

ASC Framing Decision List (ASC FDL)

Advanced Data Management Subcommittee
THE AMERICAN SOCIETY OF CINEMATOGRAPHERS

Specification v1.1

January 23, 2024

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0. Change Log

February 21, 2023 - v1.0 Specification released

January 23, 2024

1. JSONPath addresses added into section headers: 7.1, 7.2, 7.3, 7.4, 7.5 & 7.6 for easier understanding of where each attribute is placed within an FDL.
2. **Section 7.2.4 *Framing Intent Protection*** has been reworded, to have the framing intent protection scale inward from the Canvas, vs outward from a Framing Decision. This also matches the reference files previously provided.
3. Version updated to {"major": 1, "minor": 1} in JSON sample data.

1. Introduction

ASC FDLs are a set of instructions for how to view media in any application. The ASC FDL provides a mechanism to document framing decisions through all phases of a project's life cycle, from pre-visualization through post-production. The FDL can exist in the form of a sidecar JSON file, or embedded into another data structure like camera original files. Any time an application is rendering media to go to another department or person, an accompanying set of ASC FDL data should be created to inform how to view the newly generated content. This ASC FDL data can be applied to view the intended framing.

2. Scope

This document specifies format definitions and operations for the ASC Framing Decision List (ASC FDL), for the exchange and creation of framing data. This document also contains the information required to implement an "ASC FDL-compliant" software/hardware system.

The ASC FDL is intended for use in media production workflows and has been optimized to support the ability for a department or person to be able to easily recreate framing made by others, while limiting human error and the traditional operational burden. A common example is when on-set framing decisions have been made by an Image Author that then need to be conveyed to the vendor processing material for editing and review. Often, the processes used for re-creating that on-set framing decision are manual and prone to human error.

While ASC FDL is able to track framing decisions per shot, tracking per frame is currently out of scope.

3. Conformance Notation

Normative text is text that describes elements of the design that are indispensable or contains the conformance language keywords: "shall", "should", or "may". Informative text is text that is potentially helpful to the user, but not indispensable, and can be removed, changed, or added editorially without affecting interoperability. Informative text does not contain any conformance keywords.

All text in this document is, by default, normative, except: the Introduction, any section explicitly labeled as "Informative" or individual paragraphs that start with "Note:"

The keywords "shall" and "shall not" indicate requirements strictly to be followed in order to conform to the document and from which no deviation is permitted.

The keywords, "should" and "should not" indicate that, among several possibilities, one is recommended as particularly suitable, without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required; or that (in the negative form) a certain possibility or course of action is deprecated but not prohibited.

The keywords "may" and "need not" indicate courses of action permissible within the limits of the document. The keyword “reserved” indicates a provision that is not defined at this time, shall not be used, and may be defined in the future. The keyword “forbidden” indicates “reserved” and in addition indicates that the provision will never be defined in the future.

The following font/font color formatting is used throughout this document:

- JSON formatting has been used to show examples of ASC FDL code
- Purple is used for JSON elements, attributes and values, e.g. `aspect_ratio`

4. References

- JavaScript Object Notation ([JSON](#))
- Unicode Transformation Format 8-bit ([UTF-8](#))

5. Concepts and Semantics

5.1 ASC FDL

An ASC FDL is a self-contained file with an .fdl extension. The file is formatted utilizing [JSON](#) and does not require a specific directory structure. FDL data can also be written into camera files, or shared within other file types that support it.

5.2 Locating ASC FDL Files

Requiring specific folder structures, file names or how an application may locate an FDL is not in scope for this specification. It is by design that FDL files can be managed in any directory structure a user may wish, along with any filename the user wishes. It is up to each implementation how they would like the user to select any FDL to be used on any shot.

5.3 Applying ASC FDL Files

ASC FDLs are not intended to be a set of render instructions, but rather instructions for how to view media within an application. It is recommended that any time an application is applying an ASC FDL to media, the [Canvas dimensions](#) should be compared against the resolution of the source material. If these do not match, the user should be warned that they are trying to apply an FDL that does not match the [Canvas dimensions](#) resolution.

6. ASC FDL File Properties

6.1 Schema

An ASC FDL Manifest File is a [JSON](#) document.

6.2 Character Encoding

ASC FDL Manifests shall be encoded using [UTF-8](#) character encoding.

7. Classes

Description:

ASC FDL files are organized in various sections, each containing its own set of attributes. The ASC FDL classes consist of: [Header](#), [Framing Intent](#), [Context](#), [Canvas](#), [Framing Decision](#), [Canvas Template](#).

7.1 Header

JSONPath: \$.

```
"uuid": "BCD142EB-3BAA-4EA8-ADD8-A46AE8DC4D97",  
"version": {"major": 1, "minor": 1},  
"fdl_creator": "ASC FDL Committee",  
"default_framing_intent": "FDLSMP01",
```

7.1.1 UUID

Description:

The UUID field is a globally unique string that differentiates an individual ASC FDL file from any other. The format of the uuid must use the canonical textual representation. The 16 octets of a uuid are represented as 32 hexadecimal (base-16) digits, displayed in 5 groups separated by hyphens, in the form 8-4-4-4-12 for a total of 36 characters (32 alphanumeric characters and 4 hyphens). As an example:

afe122be-59d3-4360-ad69-33c10108fa7a

The [uuid](#) attribute is one of two fields used to determine which FDL should be applied to which shot: `asc_fdl>uuid` and `framing_decision>id`.

The ASC FDL [uuid](#) attribute will utilize the ISO/IEC 9834-8:2008 specification, enabling applications to produce 128-bit identifiers that are either guaranteed to be globally unique, or are globally unique with a high probability. For more information please see: [ISO/IEC 9834-8:2008](#)

As an example:

```
"uuid": "BCD142EB-3BAA-4EA8-ADD8-A46AE8DC4D97",
```

Required Field: Yes

Data Type: string

7.1.2 Version

Description:

The ASC FDL specification may be updated over a course of time and each updated version officially released will have a version number. All ASC FDL files should contain the implementer's ASC FDL version within the header of the ASC FDL file.

As an example:

```
"version": {"major": 1, "minor": 1},
```

Data Type: "major": integer, "minor": integer

Required Field: Yes

7.1.3 FDL Creator

Description:

This field can take a string indicating who created the FDL document. A user or implementation may choose to include the user or the software name/version that was used to create it. If any software receives an FDL and adds data to it, the **fdl_creator** field should represent the most recent modifying author when creating a new version of the FDL.

As an example:

```
"fdl_creator": "ASC FDL Committee",
```

Data Type: string

Required Field: No

Default Value: Omitted

7.1.4 default_framing_intent:

Description:

Having a specific **framing intent** flagged as default will allow implementations to know which one to automatically use, when multiple framing intents exist within a single FDL.

The **default_framing_intent** contains the **Framing Intent id** of the primary **Framing Intent**.

As an example:

```
"default_framing_intent": "FDLSMP01",
```

Data Type: string

Required Field: No

7.2 Framing Intents

JSONPath: \$.framing_intents

```
"framing_intents": [{  
  "label": "2.39-1 Framing",  
  "id": "FDLSMP01",  
  "aspect_ratio": {"width": 239, "height": 100},  
  "protection": 0.05  
}]
```

Description:

Creating a **Framing Intent** is the first key step to creating an FDL. It represents the intended aspect ratio, unbounded by the constraints of any camera or device. This is the region within which a cinematographer will compose content intended for the viewing audience. An FDL may contain multiple **Framing Intents**.

Child Elements:

7.2.1 label:

The label field in an FDL is a field to provide a human readable title for a Framing Intent.

Note: Using UTF-8 strings with non-ASCII characters may have compatibility issues on some software.

Note: An implementation may choose to show this field in their interface for allowing a user to choose which framing intent from the selected FDL they would like to apply.

As an example:

```
"label": "2.39-1 Framing",
```

Data Type: string

Required Field: No

7.2.2 id:

The **Framing Intent id** field is meant to provide a means of identification for a **Framing Intent**. This **id** is not universally unique, but no other **Framing Intent id** within a single FDL will use the same **id**. The **Framing Intent id** field shall be between 1-32 characters in length and be limited to the use of alphanumeric characters and underscores.

As an example:

```
"id": "FDLSMP01",
```

Data Type: string

Required Field: Yes

7.2.3 aspect_ratio:

The **aspect_ratio** field represents the image author's original intention. An **aspect_ratio** shall utilize width and height integers to provide an exact ratio for higher accuracy, non-integers (e.g. 1.78) are not allowed.

