For this test, do not be alarmed if the Validator CID SID test reports "Fail."
5. Do either or both of the following:
 - For HLS, capture the m3u8 files and HLS transport-stream segments from your device and zip these into a file.
 - For DASH, capture the files from your device and zip these into a file.
6. Send the items listed in "Appendix A: Inventory of Content Provided to Nielsen" on page 13 to Nielsen for evaluation and certification.



Validation Test #3

Summary

The purpose of this test is to validate the ability of the device to generate Nielsen ID3 tags during the transcoding of stressed broadcast content (incorrectly Nielsen-watermarked content where the audio switches periodically from stereo to 5.1 to stereo).

Execution Steps

1. Configure your device for this test.

Note Make certain that all configurable fields (specifically, the distributor ID) and non-configurable fields are set correctly. Hard-code the vendor ID, breakout code, productID, and version.

2. Stream the supplied Nielsen content VendorCert-STRESS-v01.ts to the device in a way that simulates the method and rate of content-delivery when your device is installed in the field.
3. Into a file, capture the transport-stream output of your device after the Nielsen ID3 tags have been multiplexed into the transport stream and prior to HLS or DASH segmentation.
4. Use the Nielsen ID3 Tag Validator application output to analyze the ID3 transport stream. Correct any errors that you find. For this test, do not be alarmed if the Watermark Timecode Test reports "Warn."
5. Do either or both of the following:
 - For HLS, capture the m3u8 files and HLS transport-stream segments from your device and zip these into a file.
 - For DASH, capture the files from your device and zip these into a file.
6. Send the items listed in "Appendix A: Inventory of Content Provided to Nielsen" on page 13 to Nielsen for evaluation and certification.



Validation Test #4

Summary

The purpose of this test is to validate the ability of the device to generate Nielsen ID3 tags during the transcoding of live Nielsen Audio Watermarked broadcast content.

Execution Steps

1. Configure your device for the upcoming test.

Note Make certain that all configurable fields (specifically, the distributor ID) and non-configurable fields are set correctly. Hard-code the vendor ID, breakout code, productID, and version.

2. Stream the live broadcast content the device in a way that simulates the method and rate of content-delivery when your device is installed in the field.

Important Note the national broadcast network that was used and the date and time of the live broadcast and include it in the information you send to Nielsen.

3. Allow the device to run in normal operation for a minimum of **120** minutes.
4. Into a file, capture **15** minutes of the transport-stream output of your device after the Nielsen ID3 tags have been multiplexed into the transport stream and prior to HLS segmentation or DASH segmentation.
5. Use the Nielsen ID3 Tag Validator application output to analyze the ID3 transport stream. Correct any errors that you find.
6. Do either or both of the following:
 - For HLS, capture the m3u8 files and HLS transport-stream segments from your device and zip these into a file.
 - For DASH, capture the files from your device and zip these into a file.
7. Send the items listed in “Appendix A: Inventory of Content Provided to Nielsen” on page 13 to Nielsen for evaluation and certification.



Test File	Full Path and File Name	Other Pertinent Configuration Parameters