
pyaaf2 Documentation

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pyaaf2 is a python module for the reading and writing Advanced Authoring Format (AAF) files.

1.1 Quickstart

1.1.1 Installing

You can install pyaaf2 via:

```
pip install pyaaf2
```

or if you want to use the latest development git master:

```
git clone https://github.com/markreidvfx/pyaaf2
cd pyaaf2
python setup.py install
```

1.1.2 Reading

```
import aaf2

with aaf2.open("path/to/file.aaf", "r") as f:

    # get the main composition
    main_compostion = next(f.content.toplevel())

    # print the name of the composition
    print(main_compostion.name)

    # AAFObjects have properties that can be
```

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```
# accessed just like a dictionary
print(main_compostion['CreationTime'].value)

# video, audio and other track types are
# stored in slots on a mob object.
for slot in main_compostion.slots:
    segment = slot.segment
    print(segment)
```

1.1.3 Embedding Footage

First lets generate some DNxHR media with ffmpeg:

```
ffmpeg -f lavfi -i testsrc=size=960x540 -frames:v 24 -vcodec dnxhd -pix_fmt yuv422p -
↳profile:v dnxhr_lb sample.dnxhd
```

Now lets generate some audio media:

```
ffmpeg -f lavfi -i aevalsrc="sin(420*2*PI*t):s=48000:d=1.0" -acodec pcm_s16le sample.
↳wav
```

Finally import the footage:

```
import aaf2

with aaf2.open("example2.aaf", 'w') as f:

    # objects are create with a factory
    # on the AAFFile Object
    mob = f.create.MasterMob("Demo2")

    # add the mob to the file
    f.content.mobs.append(mob)

    edit_rate = 25

    # lets also create a tape so we can add timecode (optional)
    tape_mob = f.create.SourceMob()
    f.content.mobs.append(tape_mob)

    timecode_rate = 25
    start_time = timecode_rate * 60 * 60 # 1 hour
    tape_name = "Demo Tape"

    # add tape slots to tape mob
    tape_mob.create_tape_slots(tape_name, edit_rate,
                              timecode_rate, media_kind='picture')

    # create sourceclip that references timecode
    tape_clip = tape_mob.create_source_clip(1, start_time)

    # now finally import the generated media
    mob.import_dnxhd_essence("sample.dnxhd", edit_rate, tape_clip)
    mob.import_audio_essence("sample.wav", edit_rate)
```

1.2 About the AAF File Format

AAF is a file format used for professional multimedia creation and authoring. The file specification is managed by the [Advanced Media Workflow Association \(AMWA\)](#).

AAF uses a object-oriented data model. The data model has a single inheritance class hierarchy and classes have properties that store metadata. Classes, properties, and types each have unique ids, known as a Authoring Unique Identifier (AUID). AAF and MXF are closely related, The AAF data model is the basis for the MXF data model.

The Compound File Binary Format (CFBF) is what AAF uses for binary storage. CFBF, also called Structured Storage or Object Linking and Embedding (OLE), is a file format developed by Microsoft for storing hierarchical data. CFBF is basically a FAT32 filesystem in a file and AAF uses “directories” as classes and “files” to store property metadata.

1.2.1 Further Reading

- [aafobjectspect-v1.1.pdf](#)
- [aafeditprotocol.pdf](#)
- [aafstoredformatspect-v1.0.1.pdf](#)
- [aafcontainerspect-v1.0.1.pdf](#)
- [AAF SDK](#)
- [Media Authoring with Java API \(MAJ\)](#)
- [Advanced Authoring Format Wikipedia](#)
- [Compound File Binary Format Wikipedia](#)
- [COM Structured Storage Wikipedia](#)

1.3 aaf2 package

1.3.1 Submodules

1.3.1.1 aaf2.ama module

`aaf2.ama.get_wave_fmt(path)`

Returns a bytearray of the WAVE RIFF header and fmt chunk for a *WAVEDescriptor Summary*

`aaf2.ama.get_aifc_fmt(path)`

Compute the AIFC header information for a *AIFCDescriptor Summary*

Parameters `path` – file to read chunk from

Returns a *bytearray*

`aaf2.ama.create_network_locator(f, absolute_path)`

class `aaf2.ama.FormatInfo(metadata)`

Bases: `object`

Provides convenient access to commonly-used datums

streams

first_sound_stream

first_picture_stream

create_descriptor (*f, path*)

container_guid

edit_rate

Returns The edit rate of the first picture stream, or if there are none, the first sound stream.

length

Returns The length of the first picture stream, or if there are none, the first sound stream.

create_wav_descriptor (*f, path*)

create_aifc_descriptor (*f, path*)

coalesce_descriptors (*f, descriptors, path*)

create_multistream_descriptor (*f, path*)

class aaf2.ama.StreamInfo (*metadata*)

Bases: object

codec_type

codec_name

is_sound

is_picture

edit_rate

length

physical_track_count

create_pcm_descriptor (*f*)

pixel_sizes ()

get_avc_compression ()

get_compression ()

create_video_descriptor (*f*)

aaf2.ama.create_media_link (*f, path, metadata*)

Create an essence linked to external media and all obligatory mobs and data structures required by the edit spec.

The returned `aaf.mobs.MasterMob` will have one slot for each video stream and each audio channel in the file at *path*.

Example: The linked file is a Quicktime movie with picture and a stereo audio track. This function will create a `SourceMob` with three slots, one picture slot, and two sound slots, for audio channels one and two respectively. The function will also create a derivation `SourceMob`, linked to these slots.

Parameters

- **f** – The `aaf.File` to add this link to
- **path** – A path recognizable to `os.path`
- **metadata** – Pre-fetched media description (in the form of a dictionary) from “ffprobe -show_format -show_streams”

Returns A `aaf.mobs.MasterMob` linked to the file at link.

1.3.1.2 aaf2.audio module

```
class aaf2.audio.WaveReader(f)  
    Bases: wave.Wave_read  
  
    getblockalign()
```

1.3.1.3 aaf2.auid module

```
class aaf2.auid.AUID(hex=None, bytes_le=None, bytes_be=None, int=None)  
    Bases: object  
  
    A higher performance UUID class that is more specialized for AAF.  
  
    bytes_le  
    bytes_be  
    int  
    hex  
    uuid  
    data1  
    data2  
    data3  
    data4
```

1.3.1.4 aaf2.cache module

```
class aaf2.cache.LRUNode  
    Bases: object  
  
class aaf2.cache.LRUCacheDict(size=512)  
    Bases: object  
  
    make_first(node)  
    get(key, default=None)
```

1.3.1.5 aaf2.cfb module

```
aaf2.cfb.pretty_sectors(fat)  
  
class aaf2.cfb.Stream(storage, entry, mode='r')  
    Bases: object  
  
    storage  
    dir  
    mode  
    pos  
    fat_chain  
    tell()
```

```
seek (offset, whence=0)
is_mini_stream()
sector_size()
sector_offset()
sector_index()
read (n=-1)
allocate (byte_size)
write (data)
truncate (size=None)
close()

aaf2.cfb.is_red (entry)
aaf2.cfb.is_not_red (entry)
aaf2.cfb.is_parent_of (parent, entry)
aaf2.cfb.validate_rbtrees (root)
aaf2.cfb.jsw_single (root, direction)
aaf2.cfb.jsw_double (root, direction)
aaf2.cfb.find_entry_parent (root, entry, max_depth)
aaf2.cfb.get_entry_path (root, entry, max_depth)
class aaf2.cfb.DirEntry (storage, dir_id, data=None)
    Bases: object
        storage
        parent
        data
        dir_id
        name
        type
        color
        red
        left_id
        right_id
        child_id
        class_id
        flags
        create_time
        modify_time
        sector_id
```