As an example:

```
"aspect_ratio": {"width": 239, "height": 100},
```

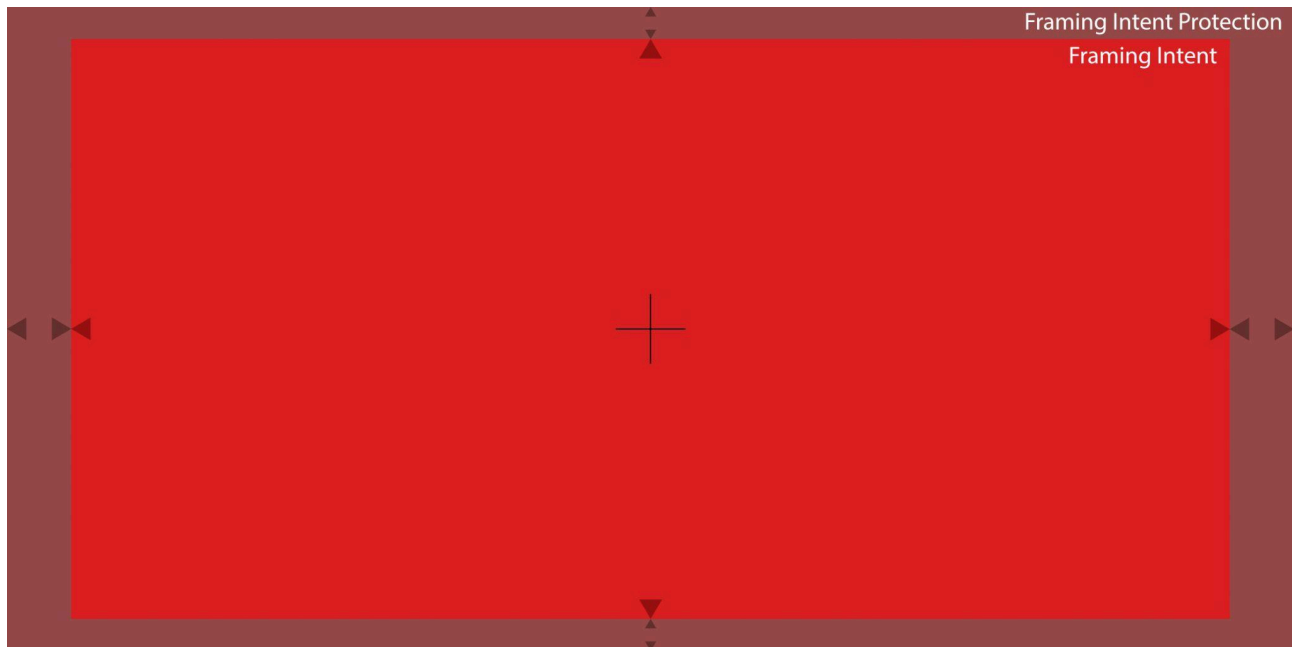
Data Type: "width": integer, "height": integer

Required Field: Yes

7.2.4 protection:

A **framing intent** may include a defined area for protection. This area is called **Framing Intent Protection** and matches the aspect ratio of the **Framing Intent**.

A protection value of 0 means there will be no Framing Intent Protection. A Framing Intent Protection value of 0.05 results in a 5% Framing Decision Protection area calculated inward from the edge of the defined Canvas dimensions: $1.00 - 0.05 = 0.95$ or 95%.



As an example:

"protection": 0.05

Data Type: float (greater than or equal to 0)

Required Field: No

Default Value: 0

7.3 Contexts

JSONPath: \$.contexts

```
"contexts": [{  
  "label": "ArriLF OG",  
  "context_creator": "ASC FDL Committee",  
}]
```

Description:

The **Context** class provides the ability for image authors to provide additional information on the origin of the ASC FDL. The field's purpose is for users to manage and organize their FDL data. As an example, an image author may choose to have framing data specific to a certain camera, editorial delivery, visual effects plates, etc, all separated by **Contexts**. Another production may choose to use the **Context** field to separate each camera manufacturer.

Child Elements:

7.3.1 **label**:

The **label** field is a user defined field available to categorize/manage FDL data. As an example: "ArriLF OG".

Note: Using UTF-8 strings with non-ASCII characters may have compatibility issues on some software.

As an example:

```
"label": "ArriLF OG",
```

Data Type: string

Required Field: No

7.3.2 **context_creator**:

The **context_creator** attribute will be populated by the application that has generated the FDL. This field represents which user or implementation has generated this specific context within the ASC FDL. There could be different **context_creator** data in each context if multiple authors contributed to an ASC FDL. It is up to the implementation as to how it formats this attribute's values.

As an example:

```
"context_creator": "ASC FDL Committee",
```

Data Type: string

Required Field: No

7.4 Canvases

JSONPath: \$.contexts[:].canvases

```
"canvases": [{
  "label": "Open Gate RAW",
  "id": "20220310",
  "source_canvas_id": "34256345",
  "dimensions": {"width": 4448, "height": 3096},
  "effective_dimensions": {"width": 4006, "height": 2788},
  "effective_anchor_point": {"x": 222, "y": 155},
  "photosite_dimensions": {"width": 4448, "height": 3096},
  "physical_dimensions": {"width": 36.7, "height": 25.54},
  "anamorphic_squeeze": 1.00,
```

Description:

The **Canvas** defines the active coordinate system of an application, file, or video stream. An application, file, or video stream could contain additional area outside of the defined **Canvas**, but applying an FDL to utilize that region would require a different **Canvas**. As an example, if a camera recorded a file, the file's recorded resolution will be utilized as the **Canvas**. If you then record a second file in a different resolution, you will have a new canvas. A **Canvas** can only be generated once the system creating it understands what the recorded/generated area is going to be.

Child Elements:

7.4.1 label:

The **label** field is a user defined field available to categorize/manage FDL **Canvases**. As an example: "Open gate RAW".

Note: Using UTF-8 strings with non-ASCII characters may have compatibility issues on some software.

As an example:

```
"label": "Open Gate RAW",
```

Data Type: string

Required Field: No

7.4.2 id:

The **Canvas id** field is meant to provide a means of identification for a **Canvas**. The **id** is unique to each **Canvas** inside of a given FDL, but may not be globally unique to other FDL files. The **Canvas id**

field shall be between 1-32 characters in length and will allow for use of alphanumeric characters and underscores.

As an example:

```
"id": "20220310",
```

Data Type: string

Required Field: Yes

7.4.3 source_canvas_id:

ASC FDLs may be generated from original camera files, or derivatives from the original camera files. Therefore the **source_canvas_id** attribute has been created to allow a user to see the **Canvas** that was used when the original ASC FDL was created. As an example, a user may have an ASC FDL for the source camera file. They may then render plates to be delivered to a VFX vendor with a smaller resolution. Along with these plates, a new FDL may be delivered. The new ASC FDL's **Canvas id** will represent the new **Canvas** (VFX plates) that were generated. However the **source_canvas_id** would reference the initial **Canvas** id the new **Canvas** was generated from.

Any time an application creates a new FDL with a new **Canvas**, or appends an FDL with a new **Canvas**, it is expected that the original source **Canvas** be maintained. Therefore when a new FDL is created, both the new **Canvas** and the source **Canvas** should be present within the file.

If there is no prior knowledge of a past generation **canvas**, the **source_canvas_id** should be the same value as **Canvas id**.

As an example:

```
"source_canvas_id": "34256345",
```

Data Type: string

Required Field: Yes

7.4.4 dimensions:

Any **canvas** within an ASC FDL will have a width and height defined. The **dimensions** field will be formatted as: "width": 4448, "height": 3096

As an example:

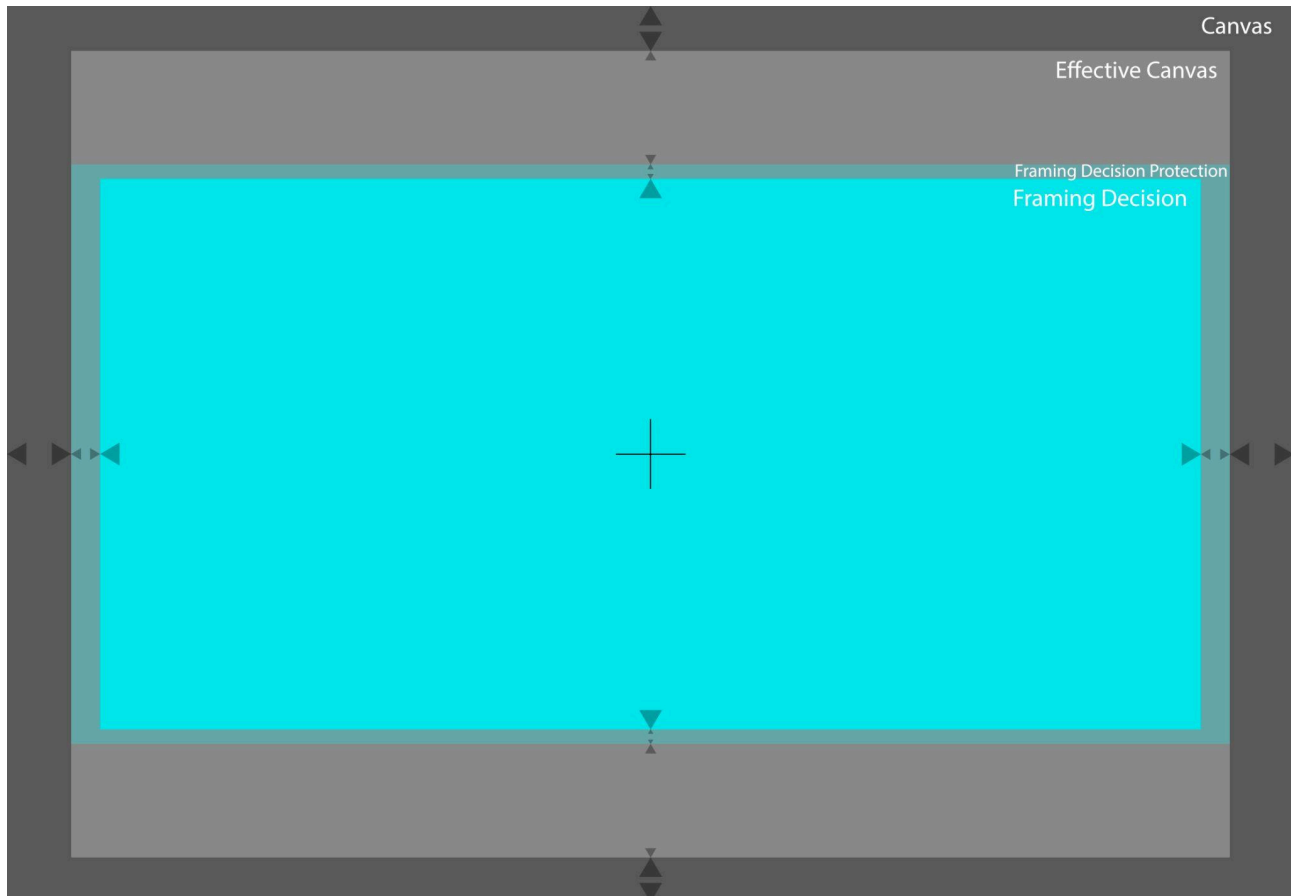
```
"dimensions": {"width": 4448, "height": 3096},
```

Data Type: "width": integer, "height": integer

Required Field: Yes

7.4.5 **effective_dimensions:**

A **Canvas** can be effectively constrained to prevent a **Framing Intent** and its **Framing Intent Protection** from being applied outside an intended area. This is called an **Effective Canvas**. As an example, when vignetting results from a lens that doesn't cover your camera's sensor, a user may choose to constrain the usable **Canvas** to the region not affected by vignetting. When the user applies the **Framing Decision** within, it will not have the vignetting in frame.



