



EIDR: BEST PRACTICE – ADAPTIVE STREAMING

This document details the best practice for registering EIDR IDs for use with adaptive streaming workflows and a naming convention framework for CDNs.

1 Introduction

Adaptive streaming workflows can be quite complex, involving many thousands of files per offer (when taken down to the delivered segment level) and often a mix of pre-recorded and dynamically generated materials. This becomes even more complex when attempting to implement adaptive streaming across a federated CDN network where multiple content providers, distributors, and CDN operators must agree on a common approach. EIDR can offer a small measure of comfort in this troubled world by establishing clear practices for how these various assets are registered for EIDR IDs and recommending how the EIDR ID can be included in CDN file names.

For ease of communication, EIDR has adopted the following terms for use with adaptive streaming:

- **Presentation:** The collection of Adaptation Sets that represent a complete offer.
- **Adaptation Set:** A collection of video, audio, or timed text Representations included as part of an offer.
- **Representation:** A digital file that contains a complete video, audio, or timed text stream, generally at a specific bitstream bandwidth.
- **Segment:** A contiguous subdivision of a Representation; the smallest unit of delivery to the viewer in adaptive streaming delivery.

2 EIDR Registration Practices

2.1 Process Overview

All of the individual assets associated with an adaptive streaming workflow above the segment level¹ can be registered with EIDR to receive unique EIDR IDs. The assets do not have to be assigned EIDR IDs, but if they are, then they shall be registered according to the following best practices:

1. Following established EIDR registration practices:
 - Register the represented work in the abstract. (For a motion picture, this would be an EIDR root Movie record.)
 - Register the appropriate version of the work. (This would be an EIDR Edit record descended from the Abstraction.)
 - Optionally register an EIDR Manifestation as a child of the Edit for the mezzanine file from which all of the adaptive streaming Representations are derived.
 - Set the Manifestation Class to “Mezzanine”.²
 - Optionally, for each adaptive streaming manifestation, register an EIDR Manifestation as a child of the mezzanine Manifestation (if one was registered) or as a child of the Edit (if a mezzanine was not registered.)
2. For adaptive streaming assets in particular:
 - Set the Manifestation Class for all registered Representations to “Representation”.
 - Register an EIDR Manifestation for the adaptive streaming Adaptation Set with the Manifestation Class set to “Adaptation Set”.
 - Include the EIDR Manifestation(s) of the associated adaptive streaming Representations that comprise the Adaptation Set as ExternalTrackReference tags containing the EIDR ID of each Representation’s Manifestation record.³
 - Register an EIDR Manifestation for the adaptive streaming Presentation with the Manifestation Class set to “Presentation”.

¹ It would be unwieldy to attempt to register EIDR IDs for all the segments associated with an adaptive streaming offer. Instead, providers will need to develop alternative identification mechanisms, likely following the EIDR+ format (starting with an EIDR Manifestation ID and adding a unique suffix that identifies the segment within the scope of the identified asset).

² /FullMetadata/ExtraObjectMetadata/ManifestationInfo/ManifestationClass

³ /FullMetadata/ExtraObjectMetadata/ManifestationInfo/Digital/Container/md:Track/
md:ExternalTrackReference

- Include the EIDR Manifestation(s) of the associated adaptive streaming Adaptation Sets that comprise the Presentation as ExternalTrackReference tags containing the EIDR ID of each Adaptation Set's Manifestation record.

NOTE: Ephemeral objects (those generated on demand without expectation of being stored for an appreciable time) will not generally be assigned an EIDR ID.

3 Using an EIDR Content ID in a CDN Filename

Content providers and CDN operators may find it helpful to identify directories and files using related EIDR IDs. Adhering to the following practices will help promote common understanding and interoperability.

NOTE: Each domain must define how EIDR IDs relate to their directory or file contents: do they contain the content identified by the EIDR IDs (as might be the case for an MPEG file) or are they only related to the identified content (as is the case for an MPD file).

When constructing a directory or file name containing an EIDR ID:

- Use the “EIDR-F-” prefix in place of the DOI prefix “10-5240/”. Thus, the EIDR Content ID 10.5240/4DDA-FDF2-9A63-367C-9D6C-S would be represented by the string EIDR-F-4DDA-FDF2-9A63-367C-9D6C-S, avoiding use of the slash (“/”) that is part of a standard DOI prefix.
- Begin the directory or file name with an EIDR-F representation of an associated EIDR Content ID.⁴ e.g.: EIDR-F-4DDA-FDF2-9A63-367C-9D6C-S
 - This will ensure that all CDN directories and files associated with a particular EIDR ID will sort together in a directory listing.
- The EIDR-F representation shall be followed by an underscore (“_”), period (“.”), or nothing.
 - To ensure file name uniqueness and further facilitate discover by inspection, the underscore shall introduce a metadata string whose format and values are defined within the subject domain. e.g.: EIDR-F-4DDA-FDF2-9A63-367C-9D6C-S_metadata
 - A period shall be used to introduce a file extension, if any. e.g.: EIDR-F-4DDA-FDF2-9A63-367C-9D6C-S.mp4
 - These may be combined. e.g.: EIDR-F-4DDA-FDF2-9A63-367C-9D6C-S_metadata.ext.
- Since underscore and period do not appear within the EIDR-F representation of an EIDR ID, the additional metadata or file extension can be parsed from the directory or file name using simple text-manipulation.

⁴ As noted above, the exact nature of the association between the EIDR ID and the directory or filename is domain specific.

- In the future, directory or file names may use EIDR ID representations other than EIDR-F, which may mean that the EIDR ID representation is not always 33 characters long. Since it may vary in length, unique character separators are necessary to clearly delineate the end of the EIDR ID and the start of any metadata or file extension.

NOTE: If, in the future, an EIDR-based federated CDN file naming convention is developed, EIDR will help promulgate that standard.