```
byte_size
mark_modified()
left()
right()
child()
add_child(entry)
insert(entry)
    Inserts entry into child folder tree.  Tries to maintain a balanced red black tree.  Tech-
    nique is base on topdown insert approach in described in https://eternallyconfuzzled.com/
    red-black-trees-c-the-most-common-balanced-binary-search-tree
pop()
    remove self from self.parent folder binary search tree.  Tries to maintain a balanced red black
    tree.  Technique is base on topdown remove approach in described in https://eternallyconfuzzled.com/
    red-black-trees-c-the-most-common-balanced-binary-search-tree
rebalance_children_tree()
path()
open(mode='r')
isdir()
isroot()
listdir()
mkdir(relative_path, class_id=None)
isfile()
get(name, default=None)
touch(name)
write()
read()

aaf2.cfb.extend_sid_table(f, table, byte_size)

class aaf2.cfb.CompoundFileBinary(file_object, mode='rb', sector_size=4096)
    Bases: object
    close()
    setup_empty(sector_size)
    write_header()
    read_header()
    iter_difat()
    write_difat()
    read_fat()
    write_fat()
    read_minifat()
```

write_minifat()
write_modified_dir_entries()
write_dir_entries()
next_free_minifat_sect()
next_free_sect()
read_sector_data(sid)
get_sid_offset(abs_pos)
dir_entry_sid_offset(dir_id)
dir_entry_pos(dir_id)
read_dir_entry(dir_id, parent=None)
clear_sector(sid)
next_free_dir_id()
get_fat_chain(start_sid, minifat=False)
mini_stream_grow()
fat_chain_append(start_sid, minifat=False)
free_fat_chain(start_sid, minifat=False)
create_dir_entry(path, dir_type='storage', class_id=None)
free_dir_entry(entry)
remove(path)
Removes both streams and storage DirEntry types from file. storage type entries need to be empty dirs.
rmtree(path)
Removes directory structure, similar to shutil.rmtree.
listdir(path=None)
Return a list containing the DirEntry objects in the directory given by path.
listdir_dict(path=None)
Return a dict containing the DirEntry objects in the directory given by path with name of the dir as key.
find(path)
find a DirEntry located at *path*. Returns None if path does not exist.
walk(path=None, topdown=True)
Similar to os.walk(), yeields a 3-tuple (root, storage_items, stream_items)
validate_directory_structure()
exists(path)
Return True if path refers to a existing path.
makedir(path, class_id=None)
Create a storage DirEntry name path
makedirs(path)
Recursive storage DirEntry creation function.
move(src, dst)
Moves DirEntry from src to dst

```
open (path, mode='r')
    Open stream, returning Stream object
```

1.3.1.6 aaf2.components module

```
class aaf2.components.Component (media_kind=None, length=None)
    Bases: aaf2.core.AAFObject
    class_id = 0d010101-0101-0200-060e-2b3402060101
    length
    datadef
    media_kind

class aaf2.components.Segment (media_kind=None, length=None)
    Bases: aaf2.components.Component
    class_id = 0d010101-0101-0300-060e-2b3402060101

class aaf2.components.Transition (media_kind=None, length=None)
    Bases: aaf2.components.Component
    class_id = 0d010101-0101-1700-060e-2b3402060101
    cutpoint

class aaf2.components.Sequence (media_kind=None, length=None)
    Bases: aaf2.components.Segment
    class_id = 0d010101-0101-0f00-060e-2b3402060101
    components
    component_at_time (edit_unit)
    index_at_time (edit_unit)
    positions ()

class aaf2.components.NestedScope (media_kind=None, length=None)
    Bases: aaf2.components.Segment
    class_id = 0d010101-0101-0b00-060e-2b3402060101
    slots

class aaf2.components.SourceReference (media_kind=None, length=None)
    Bases: aaf2.components.Segment
    class_id = 0d010101-0101-1000-060e-2b3402060101
    mob_id
    slot_id
    mob
    slot

class aaf2.components.SourceClip (start=None, length=None, mob_id=None, slot_id=None, media_kind=None)
    Bases: aaf2.components.SourceReference
    class_id = 0d010101-0101-1100-060e-2b3402060101
```

```
    start
    walk()

class aaf2.components.Filler(media_kind=None, length=None)
    Bases: aaf2.components.Segment
    class_id = 0d010101-0101-0900-060e-2b3402060101

class aaf2.components.EssenceGroup(media_kind=None, length=None)
    Bases: aaf2.components.Segment
    class_id = 0d010101-0101-0500-060e-2b3402060101

class aaf2.components.EdgeCode(media_kind=None, length=None)
    Bases: aaf2.components.Segment
    class_id = 0d010101-0101-0400-060e-2b3402060101

class aaf2.components.Pulldown(media_kind=None, length=None)
    Bases: aaf2.components.Segment
    class_id = 0d010101-0101-0c00-060e-2b3402060101

class aaf2.components.ScopeReference(media_kind=None, length=None)
    Bases: aaf2.components.Segment
    class_id = 0d010101-0101-0d00-060e-2b3402060101

class aaf2.components.Selector(media_kind=None, length=None)
    Bases: aaf2.components.Segment
    class_id = 0d010101-0101-0e00-060e-2b3402060101

class aaf2.components.Timecode(fps=25, drop=False, length=None)
    Bases: aaf2.components.Segment
    class_id = 0d010101-0101-1400-060e-2b3402060101
    start
    fps
    drop

class aaf2.components.OperationGroup(operationdef, length=None, media_kind=None)
    Bases: aaf2.components.Segment
    class_id = 0d010101-0101-0a00-060e-2b3402060101
    operation
    parameters
    segments

class aaf2.components.Event
    Bases: aaf2.components.Segment
    class_id = 0d010101-0101-0600-060e-2b3402060101

class aaf2.components.CommentMarker
    Bases: aaf2.components.Event
    class_id = 0d010101-0101-0800-060e-2b3402060101

class aaf2.components.DescriptiveMarker
    Bases: aaf2.components.CommentMarker
```

```
class_id = 0d010101-0101-4100-060e-2b3402060101
```

1.3.1.7 aaf2.content module

```
class aaf2.content.Header(*args, **kwargs)
```

Bases: *aaf2.core.AAFObject*

```
class_id = 0d010101-0101-2f00-060e-2b3402060101
```

```
class aaf2.content.ContentStorage(*args, **kwargs)
```

Bases: *aaf2.core.AAFObject*

This object has all Mob and EssenceData objects in the file