The **effective_dimensions** will define the width and height of this canvas constraint and will be written as:

"width": 4006, "height": 2788

As an example:

"effective_dimensions": {"width": 4006, "height": 2788},

Data Type: "width": integer, "height": integer

Units: Pixels

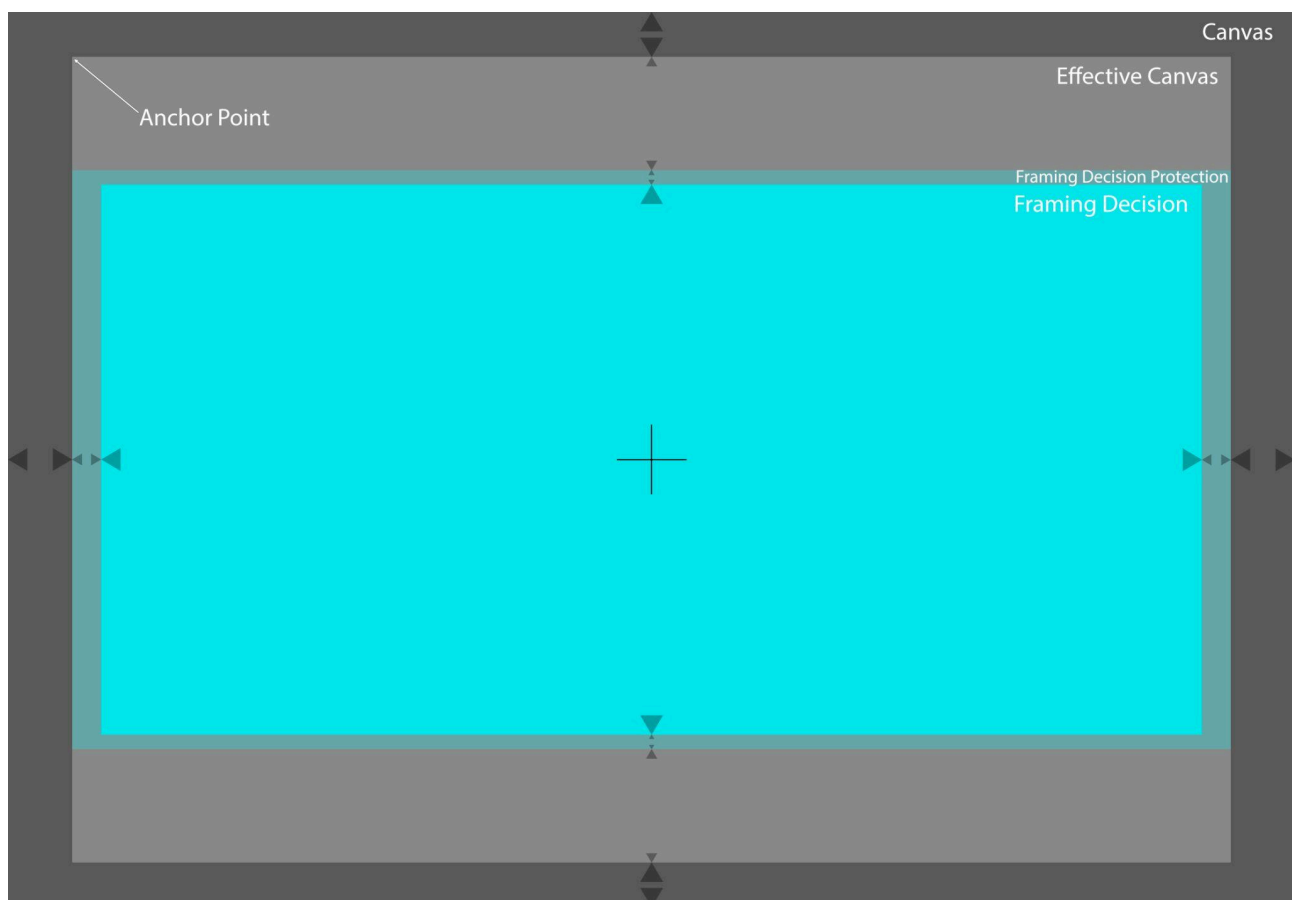
Required Field: No

7.4.6 **effective_anchor_point:**

If an **Effective Canvas** is to be placed within a **Canvas**, any implementation will require an understanding of the area to be used and where to position this area within the **Canvas**. The **effective_anchor_point** documents where the top left pixel of the **Effective Canvas** should be inside the **Canvas**. Similarly to the **Framing Decision anchor_point**, we're using float versus int values for these variables to avoid rounding issues when scaling.

The **effective anchor point** will be written as an example

"x": 222, "y": 155.1



As an example:

```
"effective_anchor_point": {"x": 222, "y": 155},
```

Data Type: "x": float, "y": float

Required Field: Yes if there is an **effective_dimensions**, otherwise No

Units: Pixels

7.4.7 **photosite_dimensions:**

We encourage camera manufacturers to provide this data when a camera has generated an ASC FDL **Canvas**. We do not require any implementation to generate photosite dimensions for non physical camera generated canvases. As an example, if a camera generated a **Canvas** it would ideally capture this attribute. However if an ASC FDL was generated with a new **Canvas** for a VFX Plate, this attribute would not be expected to be filled. Therefore, a source **Canvas** should have **photosite_dimensions**, but a subsequent child **Canvas** would likely not.

As an example;

Arri Alexa Mini - Recording Mode: 4K UHD

Sensor Active Image Area:

3200 x 1800 photosites

Recording File Image Content:

3840 x 2160 pixels

As an example:

```
"photosite_dimensions": {"width": 4448, "height": 3096},
```

Data Type: "width": integer, "height": integer

Required Field: No

Units: Photosites

Default Value: Omitted

7.4.8 **physical_dimensions:**

We encourage camera manufacturers to provide this data when a camera has generated an ASC FDL **Canvas**. We do not require any implementation to generate **physical_dimensions** for non physical camera generated canvases. As an example, if a camera generated a **Canvas** it would ideally capture this attribute. However if an ASC FDL was generated with a new **Canvas** for a VFX Plate, this attribute is not mandatory. Any implementation that is reading an FDL that originally contained **physical_dimensions**, could now generate new **physical_dimension** values.

Note: To ensure accuracy to one tenth of a micron users should provide 4 decimal places.

As an example:

```
"physical_dimensions": {"width": 36.7, "height": 25.54},
```

Data Type: "width": float, "height": float

Required Field: No

Unit Type: Millimeters

Default Value: Omitted

7.4.9 anamorphic_squeeze:

Any application reading an FDL will need to understand if the **Canvas** it is reading is squeezed or not. The **anamorphic_squeeze** attribute will match the image deformation numbering system that lens manufacturers use. As an example, 1.3 would mean the image is currently squeezed by a ratio of 1.3:1. Or 2.0 would indicate the image has been squeezed by a factor of 2:1. The squeeze is specifically a horizontal squeeze factor.

All applications reading an ASC FDL will apply the squeeze factor before any scaling, to ensure consistency between applications. This will be critical considering if you apply these in a different order you may get different results and we want to ensure consistency between any implementation.

Note: Users must ensure they provide enough decimal places. e.g. some lenses are 1.3 and some are 1.33, these are different values.

