



AAF For Developers

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SDK

- Available via Source Forge
- <http://www.sourceforge.net>
- Create a Source Forge account and read the CVS HowTo available on Source Forge.
- Download command using common command line CVS client:

```
cvsv -z3 \
```

```
-
```

```
d:pserver:anonymous@cvs.aaf.sourceforge.net:/cvsroot/aaf\
```

```
co AAF
```



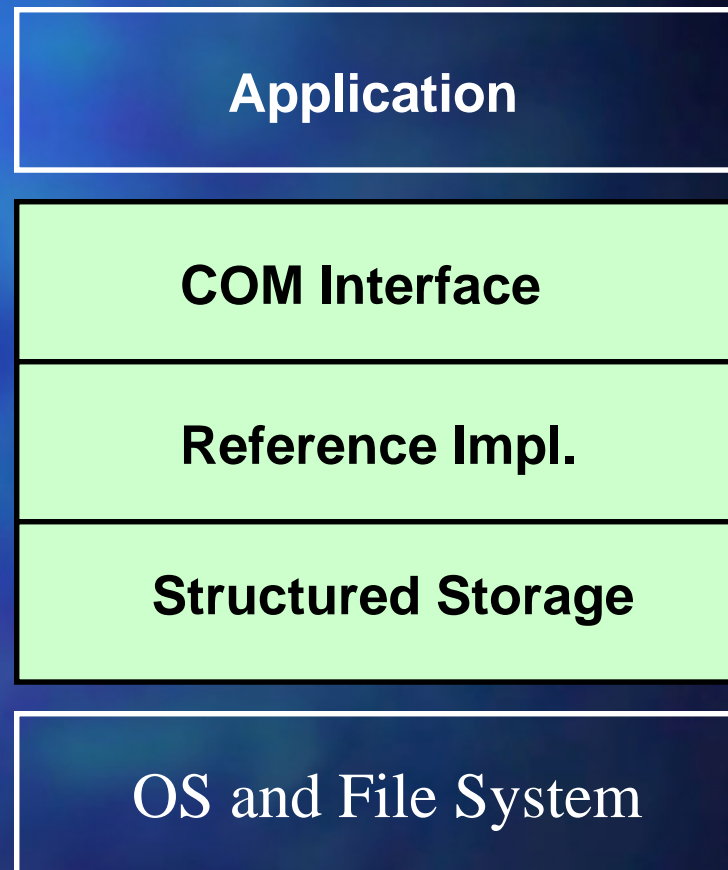
SDK

- Follow the build instructions in [AAF\doc\AAFProjectFAQ.html](#).
- Look for resulting binaries and header files:
 - AAF/AAFMacSDK
 - AAF/AAFMipsIrixSDK
 - AAF/AAFi686LinuxSDK
 - AAF/AAFWinSDK



SDK

- **COM interface used to access and manipulate stored objects.**
- **Reference implementation implements the AAF object model.**
- **Structured Storage provides a persistent object store.**
- **Application developers only need to worry about the COM interface.**





SDK

- **Wait! Aren't COM and Structured Storage only available on Microsoft platforms?**
- **A minimal COM implementation is included to support non Microsoft platforms.**
- **Structured Storage ports exist for Mac, Irix, and Linux.**



SDK - First Program

- Short program to create a new AAF file that contains a single named MasterMob.
- Mobs are Metadata Objects that describe essence.
- Master Mobs store metadata required to locate essence data. i.e. a tape or file location, or embedded essence.



SDK - First Program

■ Load the AAF Library with `AAFLoad()`

```
#include <AAF.h>
#include <AAFStoredObjectIDs.h>

int main( int argc, char** argv )
{
    AAFLoad( "./libcom-api.so" );
}
```



SDK - First Program

■ Create a new file.

```
aafProductIdentification_t ident =  
    { L"AAF Association", // Company Name  
      L"First File",      // Product Name,  
      L"2.71828182818",  // Product Version  
      {0x89aa595e, 0x51ec, 0x8ce8,  
        {0x8c, 0xe8, 0x37, 0x81, 0x8d, 0xef, 0x78, 0xf3}} // Product UID  
    };  
  
IAAFFile* file;  
AAFFileOpenNewModify( L"./my_first_aaf_file.aaf", 0, &ident, &file );
```




SDK - First Program

- Get the file header, and dictionary.

```
IAAFHeader* header;
```

```
file->GetHeader( &header );
```

```
IAAFDictionary* dictionary;
```

```
header->GetDictionary( &dictionary );
```