```
class_id = 0d010101-0101-1800-060e-2b3402060101
```

mobs

Access to all the Mobs objects in the aaf file.

toplevel()

Convenience generator method that yields only TopLevel *aaf2.mobs.CompositionMob* objects.

mastermobs()

Convenience generator method that yields only *aaf2.mobs.MasterMob* objects.

compositionmobs()

Convenience generator method that yields only *aaf2.mobs.CompositionMob* objects.

sourcemobs()

Convenience generator method that yields only *aaf2.mobs.SourceMob* objects.

link_external_mxf(path)

link_external_wav(metadata)

Create a link source MOB to a wav file, along with a corresponding master MOB and tape MOB.

Returns a 3-tuple: a master mob, the source MOB whose essence is a WAVEDescriptor link, and a source MOB whose essence is a TapeDescriptor.

create_ama_link(path, metadata)

essencedata

Access to *aaf2.essence.EssenceData* objects in the aaf file.

1.3.1.8 aaf2.core module

```
class aaf2.core.AAFObject(*args, **kwargs)
```

Bases: object

classdef

name

unique_property

unique_key

read_properties()

validate()

write_properties(validate=True)

detach(delete=False)

```
attach (dir_entry)
walk_references (topdown=False)
copy (new_dir=None, root=None, classdef_cache=None)
properties ()
allkeys ()
keys ()
get (key, default=None, allkeys=True)
getvalue (key, default=None)
dump (space="")
class_id
dir
property_entries
root
```

1.3.1.9 aaf2.dictionary module

```
aaf2.dictionary.short_name (name)
aaf2.dictionary.lookup_def (dictionary, name, instance_type, key)
class aaf2.dictionary.DefinitionObject (auid=None, name=None, description=None)
    Bases: aaf2.core.AAFObject
    class_id = 0d010101-0101-1a00-060e-2b3402060101
    name
    short_name
    description
    auid
    uuid
    unique_key
class aaf2.dictionary.DataDef (auid=None, name=None, description=None)
    Bases: aaf2.dictionary.DefinitionObject
    class_id = 0d010101-0101-1b00-060e-2b3402060101
class aaf2.dictionary.OperationDef (auid=None, name=None, description=None)
    Bases: aaf2.dictionary.DefinitionObject
    class_id = 0d010101-0101-1c00-060e-2b3402060101
    datadef
    media_kind
    parameters
    number_inputs
```

```

class aaf2.dictionary.ParameterDef (auid=None, name=None, description=None, type-
                                   def=None)
    Bases: aaf2.dictionary.DefinitionObject
    class_id = 0d010101-0101-1d00-060e-2b3402060101
    typedef

class aaf2.dictionary.PluginDef (auid=None, name=None, description=None)
    Bases: aaf2.dictionary.DefinitionObject
    class_id = 0d010101-0101-1e00-060e-2b3402060101

class aaf2.dictionary.CodecDef (dictionary, auid=None, name=None, description=None, class-
                                def=None, datadef_names=None)
    Bases: aaf2.dictionary.DefinitionObject
    class_id = 0d010101-0101-1f00-060e-2b3402060101

class aaf2.dictionary.ContainerDef (auid=None, name=None, description=None)
    Bases: aaf2.dictionary.DefinitionObject
    class_id = 0d010101-0101-2000-060e-2b3402060101

class aaf2.dictionary.InterpolationDef (auid=None, name=None, description=None)
    Bases: aaf2.dictionary.DefinitionObject
    class_id = 0d010101-0101-2100-060e-2b3402060101

class aaf2.dictionary.TaggedValueDef (auid=None, name=None, description=None)
    Bases: aaf2.dictionary.DefinitionObject
    class_id = 0d010101-0101-4c00-060e-2b3402060101

class aaf2.dictionary.Dictionary
    Bases: aaf2.core.AAFObject
    class_id = 0d010101-0101-2200-060e-2b3402060101
    setup_defaults ()
    register_def (defobject)
    lookup_typedef (name)
    lookup_datadef (name)
    lookup_containerdef (name)
    lookup_codecdef (name)
    lookup_parameterdef (name)
    lookup_operationdef (name)
    lookup_interperlationdef (name)
    lookup_taggedvaluedef (name)
    update (other)

```

1.3.1.10 aaf2.essence module

```

class aaf2.essence.EssenceData (*args, **kwargs)
    Bases: aaf2.core.AAFObject
    class_id = 0d010101-0101-2300-060e-2b3402060101

```

```
unique_key
mob_id
mob
open (mode='r')

class aaf2.essence.EssenceDescriptor (*args, **kwargs)
    Bases: aaf2.core.AAFObject

    class_id = 0d010101-0101-2400-060e-2b3402060101
    locator

class aaf2.essence.FileDescriptor (*args, **kwargs)
    Bases: aaf2.essence.EssenceDescriptor

    class_id = 0d010101-0101-2500-060e-2b3402060101
    length

class aaf2.essence.DigitalImageDescriptor (*args, **kwargs)
    Bases: aaf2.essence.FileDescriptor

    class_id = 0d010101-0101-2700-060e-2b3402060101

class aaf2.essence.CDCIDescriptor (*args, **kwargs)
    Bases: aaf2.essence.DigitalImageDescriptor

    class_id = 0d010101-0101-2800-060e-2b3402060101

class aaf2.essence.RGBADescriptor (*args, **kwargs)
    Bases: aaf2.essence.DigitalImageDescriptor

    class_id = 0d010101-0101-2900-060e-2b3402060101
    pixel_layout

class aaf2.essence.TapeDescriptor (*args, **kwargs)
    Bases: aaf2.essence.EssenceDescriptor

    class_id = 0d010101-0101-2e00-060e-2b3402060101

class aaf2.essence.SoundDescriptor (*args, **kwargs)
    Bases: aaf2.essence.FileDescriptor

    class_id = 0d010101-0101-4200-060e-2b3402060101

class aaf2.essence.WAVEDescriptor (*args, **kwargs)
    Bases: aaf2.essence.FileDescriptor

    class_id = 0d010101-0101-2c00-060e-2b3402060101

class aaf2.essence.AIFCDescriptor (*args, **kwargs)
    Bases: aaf2.essence.FileDescriptor

    class_id = 0d010101-0101-2600-060e-2b3402060101

class aaf2.essence.DataEssenceDescriptor (*args, **kwargs)
    Bases: aaf2.essence.FileDescriptor

    class_id = 0d010101-0101-4300-060e-2b3402060101

class aaf2.essence.MultipleDescriptor (*args, **kwargs)
    Bases: aaf2.essence.FileDescriptor

    class_id = 0d010101-0101-4400-060e-2b3402060101
```

```

class aaf2.essence.PCMDescriptor(*args, **kwargs)
    Bases: aaf2.essence.SoundDescriptor

    class_id = 0d010101-0101-4800-060e-2b3402060101

class aaf2.essence.PhysicalDescriptor(*args, **kwargs)
    Bases: aaf2.essence.EssenceDescriptor

    class_id = 0d010101-0101-4900-060e-2b3402060101

class aaf2.essence.ImportDescriptor(*args, **kwargs)
    Bases: aaf2.essence.PhysicalDescriptor

    class_id = 0d010101-0101-4a00-060e-2b3402060101

```

1.3.1.11 aaf2.exceptions module

```

exception aaf2.exceptions.AAFError
    Bases: Exception

exception aaf2.exceptions.AAFAttachError
    Bases: aaf2.exceptions.AAFError

exception aaf2.exceptions.AAFPropertyError
    Bases: aaf2.exceptions.AAFError

exception aaf2.exceptions.CompoundFileBinaryError
    Bases: aaf2.exceptions.AAFError

```

1.3.1.12 aaf2.file module