As an example:

"anamorphic_squeeze": 1.00,

Data Type: float (greater than 0)

Required Field: No

Default Value: 1

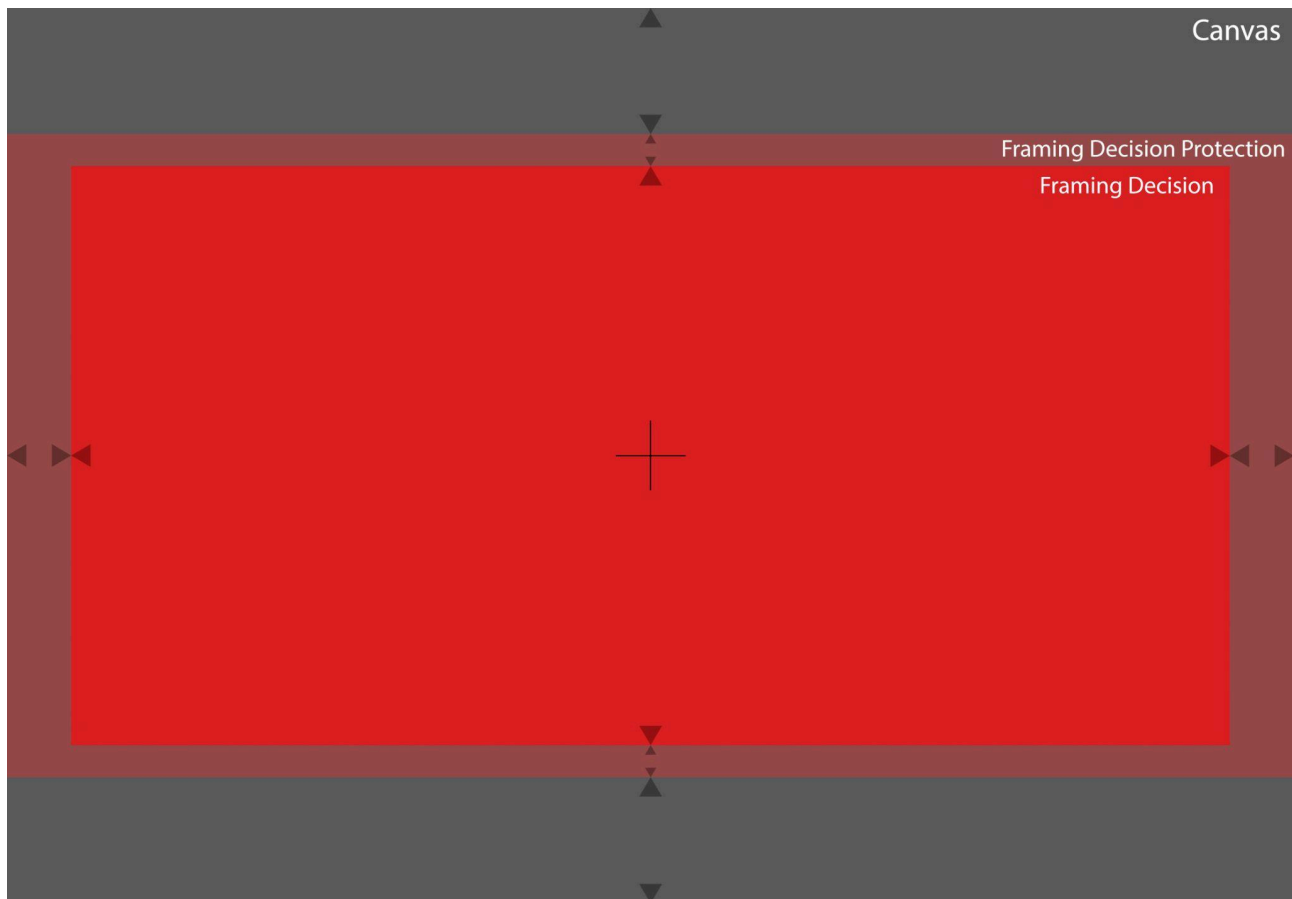
7.5 Framing Decisions

JSONPath: \$.contexts[:].canvases[:].framing_decisions

```
"framing_decisions": [{
  "label": "2.39-1 Framing",
  "id": "20220310-FDLSMP01",
  "framing_intent_id": "FDLSMP01",
  "dimensions": {"width": 4004.1, "height": 2002},
  "anchor_point": {"x": 222.00, "y": 547.00},
  "protection_dimensions": {"width": 4448, "height": 2224},
  "protection_anchor_point": {"x": 0, "y": 436}
```

Description:

When the initial **Framing Intent** was created, it did not have any attributes that documented its position within a **Canvas**, nor anything that defined its actual size. It was just a defined aspect ratio. When a **Framing Intent** and its **Framing Intent Protection** are now applied to a **Canvas**, two decisions are produced: a **Framing Decision** and a **Framing Decision Protection**. The **Framing Decision** which is connected to a specific **Canvas** will have a defined set of coordinates, so any application reading an ASC FDL can understand where the intended frame resides.



Child Elements:

7.5.1 **label:**

The **Framing Decision label** is a user defined field available to categorize/manage FDL data. As an example: "2.39:1 Framing".

Note: Using UTF-8 strings with non-ASCII characters may have compatibility issues on some software.

As an example:

```
"label": "2.39-1 Framing",
```

Data Type: string

Required Field: No

7.5.2 id:

Each **Framing Decision** will have its own **id** field that will be unique to the ASC FDL, but not universally unique among other ASC FDLs.

The formatting of the framing decision id will be:

[canvas>id] [-] [framing_intent>id]

As an example:

```
"id": "20220310-FDLSMP01",
```

Data Type: string

Required Field: Yes

7.5.3 framing_intent_id:

Including the **framing_intent_id** inside the **framing_decision** class is intended to allow for any implementation to infer which **framing_intent** this **framing_decision** is connected to.

As an example:

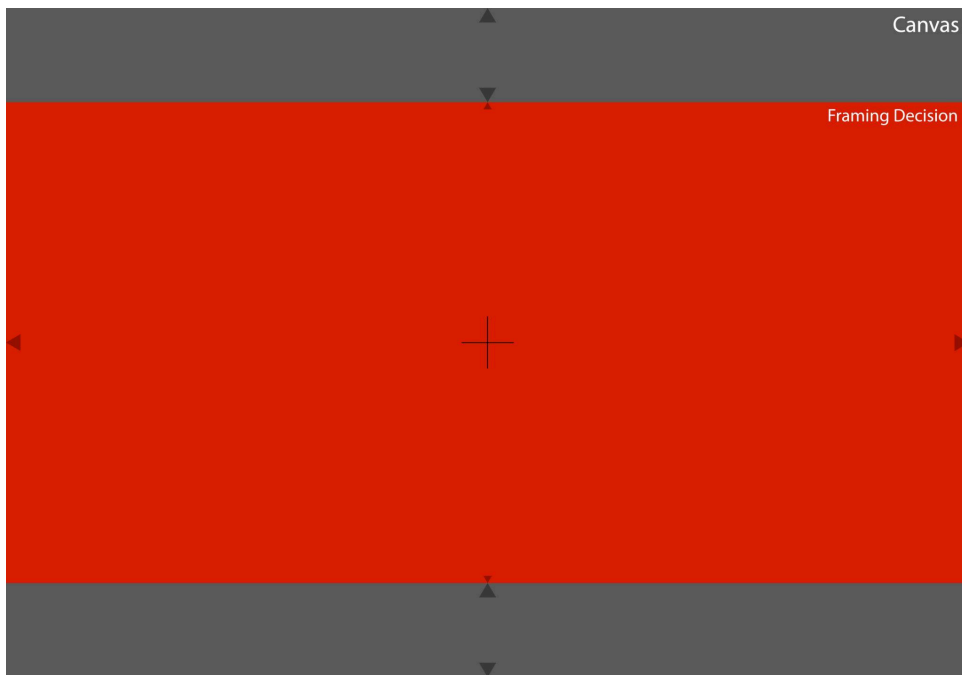
```
"framing_intent_id": "FDLSMP01",
```

Data Type: string

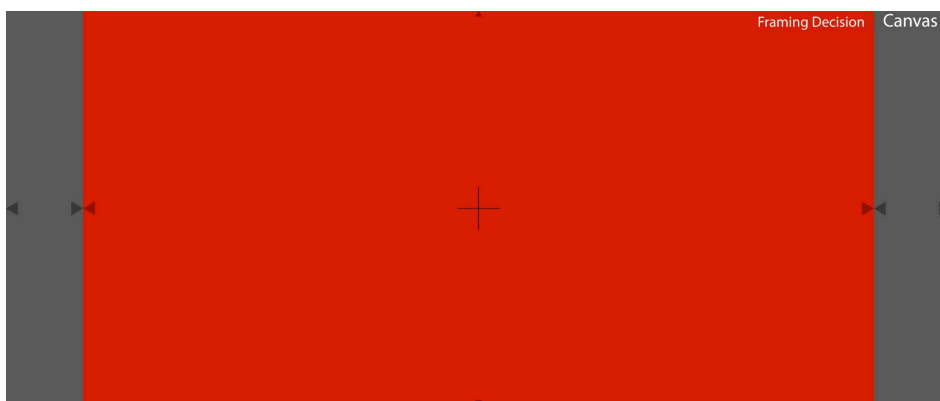
Required Field: Yes

7.5.4 dimensions:

The **Framing Decision dimensions** will specify the width and height of the **Framing Decision** now that it has been placed within a **Canvas**. When generating an ASC FDL, any implementation shall by default place the framing decision to fit within the **Canvas**, not cropping any of the resulting **Framing Decision**. As an example, if the **Canvas** had an aspect ratio of 1.43, and the **Framing Intent** was 2.0, the resulting **Framing Decision** would letterbox the **Canvas**:



Alternatively, if the **Canvas** had an aspect ratio of 2.39, it would be pillarboxed:



The dimensions shall be formatted as float number values, for higher scaling precision. When the float values need to become integers for display purposes in any implementation, we recommend the nearest integer value.

When a **Canvas** has been scaled to a new dimension, it is possible that the **Framing Decision dimensions** will not match the **Framing Intent** perfectly. When this new FDL is read by any implementation, the **Framing Decision dimensions** should take precedence.

As an example:

```
"dimensions": {"width": 4004.1, "height": 2002},
```

Data Type: "width": float, "height": float

Required Field: Yes

7.5.5 **anchor_point:**

If an application is given a **dimension** for the **Framing Decision** in pixels, it still needs to understand where to position this within the **Canvas**. The **Framing Decision anchor_point** specifies where the top left pixel of the **Framing Decision** is, in relation to the top left of the **Canvas**, or the **Effective Canvas** if one was used.

The **anchor_point** uses float versus int values to avoid scaling ambiguities and rounding issues when scaling.