SDK - First Program

- Use the dictionary to create a MasterMob.

```
IAAFMasterMob* masterMob;
```

```
dictionary->CreateInstance(  
    AUID_AAFMasterMob, // The SMPTE object ID  
    IID_IAAFMasterMob, // The COM interface ID,  
    reinterpret_cast<IUnknown**>(&masterMob) );
```

```
masterMob->Initialize();
```



SDK - First Program

- Name the Mob. Note use of QueryInterface.

```
IAAFMob* mob;
```

```
masterMob->QueryInterface(  
    IID_IAAFMob,  
    reinterpret_cast<void**>(&mob) );
```

```
mob->SetName( L"First Mob" );
```



SDK - First Program

- To save the mob, it is added to the header, then the file is then saved and closed.

```
header->AddMob( mob );
```

```
file->Save();
```

```
file->Close();
```



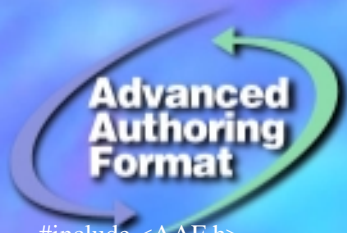
SDK - First Program

- Finally, unload the COM module.

```
AAFUnload();
```

```
return 0;
```

```
}
```



SDK - First Program

```
#include <AAF.h>
#include <AAFStoredObjectIDs.h>
#include <unistd.h>

int main( int argc, char** argv )
{
    // Load the default COM implementation library.
    AAFLoad( "./libcom-api.so" );

    // We will need a product identification structure.
    // Need an UID? Try Microsoft's UUIDGEN tool.
    aafProductIdentification_t ident =
    { L"AAF Association", L"First Mob", L"2.71828182818",
    { 0x89aa595e, 0x51ec, 0x8ce8,
    { 0x8c, 0xe8, 0x37, 0x81, 0x8d, 0xef, 0x78, 0xf3 }},
    0, 0};

    // Create a new file.
    unlink( "./my_first_aaf_file.aaf" );
    IAAFFile* file;
    AAFFileOpenNewModify( L"./my_first_aaf_file.aaf", 0, &ident, &file );

    // We will need the header.
    IAAFHeader* header;
    file->GetHeader( &header );

    // The dictionary is required to create a new object
    IAAFDictionary* dictionary;
    header->GetDictionary( &dictionary );
```

```
// Now, use the dictionary to create a MasterMob.
IAAFMasterMob* masterMob;
dictionary->CreateInstance(
    AUID_AAFMasterMob,
    IID_IAAFMasterMob,
    reinterpret_cast<IUnknown**>(&masterMob) );
masterMob->Initialize();

// Name this mob "My First Mob"
IAAFMob* mob;
masterMob->QueryInterface( IID_IAAFMob,
    reinterpret_cast<void**>(&mob) );
mob->SetName( L"First Mob" );

// Add mob to the file (via the header)
header->AddMob( mob );

// Save and close the file.
file->Save();
file->Close();

// Unload the COM module.
AAFUnload();

return 0;
}
```

```
g++ firstAAF.cpp -ldl -rdynamic -I ../AAF/AAFi686LinuxSDK/g++/include -Xlinker -rpath -Xlinker \
../AAF/AAFi686LinuxSDK/g++/Examples/debug\ -L../aaf/cvs/AAF/AAFi686LinuxSDK/g++/lib/debug -laaflib -laafiid -o firstAAF
```



SDK - First Program

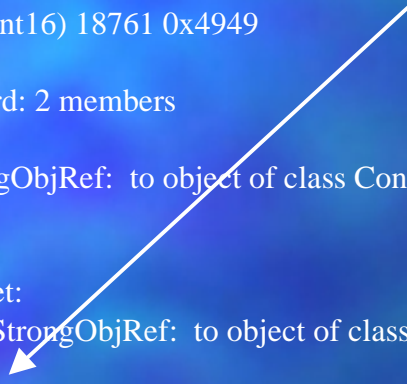
- **This program does not:**
 - Have proper error handling!
 - Correctly release the COM interfaces!
 - Do anything useful!