```

class aaf2.file.AAFFactory(root)
    Bases: object

    from_name(name, *args, **kwargs)

    create_instance(*args, **kwargs)

class aaf2.file.AAFObjectManager(root)
    Bases: object

    create_temp_dir()

    remove_temp()

    add_modified(obj)

    pop(path, default=None)

    read_object(path)

    write_objects()

class aaf2.file.AAFFile(path=None, mode='r', sector_size=4096, extensions=True, buffering=8192)
    Bases: object

```

AAF File Object. This is the entry point object for most of the API. This object is designed to be like python's native open function. It is recommended to create this object with the *aaf.open* alias. It is also highly recommended to use the with statement.

Warning: If an exception is raised inside the with block and the file was opened as writable, the final file should be considered bad or corrupted.

Take this snippet as an example:

```
try:
    with aaf.open('/path/to/aaf_file.aaf', 'r+') as f:
        raise ValueError('asd')
except:
    pass
```

in this case, even if the exception is properly handled, the content of `/path/to/aaf_file.aaf` shouldn't be trusted anymore.

For example. Opening existing AAF file readonly:

```
with aaf.open('/path/to/aaf_file.aaf', 'r') as f:
```

Opening new AAF file overwriting existing one:

```
with aaf.open('/path/to/aaf_file.aaf', 'w') as f:
```

Opening existing AAF in read and write:

```
with aaf.open('/path/to/aaf_file.aaf', 'rw') as f:
```

Opening in memory BytesIO file:

```
with aaf.open() as f:
```

header

aaf2.content.Header object for AAF file.

content

aaf2.content.ContentStorage object for AAF File. This has the Mob and EssenceData objects.

dictionary

aaf2.dictionary.Dictionary for AAF file. The dictionary property has DefinitionObject objects.

setup_empty()

writable

resovle_weakref(index, ref_pid, ref)

weakref_prop(index)

weakref_index(pid_path)

read_reference_properties()

write_reference_properties()

dump()

save()

Writes current changes to disk and flushes modified objects in the AAFObjectManager

close()

Close the file. A closed file cannot be read or written any more.

1.3.1.13 aaf2.interpolation module

```

aaf2.interpolation.lerp(a, b, t)
aaf2.interpolation.cubic_bezier(p0, p1, p2, p3, t)
aaf2.interpolation.valid_root(v)
aaf2.interpolation.cube_root(x)
aaf2.interpolation.bezier_cubic_roots(pa, pb, pc, pd)
aaf2.interpolation.scale_handle(p0, p1, p2)
aaf2.interpolation.bezier_interpolate(p0, p1, p2, p3, x)
aaf2.interpolation.bezier_interpolate_old(p0, p1, p2, p3, t)
aaf2.interpolation.sign_no_zero(v)
aaf2.interpolation.calculate_tangent(p0, p1, p2, in_tangent=False)
aaf2.interpolation.cubic_interpolate(p0, p1, p2, p3, t)
aaf2.interpolation.mc_trapezoidal_integrate(value_at_func, a, b, n=5)
aaf2.interpolation.integrate_iter(value_at_func, start, end)

```

1.3.1.14 aaf2.metadict module

```

class aaf2.metadict.PropertyDef(*args, **kwargs)
    Bases: aaf2.core.AAFObject
        class_id = 0d010101-0202-0000-060e-2b3402060101
        property_name
        unique_key
        unique
        pid
        auid
        uuid
        optional
        typedef_id
        typedef
        store_format
class aaf2.metadict.ClassDef(*args, **kwargs)
    Bases: aaf2.core.AAFObject
        class_id = 0d010101-0201-0000-060e-2b3402060101
        auid
        uuid
        concrete
        class_name

```

```
unique_key
unique_key_pid
unique_key_size
isinstance(other)
name
classdef
parent_id
parent
propertydefs
lookup_propertydef(property_auid)
register_propertydef(name, property_auid, pid, typedef, optional, unique=False)
relatives()
all_propertydefs()
get_propertydef_from_pid(pid, default=None)
propertydef_by_pid
class aaf2.metadict.MetaDictionary(root)
    Bases: aaf2.core.AAFObject
    class_id = 0d010101-0225-0000-060e-2b3402060101
    register_typedef_model(typedef_model)
    register_extensions()
    register_classdef(name, class_auid, parent, concrete, propertydefs=None)
    register_external_typedef(ext_typedef)
    register_external_classdef(ext_classdef)
    lookup_class(class_id)
    lookup_typedef(t)
    lookup_classdef(t)
    classdef
    next_free_pid()
    read_properties()
```

1.3.1.15 aaf2.misc module

```
class aaf2.misc.TaggedValueHelper(property_vector)
    Bases: object
    get(key, default=None)
    items()
    append(value)
```

```
class aaf2.misc.TaggedValue (name=None, value=None, value_typedef=None)
    Bases: aaf2.core.AAFObject

    class_id = 0d010101-0101-3f00-060e-2b3402060101

    name
    value
    value_typedef
    encode_value (value, value_typedef=None)

class aaf2.misc.Parameter (*args, **kwargs)
    Bases: aaf2.core.AAFObject

    class_id = 0d010101-0101-3c00-060e-2b3402060101

    auid
    parameterdef
    name
    unique_property
    unique_key

class aaf2.misc.ConstantValue (parameterdef=None, value=None)
    Bases: aaf2.misc.Parameter

    class_id = 0d010101-0101-3d00-060e-2b3402060101

    typedef
    value_at (t)
    value

class aaf2.misc.VaryingValue (parameterdef=None, interpolationdef=None)
    Bases: aaf2.misc.Parameter

    class_id = 0d010101-0101-3e00-060e-2b3402060101

    interpolationdef
    interpolation
    pointlist
    typedef
    add_keyframe (time, value, edit_hint=None)
    value_at (t)
    nearest_index (t)
        binary search for index of point.time <= t