As an example: "x": 222.00, "y": 547.00

The first value is the number of pixels horizontally from the left side of the **Canvas**, unless an **Effective Canvas** has been used. If an **Effective Canvas** has been used, the **anchor_point** would count from the left side of the **Effective Canvas**.

The second value uses the same process, but now for the y-axis.

As an example:

```
"anchor_point": {"x": 222.00, "y": 547.00},
```

Data Type: "x": float, "y": float

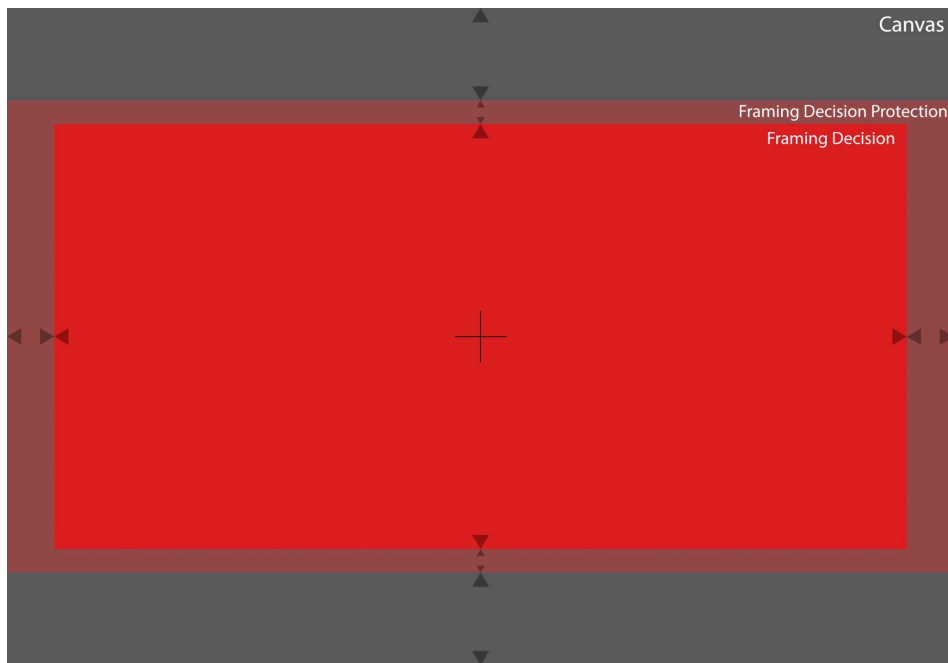
Required Field: Yes

Units: Pixels

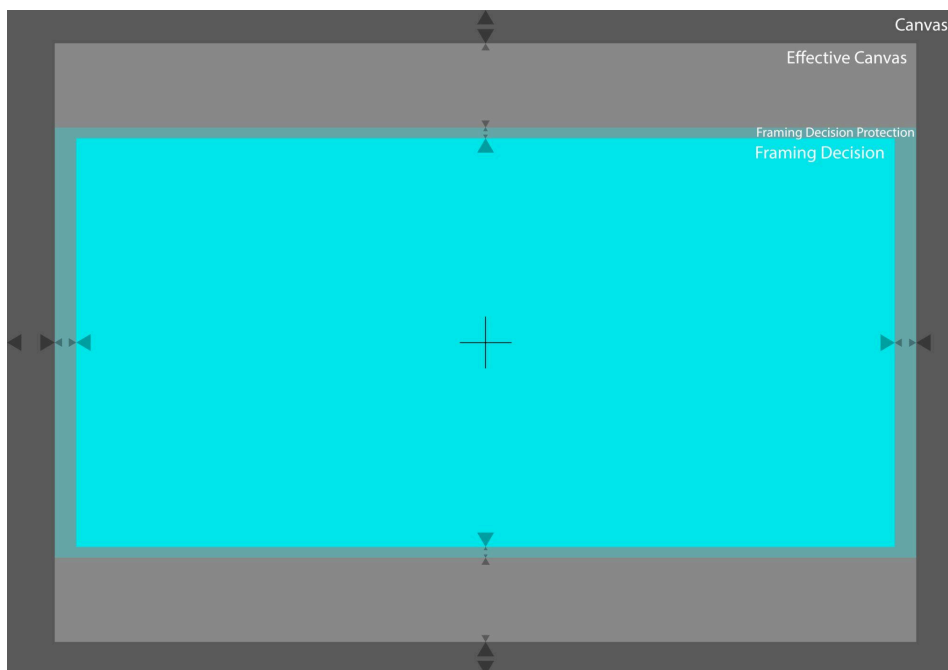
7.5.6 **protection_dimensions:**

Similarly to the **Framing Intent** resulting in a **Framing Decision** once placed within a **Canvas**, the **Framing Intent Protection** will result in a **Framing Decision Protection** once placed within a **Canvas**. This area may be utilized as a safety in post production to allow for slight reframing, stabilization and more.

If a **Framing Decision** had a **protection**, the **protection** would be fit into the **Canvas**:



If an **Effective Canvas** exists, the **Framing Decision** protection would be placed within it:



In the event that a user has chosen a **Framing Decision dimensions** that conflicts with an existing **Framing Intent protection**, it is permissible to override the **Framing Intent protection** to utilize the **Framing Decision dimensions**.

The **Framing Decision protection_dimensions** allows float number values for higher scaling precision.

The framing **Framing Decision protection_dimensions** can be omitted in the case where no protection is being added to the **Framing Decision**.

The formatting of this data will be: "width": float, "height": float

Note: When the float values need to become integers for display purposes in any implementation, we recommend the nearest integer value.

As an example:

```
"protection_dimensions": {"width": 4448, "height": 2224},
```

Data Type: "width": float, "height": float

Unit Type: Pixels

Required Field: Optional

7.5.7 protection_anchor_point:

If a **protection_dimensions** is utilized, any implementation will require an understanding of the area within the **Canvas** to be used. Even if an application is given a **dimensions** in pixels for this area, it still needs to understand where to position it within the **Canvas**. Therefore the **Framing Decision protection_anchor_point** specifies where the top left pixel of the **Framing Decision Protection** is, in relation to the top left of the **Canvas**, or **Effective Canvas** if one was used.

The **Framing Decision protection_anchor_point** will use pixels as the unit type.

The **protection_anchor_point** originates from the top left of the **Canvas**.

The first value is the number of pixels horizontally from the left of the **Canvas dimensions** (or **Effective Canvas dimensions** if one was used) to the edge of the **Framing Decision protection_dimensions** (x-axis).

The second value is the number of pixels vertically from the top of the **Canvas dimensions** (or **Effective Canvas dimensions** if one was used) to the top of the **Framing Decision protection_dimensions** (y-axis).

The framing **Framing Decision protection_anchor_point** can be omitted in the case where no protection is being added to the **Framing Decision**.

As an example:

```
"protection_anchor_point": {"x": 0, "y": 436}
```

Data Type: "x": float, "y": float

Required Field: Optional

Unit Type: Pixels

7.6 Canvas Template

JSON Path: \$.canvas_templates

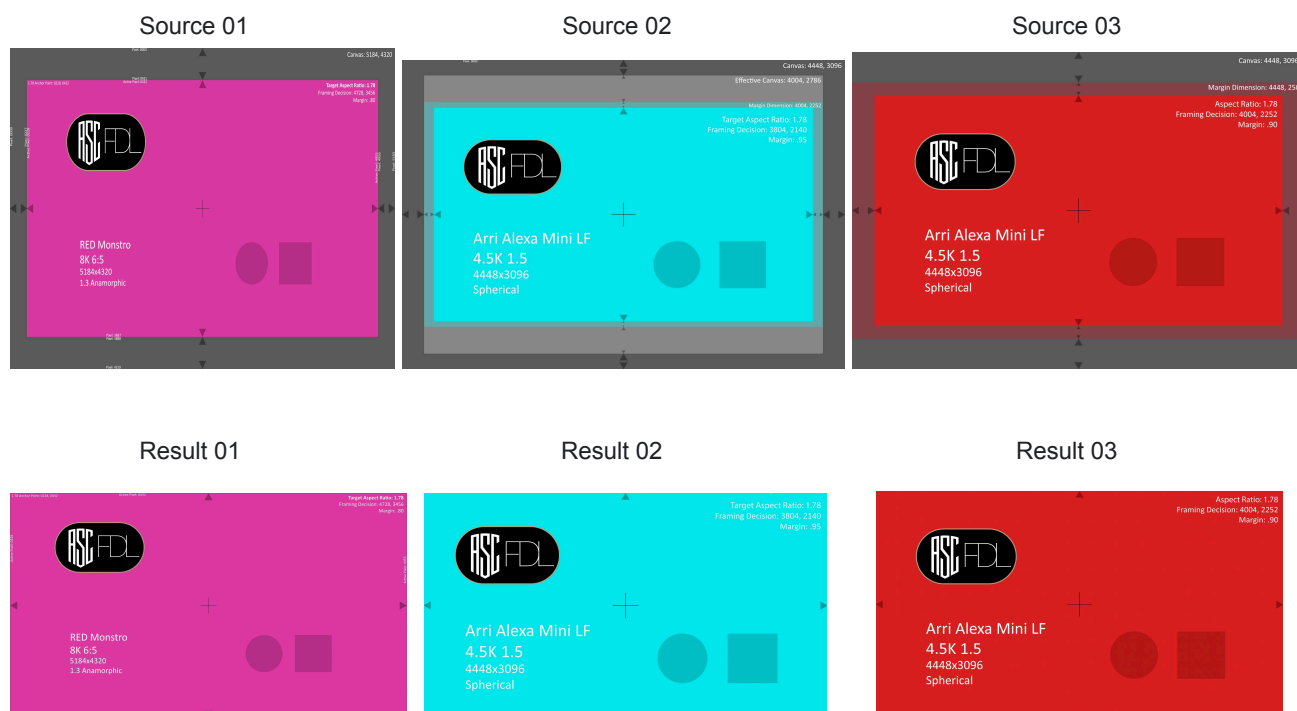
```
"canvas_templates": [{  
  "label": "VFX Pull",  
  "id": "VX220310",  
  "target_dimensions": {"width": 3840, "height": 2160},  
  "target_anamorphic_squeeze": 1.00,  
  "fit_source": "framing_decision.dimensions",  
  "fit_method": "width",  
  "alignment_method_vertical": "center",  
  "alignment_method_horizontal": "center",  
  "preserve_from_source_canvas": "canvas.dimensions",  
  "round": {"even": "even", "mode": "up"},  
  "maximum_dimensions": {"width": 5000, "height": 3496},  
  "pad_to_maximum": "true",  
  "round": {"even": "whole", "mode": "up"}  
}]
```

Description:

The **Canvas Template** is a class within an ASC FDL that provides the ability for users to normalize framing across all camera formats that may have been used during a production.