SDK - First Program

Level	Desc.	Detail
1	Object	Header
2	Prop	ByteOrder
3	Value	IAAFTypeDefInt: (Int16) 18761 0x4949
2	Prop	LastModified
3	Value	IAAFTypeDefRecord: 2 members
2	Prop	Content
3	Value	IAAFTypeDefStrongObjRef: to object of class ContentStorage
4	Object	ContentStorage
5	Prop	Mobs
6	Value	IAAFTypeDefSet:
7	Value	IAAFTypeDefStrongObjRef: to object of class MasterMob
8	Object	MasterMob
9	Prop	MobID
10	Value	IAAFTypeDefRecord: 6 members
9	Prop	Name
10	Value	IAAFTypeDefString: First Mob
9	Prop	Slots
10	Value	IAAFTypeDefVariableArray: 0 elements of type IAAFTypeDefStrongObjRef
9	Prop	LastModified
10	Value	IAAFTypeDefRecord: 2 members
9	Prop	CreationTime
10	Value	IAAFTypeDefRecord: 2 members
2	Prop	Dictionary
2	Prop	Version
2	Prop	IdentificationList

Here is our "First Mob"





SDK - New Examples

- **New AAF Example code implements complex examples.**
 - Metadata example
 - Essence example
 - Composition example
 - Others to follow



SDK - New Examples

- **Examples built on library of reusable C++ classes.**
- **One example builds on the result of the previous example.**
- **Demonstrates evolution of object structure as file content becomes increasingly complex.**



SDK - New Examples

■ Object Glossary:

- **MasterMob** locates essence data.
- **SourceMob** describes essence data.
- **CompostionMob** describes a compostion, and refers to MasterMobs.
- **SourceClip** represents content data, and refers to a SourceMob.
- **TimelineMobSlot** describes time-varying essence. It represents one "track".



SDK - New Examples

■ Object Glossary (continued)

- **Sequence** is a list of Segments and Transitions used to describe one track of a Composition
- **Segment** describes content in a composition.
- **Transition** describes effects in a composition.
- **WAVEDescriptor** describes audio essence.
- **CDCIDescriptor** describes video essence.
- **EssenceData** stores essence bits.



SDK - New Examples

- **Create empty file:**

```
axExample -file ax.aaf
```

Level	Desc.	Detail
1	Object	Header
4	Object	ContentStorage

- **Dump objects only.**

- **Only Header and ContentStorage objects are present in the file.**

- **Dictionary also exists, but is not shown.**



SDK - New Examples

- Add meta data

axExample -file ax.aaf -metadata

- Four MasterMobs

- Each has two Editor comments (TaggedValue).

- Each has two KLVDData objects.

Level	Desc.	Detail
1	Object	Header
4	Object	ContentStorage
8	Object	MasterMob
12	Object	TaggedValue
12	Object	TaggedValue
12	Object	KLVDData
12	Object	KLVDData
8	Object	MasterMob
12	Object	TaggedValue
12	Object	TaggedValue
12	Object	KLVDData
12	Object	KLVDData
8	Object	MasterMob
12	Object	TaggedValue
12	Object	TaggedValue
12	Object	KLVDData
12	Object	KLVDData
8	Object	MasterMob
12	Object	TaggedValue
12	Object	TaggedValue
12	Object	KLVDData
12	Object	KLVDData



SDK - New Examples

- The essence examples adds audio and video essence:

```
axExample -file ax.aaf -metadata -essence
```

- Note the appearance of TimelineMobSlot, SourceClip, EssenceDescriptor, and SourceMob objects in the dump.
- These objects are created by a call to IAAFMasterMob::CreateEssence()



SDK - New Examples

Level	Desc.	Detail
1	Object	Header
4	Object	ContentStorage
8	Object	MasterMob
12	Object	TimelineMobSlot
15	Object	SourceClip
12	Object	TaggedValue
12	Object	TaggedValue
12	Object	KLVDData
12	Object	KLVDData
		.
		.
		.
8	Object	SourceMob
12	Object	TimelineMobSlot
15	Object	SourceClip
11	Object	WAVEDescriptor
8	Object	SourceMob
12	Object	TimelineMobSlot
15	Object	SourceClip
11	Object	WAVEDescriptor
8	Object	SourceMob
8	Object	EssenceData
8	Object	EssenceData
8	Object	EssenceData
8	Object	EssenceData