class aaf2.misc.ControlPoint (*args, **kwargs)
    Bases: aaf2.core.AAFObject

    class_id = 0d010101-0101-1900-060e-2b3402060101

    time
    value
    point_properties
```

base_frame

tangents

`aaf2.misc.generate_offset_map(speed_map, start=0, end=None)`

1.3.1.16 aaf2.mobid module

Excerpt from SMPTE ST 330 (Focus on Basic UMID):

5 General Specification

A unique material identifier (UMID) provides for the globally unique identification of any audiovisual material. This standard defines a dual approach through the specification of a basic UMID and an extended UMID. The basic UMID provides a globally unique identification for audiovisual material that comprises an integer number of one or more contiguous material units. The basic UMID has no embedded mechanism to distinguish between individual material units within a single instance of audiovisual material. The data in the basic UMID can be created through automatic generation.

The extended UMID comprises the basic UMID followed immediately by a source pack that provides a signature for material units. The source pack comprises a fixed length metadata pack of 32 bytes that provides sufficient metadata by which source ?when, where and who (or what)? information can be identified regardless of current ownership or status. The extended UMID also provides a mechanism to distinguish between individual material units within a single instance of audiovisual material.

The basic UMID is 32 bytes long and the extended UMID is 64 bytes long. Both UMID types use the key-length-value construct defined by SMPTE ST 336. The key is a 16-byte universal label truncated to 12 bytes. In the case of the basic UMID, the length field has a value of 13h and the value is formed by the combination of a material number and an instance number. In the case of the extended UMID, the length field has a value of 33h and the value is formed by the combination of the material and the instance numbers followed by the source pack. All components of the UMID have a defined byte order for consistent application in storage and streaming environments.

The components of the basic UMID are:

1. A 12-byte universal label,
2. A 1-byte length value,
3. A 3-byte instance number, and
4. A 16-byte material number.

The combination of the instance and material numbers can be treated as a dumb number. Note: The material number does not indicate the status of the material (such as copy number) or its representation (such as the compression kind). The material number can be identical in copies and in different representations of

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the material. The purpose of the instance number is to separately identify different representations or instances of audiovisual material. Thus, for example, a high-resolution picture and a thumbnail can both have the same material number because they both represent the same picture but, because they are different instances, they will have different instance numbers for the different representations. Guidance for the consistent application of new material numbers and instance numbers is given in SMPTE RP 205.

UMID universal label (SMPTELabel)

Byte No.	Description	Value (hex)	Meaning

1	Object identifier	06h	Universal label start
2	Label size	0Ah	12-byte Universal label
3	Designation: ISO	2Bh	ISO registered
4	Designation: SMPTE	34h	SMPTE registered
5	Registry category	01h	Dictionaries
6	Specific category	01h	Metadata dictionaries
7	Structure	01h	Dictionary standard
→ (SMPTE ST 335)			
8	Version number	05h	Version of the metadata
→ dictionary (defined in SMPTE RP 210)			
9	Class	01h	Identifiers and locators
10	Subclass	01h	Globally unique
→ identifiers			
11	Material type	XXh	See Section 6.1.2.1
12	Number creation method YYh		See Section 6.1.2.2

6.1.2.1 - Material type identification

Byte 11 of the UL shall define the material type being identified using one of the values defined in Table 2. The use of material types '01h', '02h', '03h' and '04h' shall be deprecated for use in implementations using this revised standard. These values are preserved only for compatibility with systems implemented using SMPTE ST 330:2000#

Table 2

Byte value	Meaning	
→ Examples and notes		

→ -----		
01h	picture material	
→ Deprecated		
02h	audio material	
→ Deprecated		
03h	data material	
→ Deprecated		
04h	other material	
→ Deprecated (originally not only picture, audio, or data material, but also a combination of material types)		

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05h	single picture component	e.g. ↪
↪Y component		
06h	Two or more picture components in a single container	e.g. ↪
↪interleaved Y, Cb and Cr components		
08h	single audio component	e.g. ↪
↪mono audio		
09h	two or more audio components in a single container	e.g. ↪
↪AES3 audio pair		
0Bh	single auxiliary (or data) component	e.g. ↪
↪sub-titles only		
0Ch	two or more auxiliary (or data) components in a single container	e.g. ↪
↪multiple sub-titles streams in different languages		
0Dh	mixed group of components in a single container	e.g. ↪
↪video & stereo audio pair		
0Fh	material type is not identified	

6.1.2.2 Number creation method identification

Byte 12 of the UL shall define the method by which the material and instance numbers [↪](#) are created. This byte is divided into top and bottom nibbles for the purpose of this definition. The top nibble shall occupy the 4 most significant bits (MSBs) of the byte and the [↪](#) value shall be used to define the method of material number creation. The values used by this nibble shall [↪](#) be limited to the range 0 to 7h so that byte 12 conforms to the ASN.1 BER short form coding rules used by SMPTE [↪](#) ST 298. The methods of material number generation shall be as defined in table 3 and the [↪](#) specification of the each method shall be as defined in Annex A. Note: New material number generation methods can be added by amendment or revision of [↪](#) this document. Each addition will provide the proposed value (within the range of values currently [↪](#) identified as "Reserved but not defined") for inclusion in Table 3 together with the supporting definition to be [↪](#) added to Annex A.

Table 3 - Identification of material number generation method::

Value (hex)	Method
0	No defined method
1	SMPTE method
2	UUID/UL method
3	Masked method
4	IEEE 1394 network method
5~7	Reserved but not defined

Notes from Pixar 10/30/17

Final note of discussion with Avid engineers how the top nibble in the 12th byte in the SMPTELabel should be set. (In the past we always had it set to 00, i.e. “no defined method”, we had some confusion about how to set it when using a uuid for the material)

Avid Engineer:

“The specification of number creation identification is very clear about using the 4 MSBs for the material number so I am pretty sure that the numbers in the sub-titles of Annex A (e.g. 02h) should not be interpreted literally as values of

byte 12. 20h is the correct value of the byte 12 for UL/UUID method/No defined method.

By the way, I don't see anything wrong with setting byte 12 to 00h (No defined method / No defined method)"

We at Pixar decided to set the byte to 20h, since it (even if already very minimal) completely eliminates the possibility to collide with any MOB ID created by our old MOB ID generation algorithm.

```
aaf2.mobid.UniqueMobID()
```

```
class aaf2.mobid.MobID (mobid=None, bytes_le=None, int=None)
```

Bases: object

bytes_le

static new()

Static method for generating unique MobIDs. Uses uuid.uuid4() for generation.

material

MobID material representation as a UUID

SMPTELabel

length

instanceHigh

instanceMid

instanceLow

Data1

Data2

Data3

Data4

from_dict(d)

Set MobID from a dict

to_dict()

MobID representation as dict

int

MobID representation as a int

urn

MobID Uniform Resource Name representation. https://en.wikipedia.org/wiki/Uniform_Resource_Name

1.3.1.17 aaf2.mobs module

```
class aaf2.mobs.Mob (name=None)
```

Bases: *aaf2.core.AAFObject*

Base Class for All Mob Objects

class_id = 0d010101-0101-3400-060e-2b3402060101

unique_key

name

mob_id

The unique Mob ID associated with this mob. Get Returns *aaf2.mobid.MobID* Object

usage

comments

slots

slot_at (*slot_id*)

create_timeline_slot (*edit_rate*, *slot_id=None*)

create_empty_sequence_slot (*edit_rate*, *slot_id=None*, *media_kind=None*)
Create an empty timeline slot and sets its segment to a new, empty *aaf2.components.Sequence* component. Timeline slots are for continuous, monotonically-changing media, like picture and sound.

create_picture_slot (*edit_rate=25*)
Create an empty timeline slot, with the 'picture' media kind, and sets its segment to a new, empty *aaf2.components.Sequence* component.

create_sound_slot (*edit_rate=25*)
Create an empty timeline slot, with the 'sound' media kind, and sets its segment to a new, empty *aaf2.components.Sequence* component.

create_source_clip (*slot_id=None*, *start=None*, *length=None*, *media_kind=None*)
Create a SourceClip of Mobs slot with *slot_id*. If no length given the default length will be the full length of slots segment minus *start*. Returns *aaf2.components.SourceClip* Object

dependant_mobs ()
Yields all mobs that this mob is dependant on in depth first order.

class *aaf2.mobs.CompositionMob* (*name=None*)
Bases: *aaf2.mobs.Mob*

class_id = 0d010101-0101-3500-060e-2b3402060101

class *aaf2.mobs.MasterMob* (*name=None*)
Bases: *aaf2.mobs.Mob*

class_id = 0d010101-0101-3600-060e-2b3402060101

import_dnxhd_essence (*path*, *edit_rate*, *tape=None*, *length=None*, *offline=False*)
Import video essence from raw DNxHD/DNxHR stream

import_audio_essence (*path*, *edit_rate=None*, *tape=None*, *length=None*, *offline=False*)
Import audio essence from wav file

class *aaf2.mobs.SourceMob* (*name=None*)
Bases: *aaf2.mobs.Mob*

class_id = 0d010101-0101-3700-060e-2b3402060101

descriptor

create_essence (*edit_rate=None*, *media_kind='picture'*, *slot_id=None*, *offline=False*)

create_empty_slot (*edit_rate=None*, *media_kind='picture'*, *slot_id=None*)

create_timecode_slot (*edit_rate*, *timecode_fps*, *drop_frame=False*, *length=None*)

create_tape_slots (*tape_name*, *edit_rate*, *timecode_fps*, *drop_frame=False*, *media_kind=None*, *length=None*)

import_rawvideo_essence (*path*, *edit_rate*, *width*, *height*, *pixel_layout*, *tape=None*)

import_dnxhd_essence (*path*, *edit_rate*, *tape=None*, *length=None*, *offline=False*)
Import video essence from raw DNxHD/DNxHR stream