The **Canvas Template** provides a set of framing instructions that map a **Canvas** into a newly defined **Canvas**. As an example, if various cameras and resolutions were captured during a production, the VFX Supervisor or Picture Finishing Facility may want to ensure that all plates generated for VFX work are normalized into a common container before going to vendors. However they do not know all of the various camera formats that have been captured on set. The user could create a **Canvas Template** within an ASC FDL and provide instructions for any application to place the sources into this newly defined **Canvas**.

As an example:



Note: An ASC FDL file does not require a **Canvas Template**. Many workflows may never utilize this enhanced feature. However this functionality has been added to the specification for sophisticated jobs looking to normalize framing.

An ASC FDL with a **Canvas Template** may, or may not contain source FDL data. However, if an ASC FDL contains the source file's FDL data (**Canvas**, **Framing Decision**, etc) this data can be used for the implementation's decision making on normalizing framing.

For ASC FDL files that do not contain the source files **Framing Decisions**, implementations will need to look for ASC FDL data for each source file they intend to use the **Canvas Template** on.

7.6.1 Applying Canvas Templates

For a **Canvas Template** to be used by any application, the application would need to know which source FDL data (**Canvas**, **Framing Decision**) it should be utilizing. It is not within scope of this specification to mandate how an implementation will request a user to point the application to specific FDLs for this source data.

Child Elements:**7.6.2 label:**

The **label** field is a user defined field available to categorize/manage FDL data. As an example: "VFX Pull".

Note: Using UTF-8 strings with non-ASCII characters may have compatibility issues on some software.

As an example:

```
"label": "VFX Pull",
```

Data Type: string

Required Field: No

7.6.3 id:

The **Canvas Template id** field is meant to provide a means of identification for a **Canvas Template**. This **id** is not universally unique, but no other **Canvas Template id** within a single FDL will use the same **id**. The **Canvas Template id** field shall be between 1-32 characters in length and will allow for use of alphanumeric characters and underscores.

The **id** data will be formatted as follows:

```
"id": "value",
```

As an example:

```
"id": "VX220310",
```

As an example:

```
"id": "VX220310",
```

Data Type: string

Required Field: Yes

7.6.4 target_dimensions:

For a **Canvas Template** to be utilized, the user will choose a specific set of dimensions. Using the **fit_source** attribute they can specify what specifically to fit into this **target_dimensions**. As an example, a user may choose a target dimension of: {"width": 3840, "height": 2160 } and a fit source of **Framing Decision**. That would mean the user wants to fit the framing decision into the **target_dimensions** of 3840 x 2160.

The **target_dimensions** data will be formatted as follows:

```
"target_dimensions": {"width": integer, "height": integer},
```

As an example:

```
"target_dimensions": {"width": 3840, "height": 2160},
```

For an ASC FDL to utilize a **canvas template**, this field must be populated. If it is left blank, any application reading the ASC FDL should flag this field as missing and the **canvas template** cannot be used.

As an example:

```
"target_dimensions": {"width": 3840, "height": 2160},
```

Data Type: "width": integer, "height": integer

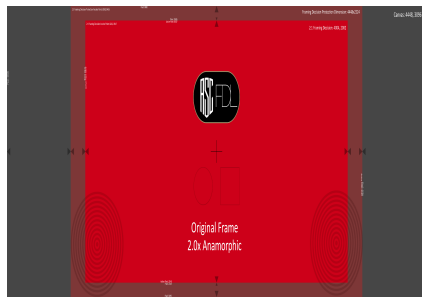
Required Field: Yes

Unit Type: Pixels

7.6.5 **target_anamorphic_squeeze:**

The **target_anamorphic_squeeze** field represents the squeeze factor we are forcing on any incoming media when placed into this new **Canvas**. As an example, if 1.0 is written as the **target_anamorphic_squeeze**; that means the user wants everything to be normalized to a squeeze factor of 1.0. Therefore media that was originally captured squeezed at 2.0 would be horizontally stretched to 1.0. If other media was captured at 1.3, it would be horizontally stretched to become 1.0. If other media was shot spherically at 1.0, it would remain 1.0.

2.0:1 Source:



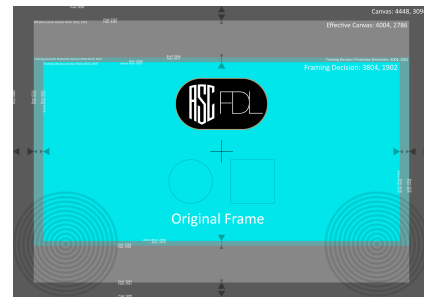
Result: 1.0:1

1.33:1 Source

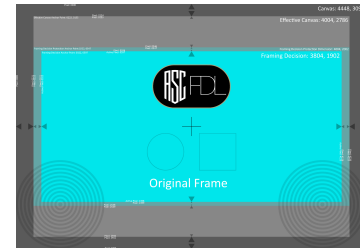


Result: 1.0:1

1.0:1 source



Result: 1.0:1



If a value of 0 has been used within the `target_anamorphic_squeeze` field, all media should be left to their source squeeze factor defined in the source FDL's `anamorphic_squeeze`. This is similar to some applications using the terminology of Same As Source. Therefore, if an incoming acquisition was shot at 2.00 anamorphic, and the user set the `target_anamorphic_squeeze` to 0, it would remain 2.00.

The source's squeeze factor must be defined in order for the `target_anamorphic_squeeze` attribute to work. This is available as the `anamorphic_squeeze` in the source ASC FDL's `Canvas`.

Any application performing this process will need to apply the squeeze factor before any Fit operation (scaling). The order of operations will be: Desqueeze and then Scale, to ensure consistency between applications.

This field's formatting will follow the image deformation numbering system typically used by lens manufacturers. As an example, 1.3 or 2. The formatting will specifically be:

```
"target_anamorphic_squeeze": float
```

Note: Any user interface used to manually specify pixel aspects should support at least 5 decimal place precision, to ensure that unsqueezed images are likely to be correct to the nearest pixel.

As an example:

```
"target_anamorphic_squeeze": 1.00,
```

Data Type: float (greater than 0)

Required Field: Yes

7.6.6 **fit_source:**

After determining a **target_dimensions**, the user will need to choose which region to fit into the **target_dimensions** from the source files. Available options will be:

- **framing_decision.dimensions**
- **framing_decision.protection_dimensions**
- **canvas.dimensions**
- **canvas.effective_dimensions**

For the **Canvas Template** to successfully target specific regions to place into the **target_dimensions**, the incoming media will require associated ASC FDL data.

The fit source field will be formatted as follows:

```
"fit_source": "value",
```

As an example:

```
"fit_source": "framing_decision.dimensions",
```

Data Type: Enum

Required Field: Yes

Allowed Values:

- **framing_decision.dimensions**
- **framing_decision.protection_dimensions**
- **canvas.dimensions**
- **canvas.effective_dimensions**

7.6.7 **fit_method:**

The **fit_method** attribute specifies how to fit the **fit_source** selection into the **target_dimensions**.

Any implementation shall apply the squeeze factor before any Fit (scaling). Therefore the order of operations shall be: Desqueeze > Fit/Scale

The fit method field will be formatted as follows:

```
"fit_method": "value",
```

Available Attributes: Width, Height, Fit All

width

The selected **fit_source** attribute's width should be fit into the **target_dimensions** regardless of whether the height is cropped, or doesn't fill the **target_dimensions** height.

height

The selected `fit_source` attribute's `height` should be fit into the target dimension regardless of whether the width is cropped, or doesn't fill the `target_dimensions` width.

fit_all

The selected `fit_source` attribute should be fit into the `target_dimensions`, not cropping anything from either the height or width.

fill

The selected `fit_source` attribute should fill the entire `target_dimensions`, therefore potentially cropping the height or width of the selected `fit_source`.

As an example:

```
"fit_method": "width",
```

Data Type: Enum

Required Field: Yes

Allowed Values: width, height, fit_all, fill

7.6.8 `alignment_method_vertical`:

The alignment method allows users to choose to offset their frame vertically, or horizontally. The `alignment_method_vertical`, allows the ability to specifically alter the position of the source vertically.

The alignment method vertical field will be formatted as follows:

```
"alignment_method_vertical": "value",
```

As an example:

```
"alignment_method_vertical": "center",
```

As an example:

```
"alignment_method_vertical": "center",
```

Data Type: Enum

Required Field: No

Allowed Values: top, center, bottom

Default Value: center

7.6.9 **alignment_method_horizontal:**

The alignment method allows users to choose to offset their frame vertically, or horizontally. The **alignment_method_horizontal**, allows the ability to specifically alter the position of the source horizontally.