SDK - New Examples

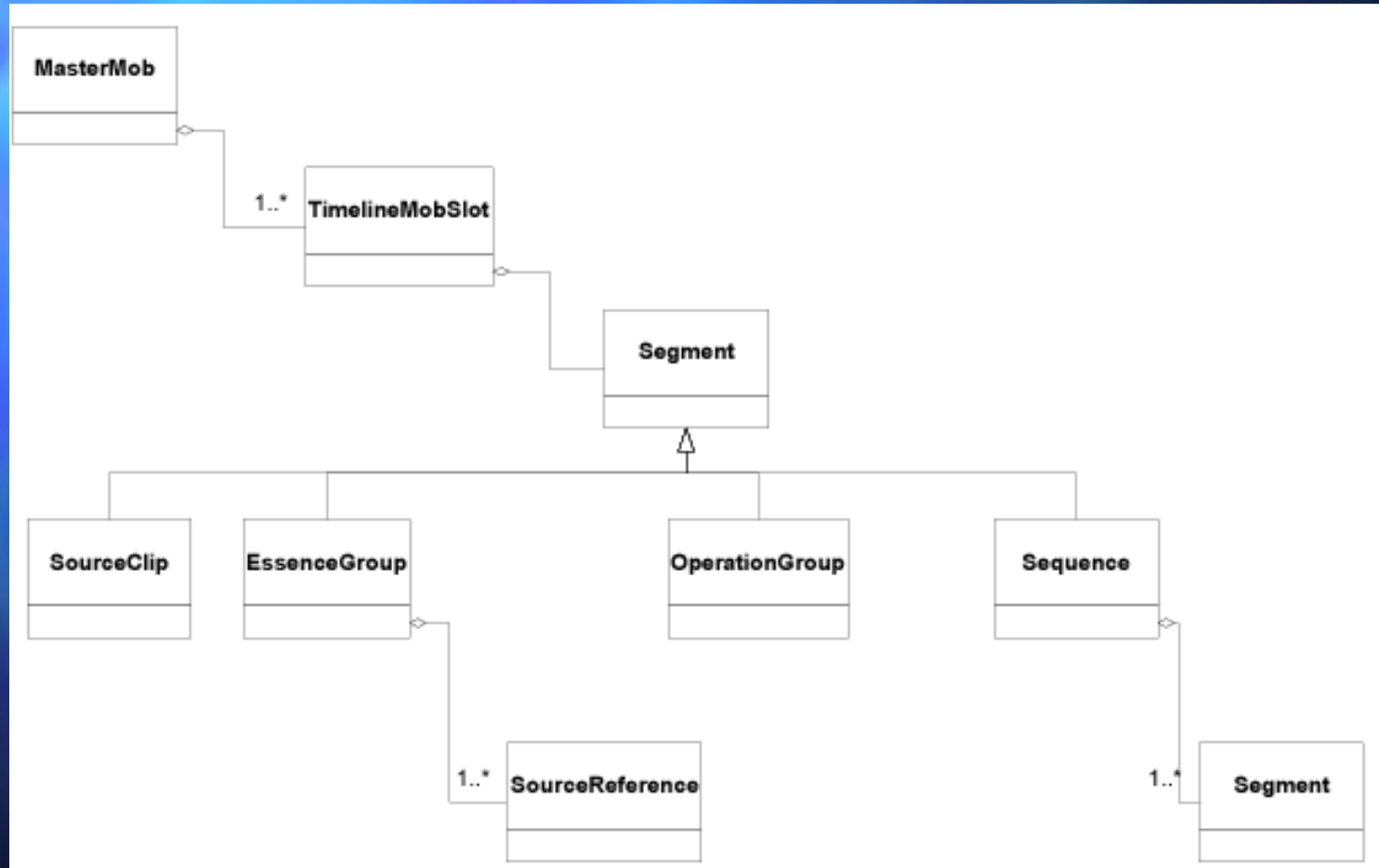
- The composition example creates an audio/video sequence with a transition. The composition references the existing MasterMobs.

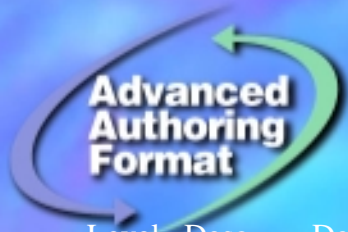
```
axExample -file ax.aaf -metadata -essence -composition
```

- Note the appearance of **CompositionMob**, **Sequence**, **Transition**, and **OperationGroup** objects in the file.



AAF UML Diagram





SDK - New Examples

Level	Desc.	Detail			
1	Object	Header			
4	Object	ContentStorage			
8	Object	MasterMob			
12	Object	TimelineMobSlot	8	Object	CompositionMob
15	Object	SourceClip	12	Object	TimelineMobSlot
12	Object	TaggedValue	15	Object	Sequence
12	Object	TaggedValue	19	Object	SourceClip
12	Object	KLVDData	19	Object	Transition
12	Object	KLVDData	22	Object	OperationGroup
		.	19	Object	SourceClip
		.	19	Object	Transition
		.	22	Object	OperationGroup
			19	Object	SourceClip
8	Object	SourceMob	8	Object	EssenceData
12	Object	TimelineMobSlot	8	Object	EssenceData
15	Object	SourceClip	8	Object	EssenceData
11	Object	WAVEDescriptor	8	Object	EssenceData
		.			
		.			
		.			
8	Object	SourceMob			
12	Object	TimelineMobSlot			
15	Object	SourceClip			
11	Object	CDCIDescriptor			