```

import_audio_essence (path, edit_rate=None, tape=None, length=None, offline=False)
    Import audio essence from wav file

export_audio (path)

essence

```

1.3.1.18 aaf2.mobslots module

```

class aaf2.mobslots.MobSlot (slot_id=None, name=None, segment=None)
    Bases: aaf2.core.AAFObject

    class_id = 0d010101-0101-3800-060e-2b3402060101
    segment
    name
    datadef
    media_kind
    slot_id
    length

class aaf2.mobslots.EventMobSlot (slot_id=None, name=None, segment=None)
    Bases: aaf2.mobslots.MobSlot

    class_id = 0d010101-0101-3900-060e-2b3402060101
    edit_rate

class aaf2.mobslots.TimelineMobSlot (slot_id=None, name=None, segment=None, origin=None, edit_rate=None)
    Bases: aaf2.mobslots.MobSlot

    class_id = 0d010101-0101-3b00-060e-2b3402060101
    origin
    edit_rate
    length

class aaf2.mobslots.StaticMobSlot (slot_id=None, name=None, segment=None)
    Bases: aaf2.mobslots.MobSlot

    class_id = 0d010101-0101-3a00-060e-2b3402060101

```

1.3.1.19 aaf2.mxf module

```

aaf2.mxf.register_mxf_class (classobj)

class aaf2.mxf.MXFRef (hex=None, bytes_le=None, bytes_be=None, int=None)
    Bases: aaf2.auid.AUID

class aaf2.mxf.MXFRefArray
    Bases: list

aaf2.mxf.read_auid_be (f)

aaf2.mxf.read_strongref (f)

aaf2.mxf.decode_strong_ref_array (f)

```

```
aaf2.mxf.decode_utf16be(data)
aaf2.mxf.decode_auid(data)
aaf2.mxf.reverse_auid(data)
aaf2.mxf.decode_datadef(data)
aaf2.mxf.decode_strongref(data)
aaf2.mxf.decode_indirect_value(data)
aaf2.mxf.decode_rational(f)
aaf2.mxf.decode_video_line_map(f)
aaf2.mxf.decode_pixel_layout(f)
aaf2.mxf.decode_timestamp(f)
aaf2.mxf.decode_mob_id(data)
aaf2.mxf.ama_path(path)
class aaf2.mxf.MXFObject
    Bases: object

    create_aaf_instance()
    read_tag(tag, data)
    read_properties(f, length, local_tags)
    resolve_ref(key)
    iter_strong_refs(key)
class aaf2.mxf.MXFPreface
    Bases: aaf2.mxf.MXFObject

    class_id = 060e2b34-0253-0101-0d01-010101012f00
    read_tag(tag, data)
class aaf2.mxf.MXFContentStorage
    Bases: aaf2.mxf.MXFObject

    class_id = 060e2b34-0253-0101-0d01-010101011800
    read_tag(tag, data)
class aaf2.mxf.MXFPackage
    Bases: aaf2.mxf.MXFObject

    read_tag(tag, data)
    mob_id
    link()
class aaf2.mxf.MXFMaterialPackage
    Bases: aaf2.mxf.MXFPackage

    class_id = 060e2b34-0253-0101-0d01-010101013600
    create_aaf_instance()
class aaf2.mxf.MXFSourcePackage
    Bases: aaf2.mxf.MXFPackage
```

```
class_id = 060e2b34-0253-0101-0d01-010101013700
create_aaf_instance()

class aaf2.mxf.MXFTrack
    Bases: aaf2.mxf.MXFObject

    class_id = 060e2b34-0253-0101-0d01-010101013b00
    create_aaf_instance()
    read_tag(tag, data)
    link()

class aaf2.mxf.MXFStaticTrack
    Bases: aaf2.mxf.MXFTrack

    class_id = 060e2b34-0253-0101-0d01-010101013a00
    create_aaf_instance()

class aaf2.mxf.MXFEventTrack
    Bases: aaf2.mxf.MXFTrack

    class_id = 060e2b34-0253-0101-0d01-010101013900
    create_aaf_instance()

class aaf2.mxf.MXFComponent
    Bases: aaf2.mxf.MXFObject

    read_tag(tag, data)

class aaf2.mxf.MXFSequence
    Bases: aaf2.mxf.MXFComponent

    class_id = 060e2b34-0253-0101-0d01-010101010f00
    create_aaf_instance()
    link()

class aaf2.mxf.MXFSourceClip
    Bases: aaf2.mxf.MXFComponent

    class_id = 060e2b34-0253-0101-0d01-010101011100
    create_aaf_instance()
    link()

class aaf2.mxf.MXFTimecode
    Bases: aaf2.mxf.MXFComponent

    class_id = 060e2b34-0253-0101-0d01-010101011400
    create_aaf_instance()
    link()

class aaf2.mxf.MXFPulldown
    Bases: aaf2.mxf.MXFComponent

    class_id = 060e2b34-0253-0101-0d01-010101010c00
    create_aaf_instance()
    link()
```

```
class aaf2.mxf.MXFFiller
    Bases: aaf2.mxf.MXFComponent

    class_id = 060e2b34-0253-0101-0d01-010101010900

    create_aaf_instance()

    link()

class aaf2.mxf.MXFScopeReference
    Bases: aaf2.mxf.MXFComponent

    class_id = 060e2b34-0253-0101-0d01-010101010d00

    create_aaf_instance()

    link()

class aaf2.mxf.MXFEssenceGroup
    Bases: aaf2.mxf.MXFComponent

    class_id = 060e2b34-0253-0101-0d01-010101010500

    create_aaf_instance()

    link()

class aaf2.mxf.MXFDescriptor
    Bases: aaf2.mxf.MXFObject

    read_tag(tag, data)

class aaf2.mxf.MXFMultipleDescriptor
    Bases: aaf2.mxf.MXFDescriptor

    class_id = 060e2b34-0253-0101-0d01-010101014400

    create_aaf_instance()

    link()

class aaf2.mxf.MXFCDCIDDescriptor
    Bases: aaf2.mxf.MXFDescriptor

    class_id = 060e2b34-0253-0101-0d01-010101012800

    create_aaf_instance()

    link()