The alignment method horizontal field will be formatted as follows:

```
"alignment_method_horizontal": "value",
```

As an example:

```
"alignment_method_horizontal": "center",
```

Data Type: Enum

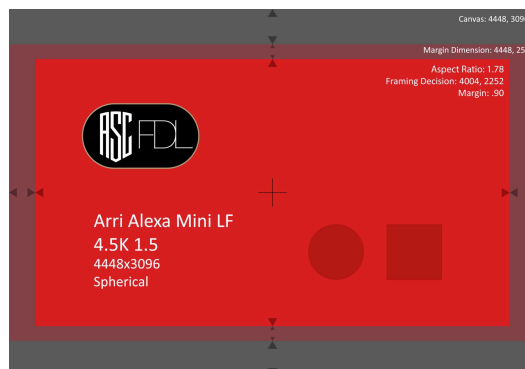
Required Field: No

Allowed Values: left, center, right

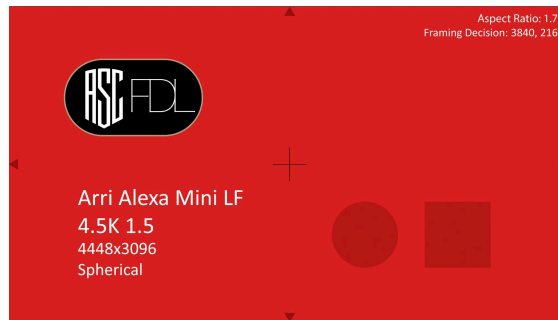
Default Value: center

7.6.10 **preserve_from_source_canvas:**

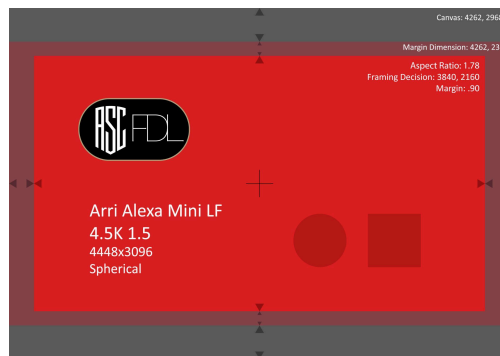
Once a region from the source has been chosen to fit into the **target_dimensions**, the user may choose to preserve a larger area outside of the chosen **fit_source**. Here is an example source image we'll be working with:



In the example above, the source **Canvas** was 4448 x 3096 and the framing decision within was 4004 x 2502. Using the **Canvas Template**, the user may choose to fit the **Framing Decision** into the **Target Dimension** of 3840 x 2160. The user then has the option to either preserve the area outside of this **Framing Decision**, or cut it off. Here is an example if the user had chosen **framing_decision.dimensions** for **preserve_from_source_canvas**:



Therefore nothing is maintained outside of the **Framing Decision** and the **Canvas** remains 3840 x 2160. If the user had chosen **canvas.dimensions** for **preserve_from_source_canvas**, the resulting image would have expanded outward within a new **Canvas dimensions** of 4262 x 2968.



This field will be formatted as follows:

```
"preserve_from_source_canvas": "value",
```

As an example:

```
"preserve_from_source_canvas": "canvas.dimensions",
```

Data Type: Enum

Required Field: No

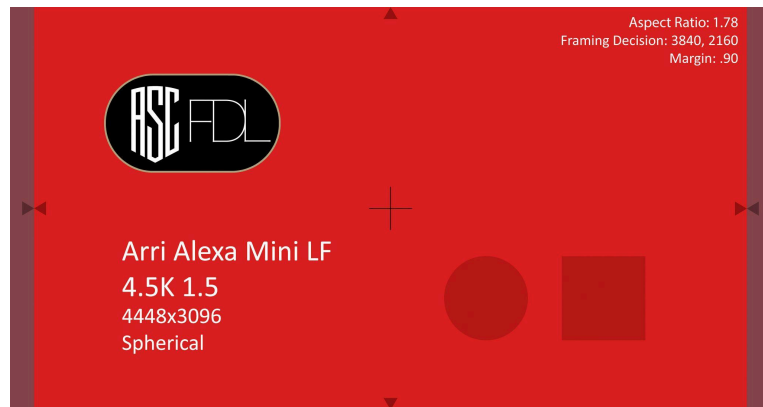
Allowed Values:

- none
- framing_decision.dimensions
- framing_decision.protection_dimensions
- canvas.dimensions
- canvas.effective_dimensions

Default Value: none

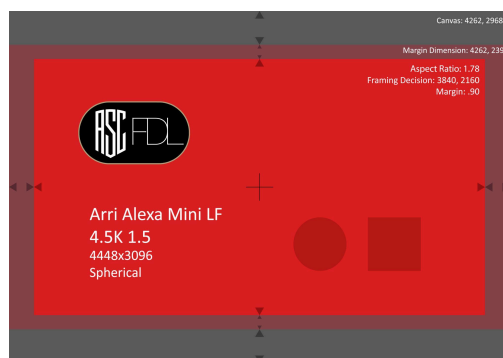
7.6.11 **maximum_dimensions:**

The **maximum_dimensions** attribute will determine any newly generated **Canvas**' maximum dimensions. In the example used above for the **preserve_from_source** attribute, if a user had chosen to preserve the **Canvas**, but also set the **maximum_dimensions** to 4096 x 2160, the resulting **Canvas** would have been cropped (not scaled) resulting in a 4096 x 2160.



However, if the user had not defined **maximum_dimensions**, the resulting image would not have been cropped.

If the user as an example chose a maximum dimension of 5000 x 3496, the resulting image would still remain 4262 x 2968, as this attribute does not force any kind of scaling.



maximum_dimensions will always take priority over the **preserve_from_source** results.

maximum_dimensions does not have any requirements on the aspect ratio utilized.

The formatting for this attribute is as follows:

```
"maximum_dimensions": {"width": integer, "height": integer}
```

As an example:

```
"maximum_dimensions": {"width": 5000, "height": 3496},
```

Data Type: "width": integer, "height": integer

Required Field: No

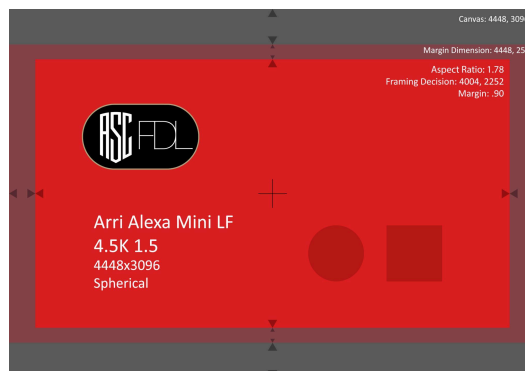
Default Value: Omitted

7.6.12 pad_to_maximum:

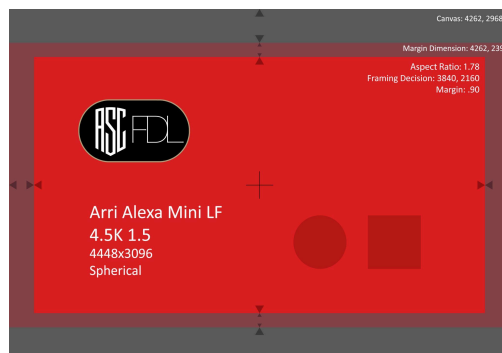
As specified in section 8.6.12, the `maximum_dimensions` field only ensures that a `Canvas` is no larger than a specified dimension. Therefore, resulting `Canvases` from different inputs could vary in dimensions if they do not exceed the `maximum_dimensions`. The `pad_to_maximum` forces resulting `Canvases` to the specified `maximum_dimensions`. However it does not scale the image. Instead it adds pillarboxing, or letterboxing if needed.

As an example:

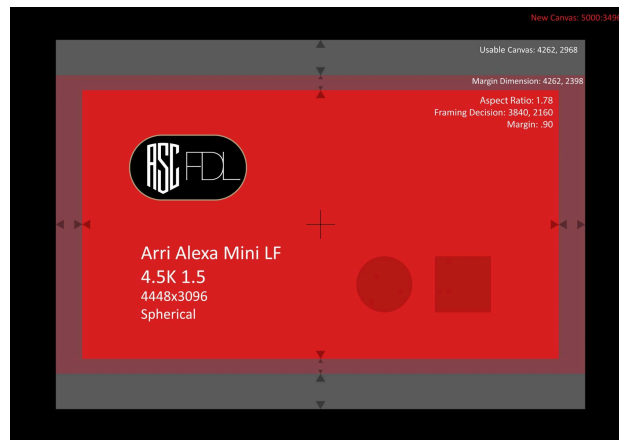
Here is our source, which has a `Canvas` of 4448 x 3096



The user has chosen a `fit_method` of `framing_decision.dimensions` and a `dimensions` of 3840 x 2160, and utilized a `maximum_dimensions` of 5000 x 3496. With the `pad_to_maximum` field set to `false`, this would have resulted in a `Canvas` of 4262 x 2968. i.e.; not forcing the `Canvas` to be the `maximum_dimensions`.



If the `pad_to_maximum` was set to true, this would have resulted in a new `Canvas` that is 5000 x 3496, with the resulting image both pillarboxed and letterboxed, considering the `pad_to_maximum` field does not force any scaling:



If the `maximum_dimensions` attribute is blank, the `pad_to_maximum` attribute will be disregarded.