class aaf2.mxf.MXFRGBADescriptor
    Bases: aaf2.mxf.MXFDescriptor

    class_id = 060e2b34-0253-0101-0d01-010101012900

    create_aaf_instance()

    link()

class aaf2.mxf.MXFANCDDataDescriptor
    Bases: aaf2.mxf.MXFDescriptor

    class_id = 060e2b34-0253-0101-0d01-010101015c00

    create_aaf_instance()

    link()
```

```
class aaf2.mxf.MXFMPEG2VideoDescriptor
    Bases: aaf2.mxf.MXFCDCIDescriptor

    class_id = 060e2b34-0253-0101-0d01-010101015100

    link()

class aaf2.mxf.MXFPCMDescriptor
    Bases: aaf2.mxf.MXFDescriptor

    class_id = 060e2b34-0253-0101-0d01-010101014800

    create_aaf_instance()

    link()

class aaf2.mxf.MXFAES3AudioDescriptor
    Bases: aaf2.mxf.MXFPCMDescriptor

    class_id = 060e2b34-0253-0101-0d01-010101014700

class aaf2.mxf.MXFSoundDescriptor
    Bases: aaf2.mxf.MXFPCMDescriptor

    class_id = 060e2b34-0253-0101-0d01-010101014200

class aaf2.mxf.MXFImportDescriptor
    Bases: aaf2.mxf.MXFDescriptor

    class_id = 060e2b34-0253-0101-0d01-010101014a00

    create_aaf_instance()

    link()

class aaf2.mxf.MXFTapeDescriptor
    Bases: aaf2.mxf.MXFDescriptor

    class_id = 060e2b34-0253-0101-0d01-010101012e00

    create_aaf_instance()

    link()

class aaf2.mxf.MXFLocator
    Bases: aaf2.mxf.MXFObject

    read_tag(tag, data)

class aaf2.mxf.MXFNetworkLocator
    Bases: aaf2.mxf.MXFLocator

    class_id = 060e2b34-0253-0101-0d01-010101013200

    create_aaf_instance()

    link()

class aaf2.mxf.MXFEssenceData
    Bases: aaf2.mxf.MXFObject

    class_id = 060e2b34-0253-0101-0d01-010101012300

    read_tag(tag, data)

class aaf2.mxf.MXFTaggedValue
    Bases: aaf2.mxf.MXFObject
```

```
class_id = 060e2b34-0253-0101-0d01-010101013f00

create_aaf_instance()

read_tag(tag, data)

link()

aaf2.mxf.ber_length(f)

aaf2.mxf.iter_kl(f)

aaf2.mxf.iter_tags(f, length)

aaf2.mxf.auid_to_str_list(v, sep=',', prefix='')

class aaf2.mxf.MXFFile(path)
    Bases: object

    resolve(ref)

    content

    packages()

    material_packages()

    link(f)

    round_to_kag(pos, kag_size)

    read_header(f, length)

    read_primer(f, length)

    read_object(f, key, length)

    dump_flat()

    dump(obj=None, space='')

    operation_pattern
```

1.3.1.20 aaf2.properties module

```
aaf2.properties.writeonly(func)

class aaf2.properties.Property(parent, pid, format, version=32)
    Bases: object

    pid

    format

    version

    data

    parent

    format_name()

    attached

    writeable

    decode()

    mark_modified()
```

```
propertydef
unique
name
typedef
copy (parent, pid, cache=None)
value
add_pid_entry ()
remove_pid_entry ()

class aaf2.properties.StreamProperty (parent, pid, format, version=32)
    Bases: aaf2.properties.Property
    stream_name
    dir
    copy (parent, pid, cache)
    decode ()
    encode (data)
    setup_stream ()
    open (mode='r')
    detach ()
    attach ()
    value

class aaf2.properties.StrongRefProperty (parent, pid, format, version=32)
    Bases: aaf2.properties.Property
    ref
    objectref
    object
    copy (parent, pid, cache)
    decode ()
    encode (data)
    value
    detach ()
    attach ()

class aaf2.properties.StrongRefVectorProperty (parent, pid, format, version=32)
    Bases: aaf2.properties.Property
    references
    next_free_key
    last_free_key
    objects
```

```
copy (parent, pid, cache)
index_name
encode (data)
decode ()
read_index ()
write_index (*args, **kwargs)
ref_classdef
index_ref_name (index)
get (index, default=None)
clear (*args, **kwargs)
pop (*args, **kwargs)
insert (*args, **kwargs)
extend (*args, **kwargs)
append (value)
value
detach ()
attach ()

class aaf2.properties.StrongRefSetProperty (parent, pid, format, version=32)
    Bases: aaf2.properties.Property
    references
    index_name
    next_free_key
    last_free_key
    key_pid
    key_size
    objects
    copy (parent, pid, cache)
    encode (data)
    decode ()
    read_index ()
    write_index (*args, **kwargs)
    index_ref_name (key)
    read_object (key)
    items ()
    values ()
    get (key, default=None)
```

```
    swap_unique_key (*args, **kwargs)
    extend (*args, **kwargs)
    append (value)
    clear (*args, **kwargs)
    pop (*args, **kwargs)
    value
    detach ()
    attach ()

aaf2.properties.resolve_weakref (p, ref)

class aaf2.properties.WeakRefProperty (parent, pid, format, version=32)
    Bases: aaf2.properties.Property
    weakref_index
    key_pid
    key_size
    ref
    copy (parent, pid, cache)
    decode ()
    encode ()
    ref_classdef
    pid_path
    value

class aaf2.properties.WeakRefArrayProperty (parent, pid, format, version=32)
    Bases: aaf2.properties.Property
    references
    index_name
    weakref_index
    key_pid
    key_size
    copy (parent, pid, cache)
    encode (data)
    decode ()
    read_index ()
    write_index (*args, **kwargs)
    ref_classdef
    pid_path
    get (key, default=None)
    items ()
```

```
extend (*args, **kwargs)

append (value)

clear (*args, **kwargs)

value

class aaf2.properties.WeakRefVectorProperty (parent, pid, format, version=32)
    Bases: aaf2.properties.WeakRefArrayProperty

class aaf2.properties.WeakRefSetProperty (parent, pid, format, version=32)
    Bases: aaf2.properties.WeakRefArrayProperty

class aaf2.properties.WeakRefPropertyId (parent, pid, format, version=32)
    Bases: aaf2.properties.WeakRefProperty

class aaf2.properties.UniqueIdProperty (parent, pid, format, version=32)
    Bases: aaf2.properties.Property

class aaf2.properties.OpaqueStreamProperty (parent, pid, format, version=32)
    Bases: aaf2.properties.Property

aaf2.properties.add_string_property (parent, pid, value)

aaf2.properties.add_bool_property (parent, pid, value)

aaf2.properties.add_u32le_property (parent, pid, value)

aaf2.properties.add_u16le_property (parent, pid, value)

aaf2.properties.add_u8_property (parent, pid, value)

aaf2.properties.add_auid_property (parent, pid, value)

aaf2.properties.add_auid_array_property (parent, pid, values)

aaf2.properties.add_utf16_array_property (parent, pid, values)

aaf2.properties.add_s64le_array_property (parent, pid, values)

aaf2.properties.add_weakref_property (parent, pid, pid_path, key_pid, value)

aaf2.properties.add_classdef_weakref_property (parent, pid, value)

aaf2.properties.add_typedef_weakref_property (parent, pid, value)

aaf2.properties.add_strongref_set_property (parent, pid, property_name, unique_pid,
                                          key_size=16)

aaf2.properties.add2set (self, pid, key, value)
    low level add to StrongRefSetProperty

aaf2.properties.add_typedef_weakref_vector_property (parent, pid, property_name, values)
```

1.3.1.21 aaf2.rational module