Formatting for this attribute will be as follows:

```
"pad_to_maximum": value,
```

As an example:

```
"pad_to_maximum": "true",
```

Data Type: boolean

Required Field: No

Default Value: false

7.6.13 `round`:

Users may want to control whether a newly created `Canvas`' `dimensions` are allowed to contain odd number values. As an example, many users may choose to force any newly created canvas to be an even number of pixels. Different platforms handle rounding in different ways, so defining the rounding "rules" ensures consistency in scaling behavior between platforms. Rounding is one of the key variables that can be defined within a template to ensure consistent results.

The `round` field is only applicable to the final resulting `Canvas dimensions` and should not affect the `fit_source` or `target_dimensions`.

`whole` = to nearest integer

`even` = to nearest even-numbered integer

up = always round up

down = always round down

round = follow standard rounding rules (round up for values greater than or equal to +0.5, down for values less than +0.5)

In the case of resulting **canvas_dimensions** defined in a template (if **pad_to_maximum** is **true**) then rounding isn't applicable because that dimension must be filled.

If a resulting **Canvas** needs to have rounding applied, the **Canvas** should never be stretched, squished, or scaled. Instead padding, or cropping should occur.

The formatting for this field will be as follows:

```
"round": {"even": "value", "mode": "value"}
```

As an example:

```
"round": {"even": "whole", "mode": "up"}
```

Data Type: "even": Enum, "mode": Enum

Allowed Values for 1st Enum ('even'): whole, even

Allowed Values for 2nd Enum ('mode'): up, down, round

Required Field: No

Default Value: "even": "even", "mode": "up"

8.0 Appendix

Appendix A: Example ASC FDL

```
{
  "uuid": "BCD142EB-3BAA-4EA8-ADD8-A46AE8DC4D97",
  "version": {"major": 1, "minor": 1},
  "fdl_creator": "ASC FDL Committee",
  "default_framing_intent": "FDLSMP01",
  "framing_intents": [{
    "label": "2-1 Framing",
    "id": "FDLSMP01",
    "aspect_ratio": {"width": 2, "height": 1},
    "protection": 0.1
  }
],
  "contexts": [{
    "label": "ArriLF",
    "context_creator": "ASC FDL Committee",
    "canvases": [{
      "label": "Open Gate RAW",
      "id": "20220310",
      "source_canvas_id": "20220310",
      "dimensions": {"width": 4448, "height": 3096},
      "effective_dimensions": {"width": 4448, "height": 3096},
      "effective_anchor_point": {"x": 0, "y": 0},
      "photosite_dimensions": {"width": 4448, "height": 3096},
      "physical_dimensions": {"width": 36.7, "height": 25.54},
      "anamorphic_squeeze": 1,
      "framing_decisions": [{
        "label": "2-1 Framing",
        "id": "20220310-FDLSMP01",
        "framing_intent_id": "FDLSMP01",
        "dimensions": {"width": 4004, "height": 2002},
        "anchor_point": {"x": 222, "y": 547},
        "protection_dimensions": {"width": 4448, "height": 2224},
        "protection_anchor_point": {"x": 0, "y": 436}
      ]
    }
  ]
}]
}
```

Appendix B:

Example ASC FDL JSON File With 2 Framing Decisions

```
{
  "uuid": "DEAF6B84-6B8C-46DB-8CE3-DA5DAB8C9817",
  "version": {"major": 1, "minor": 1},
  "fdl_creator": "Jane Doe",
  "default_framing_intent": "29A901F1",
  "framing_intents": [{
    "label": "Hero 1.78",
    "id": "29A901F1",
    "aspect_ratio": {"width": 16, "height": 9},
    "protection": 0.05
  },
  {
    "label": "Hero 2-1",
    "id": "0302684B",
    "aspect_ratio": {"width": 2, "height": 1},
    "protection": 0.05
  }
  ],
  "contexts": [{
    "label": "ArriLF",
    "context_creator": "Arri LF",
    "canvases": [{
      "label": "Open Gate ARRIRAW",
      "id": "20210902",
      "source_canvas_id": "20210902",
      "dimensions": {"width": 4448, "height": 3096},
      "effective_dimensions": {"width": 4448, "height": 3096},
      "effective_anchor_point": {"x": 0, "y": 0},
      "photosite_dimensions": {"width": 4448, "height": 3096},
      "physical_dimensions": {"width": 36.7, "height": 25.54},
      "anamorphic_squeeze": 1,
      "framing_decisions": [{
        "label": "Hero 1.78",
        "id": "20210902-29A901F1",
        "framing_intent_id": "29A901F1",
        "dimensions": {"width": 4226, "height": 2376},
        "anchor_point": {"x": 111, "y": 360},
```

```

        "protection_dimensions": {"width": 4448, "height": 2508},
        "protection_anchor_point": {"x": 0, "y": 294}
    },
    {
        "label": "Hero 2-1",
        "id": "20210902-0302684B",
        "framing_intent_id": "0302684B",
        "dimensions": {"width": 4224, "height": 2112},
        "anchor_point": {"x": 112, "y": 492},
        "protection_dimensions": {"width": 4448, "height": 2224},
        "protection_anchor_point": {"x": 0, "y": 436}
    }
]
}]
}

```

Appendix C:

Example ASC FDL JSON File With only the Canvas Template

```

{
  "uuid": "3E9F94EF-A910-470D-8EC4-B14E551AC6AB",
  "version": {"major": 1, "minor": 1},
  "fdl_creator": "The Camera",
  "default_framing_intent": "FDLSMP05",
  "framing_intents": [{
    "label": "2.39 Framing",
    "id": "FDLSMP05",
    "aspect_ratio": {"width": 2048, "height": 858},
    "protection": 0.1
  }
],
  "canvas_templates": [{
    "label": "VFX Pull",
    "id": "VX220310",
    "target_dimensions": {"width": 4096, "height": 1716},
    "target_anamorphic_squeeze": 1,
    "fit_source": "framing_decision.dimensions",
    "fit_method": "width",
    "alignment_method_vertical": "center",
    "alignment_method_horizontal": "center",
    "preserve_from_source_canvas": "canvas.dimensions",
    "round": {"even": "even", "mode": "up"}
  }
],
}

```



```
{
  "label": "Editorial Dailies",
  "id": "ED220310",
  "target_dimensions": {"width": 1920, "height": 1080},
  "target_anamorphic_squeeze": 1.00,
  "fit_source": "framing_decision.dimensions",
  "fit_method": "width",
  "alignment_method_vertical": "center",
  "alignment_method_horizontal": "center",
  "preserve_from_source_canvas": "framing_decision.dimensions",
  "round": {"even": "even", "mode": "up"}
}]
}
```

Appendix D:

Example ASC FDL JSON File With Effective Canvas

```
{
  "uuid": "5EDD03DC-4EFF-42BB-8085-DDECC3036982",
  "version": {"major": 1, "minor": 1},
  "fdl_creator": "ASC FDL Committee",
  "default_framing_intent": "FDLSMP04",
  "framing_intents": [{
    "label": "2-1 Framing",
    "id": "FDLSMP04",
    "aspect_ratio": {"width": 2, "height": 1},
    "protection": 0.05
  }],
  "contexts": [{
    "label": "ArriLFV",
    "context_creator": "ASC FDL Committee",
    "canvases": [{
      "label": "Open Gate Vignette",
      "id": "20220311",
      "source_canvas_id": "20220311",
      "dimensions": {"width": 4448, "height": 3096},
      "effective_dimensions": {"width": 4004, "height": 2786},
      "effective_anchor_point": {"x": 222, "y": 155},
```

```

    "photosite_dimensions": {"width": 4448, "height": 3096},
    "physical_dimensions": {"width": 36.7, "height": 25.54},
    "anamorphic_squeeze": 1,
    "framing_decisions": [{
      "label": "2-1 Framing",
      "id": "20220311-FDLSMP04",
      "framing_intent_id": "FDLSMP04",
      "dimensions": {"width": 3804, "height": 1902},
      "anchor_point": {"x": 0, "y": 392},
      "protection_dimensions": {"width": 4004, "height": 2002},
      "protection_anchor_point": {"x": 100, "y": 442}
    ]
  ]
}]
}

```

Appendix E: ASC FDL Represented in an ALE

A user may choose to communicate which ASC FDL should be applied to which shot through a metadata exchange file such as an ALE. There are two columns that should be provided in an ALE in order for any application to know which FDL to apply to any given shot:

- fdl-uuid
- fdl-framing-decision-id

The **uuid** field will be able to tell any application down stream which ASC FDL file to use for that particular shot. Whereas the **framing decision id** will tell the application which specific frame within the FDL to use.

Appendix F: ASC FDL Data Placed within the header of a file:

A user may choose to communicate which ASC FDL should be applied to which shot by adding the necessary FDL info to the header of a rendered file. There are two key pieces of data that should be shared in order for any application to know which FDL to apply to any given shot:

- fdl-uuid
- fdl-framing-decision-id

The **uuid** field will be able to tell any application down stream which ASC FDL file to use for that particular shot. Whereas the **framing decision id**, will tell the application which specific frame within the FDL to use.

Appendix G: ASC FDL Represented in an EDL

A user may choose to communicate which ASC FDL should be applied to which shot by adding the necessary FDL info to the comments section of an EDL. There are two key pieces of data that should be shared in order for any application to know which FDL to apply to any given shot:

- fdl-uuid
- fdl-framing-decision-id

The **uuid** field will be able to tell any application down stream which ASC FDL file to use for that particular shot. Whereas the **framing decision id** will tell the application which specific frame within the FDL to use.

The formatting of these values should be as follows:

- * FDL-UUID: value
- * FDL-FRAMING-DECISION-ID: value

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