```
class aaf2.rational.AAFRational
    Bases: fractions.Fraction
```

Subclass of `fractions.Fraction` from the standard library. Behaves exactly the same, except doesn't round to the Greatest Common Divisor at the end.

1.3.1.22 aaf2.types module

```
class aaf2.types.TypeDef(*args, **kwargs)
    Bases: aaf2.core.AAFObject

    class_id = 0d010101-0203-0000-060e-2b3402060101

    copy (root=None)

    unique_key

    auid

    uuid

    type_name

    store_format

class aaf2.types.TypeDefInt(*args, **kwargs)
    Bases: aaf2.types.TypeDef

    class_id = 0d010101-0204-0000-060e-2b3402060101

    copy (root=None)

    signed

    size

    byte_size

    pack_format (elements=1)

    decode (data)

    encode (value)

class aaf2.types.TypeDefStrongRef(*args, **kwargs)
    Bases: aaf2.types.TypeDef

    class_id = 0d010101-0205-0000-060e-2b3402060101

    copy (root=None)

    store_format

    ref_classdef

class aaf2.types.TypeDefWeakRef(*args, **kwargs)
    Bases: aaf2.types.TypeDef

    class_id = 0d010101-0206-0000-060e-2b3402060101

    copy (root=None)

    store_format

    ref_classdef

    path

    pid_path

    target_set_path

    propertydef_path
```

```
class aaf2.types.TypeDefEnum(*args, **kwargs)
    Bases: aaf2.types.TypeDef

    class_id = 0d010101-0207-0000-060e-2b3402060101

    copy (root=None)

    byte_size

    elements

    element_typedef

    register_element (element_name, element_value)

    decode (data)

    encode (data)

aaf2.types.iter_utf16_array (data)

class aaf2.types.TypeDefFixedArray(*args, **kwargs)
    Bases: aaf2.types.TypeDef

    class_id = 0d010101-0208-0000-060e-2b3402060101

    copy (root=None)

    element_typedef

    size

    byte_size

    decode (data)

    encode (data)

class aaf2.types.TypeDefVarArray(*args, **kwargs)
    Bases: aaf2.types.TypeDef

    class_id = 0d010101-0209-0000-060e-2b3402060101

    copy (root=None)

    store_format

    element_typedef

    ref_classdef

    decode (data)

    encode (value)

class aaf2.types.TypeDefSet(*args, **kwargs)
    Bases: aaf2.types.TypeDef

    class_id = 0d010101-020a-0000-060e-2b3402060101

    copy (root=None)

    element_typedef

    ref_classdef

    store_format

    decode (data)
```

```

    encode (data)
class aaf2.types.TypeDefString (*args, **kwargs)
    Bases: aaf2.types.TypeDef
    class_id = 0d010101-020b-0000-060e-2b3402060101
    copy (root=None)
    element_typedef
    decode (data)
    encode (data)
class aaf2.types.TypeDefStream (*args, **kwargs)
    Bases: aaf2.types.TypeDef
    class_id = 0d010101-020c-0000-060e-2b3402060101
    store_format
class aaf2.types.TypeDefRecord (*args, **kwargs)
    Bases: aaf2.types.TypeDef
    class_id = 0d010101-020d-0000-060e-2b3402060101
    copy (root=None)
    member_names
    member_types
    fields
    byte_size
    decode (data)
    encode (data)
class aaf2.types.TypeDefRename (*args, **kwargs)
    Bases: aaf2.types.TypeDef
    class_id = 0d010101-020e-0000-060e-2b3402060101
    copy (root=None)
    renamed_typedef
    decode (data)
    encode (data)
aaf2.types.iter_auid_array (data)
class aaf2.types.TypeDefExtEnum (*args, **kwargs)
    Bases: aaf2.types.TypeDef
    class_id = 0d010101-0220-0000-060e-2b3402060101
    copy (root=None)
    register_element (element_name, element_auid)
    elements
    decode (data)
    encode (data)

```

```
class aaf2.types.TypeDefIndirect (*args, **kwargs)
    Bases: aaf2.types.TypeDef

    class_id = 0d010101-0221-0000-060e-2b3402060101

    decode_typedef (data)

    decode (data)

    encode (data, data_typedef=None)

class aaf2.types.TypeDefOpaque (*args, **kwargs)
    Bases: aaf2.types.TypeDefIndirect

    class_id = 0d010101-0222-0000-060e-2b3402060101

class aaf2.types.TypeDefCharacter (*args, **kwargs)
    Bases: aaf2.types.TypeDef

    class_id = 0d010101-0223-0000-060e-2b3402060101

class aaf2.types.TypeDefGenericCharacter (*args, **kwargs)
    Bases: aaf2.types.TypeDef

    class_id = 0e040101-0000-0000-060e-2b3402060101

    copy (root=None)

    size
```

1.3.1.23 aaf2.utils module

```
aaf2.utils.read_u8 (f)
aaf2.utils.write_u8 (f, value)
aaf2.utils.read_u16le (f)
aaf2.utils.read_u16be (f)
aaf2.utils.write_u16le (f, value)
aaf2.utils.read_u32le (f)
aaf2.utils.read_u32be (f)
aaf2.utils.read_s32be (f)
aaf2.utils.write_u32le (f, value)
aaf2.utils.read_u64le (f)
aaf2.utils.read_u64be (f)
aaf2.utils.read_s64be (f)
aaf2.utils.write_u64le (f, value)
aaf2.utils.decode_sid (sid)
aaf2.utils.read_sid (f)
aaf2.utils.encode_sid (sid)
aaf2.utils.write_sid (f, value)
aaf2.utils.read_filetime (f)
```

```
aaf2.utils.decode_utf16le(data)
aaf2.utils.encode_utf16le(data)
aaf2.utils.encode_u16le(value)
aaf2.utils.encode_u32le(value)
aaf2.utils.encode_u8(value)
aaf2.utils.encode_utf16_array(data)
aaf2.utils.encode_auid_array(values)
aaf2.utils.str2auid(value)
aaf2.utils.encode_s64le(value)
aaf2.utils.write_filetime(f, value)
aaf2.utils.unpack_u16le_from(buffer, offset)
aaf2.utils.unpack_u32le_from(buffer, offset)
aaf2.utils.unpack_u64le_from(buffer, offset)
aaf2.utils.int_from_bytes(data, byte_order='big')
aaf2.utils.bytes_from_int(num, length, byte_order='big')
aaf2.utils.squeeze_name(name, size)
aaf2.utils.mangle_name(name, pid, size)
aaf2.utils.safe_print(*args)
aaf2.utils.register_class(classobj)
aaf2.utils.rescale(value, current_rate, new_rate)
```

1.3.1.24 aaf2.video module

```
aaf2.video.dnx_frame_size(cid, width=None, height=None)
aaf2.video.valid_dnx_prefix(prefix)
aaf2.video.read_dnx_frame_header(dnx_header)
aaf2.video.iter_dnx_stream(f)
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