
**Information technology — MPEG
systems technologies —**

**Part 7:
Common encryption in ISO base media
file format files**

**AMENDMENT 1: AES-CBC-128 and key
rotation**

Technologies de l'information — Technologies des systèmes MPEG —

*Partie 7: Cryptage commun des fichiers au format de fichier de médias
de la base ISO*

AMENDEMENT 1: AES-CBC-128 et rotation des clés



Reference number
ISO/IEC 23001-7:2016/Amd.1:2019(E)

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Published in Switzerland

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AMENDMENT 1: AES-CBC-128 and key rotation

Clause 2

Add the following new normative references:

ISO/IEC 23008-2, Information technology — *High efficiency coding and media delivery in heterogeneous environments — Part 2: High efficiency video coding*

ISO/IEC 23008-12, Information technology — *High efficiency coding and media delivery in heterogeneous environments — Part 12: Image File Format (HEIF)*

3.1

Insert a new 3.1.8 and renumber current 3.1.8 as 3.1.9:

3.1.8 sample

media sample when the protection applies to media tracks, or payload of an item when the protection applies to items

Note 1 to entry: Media sample as defined in 14496-12.

Note 2 to entry: Payload of an item as defined in 14496-12.

4.2

Add the following item to the list:

- e) 'sve1' – AES-CTR content sensitive encryption, as defined in [Annex A](#).

Clause 6

In paragraph 4, replace:

```
{  
  
    unsigned int(8)      reserved = 0;  
  
    unsigned int(4)      crypt_byte_block;  
  
    unsigned int(4)      skip_byte_block;  
  
    unsigned int(8)      isProtected;  
  
    unsigned int(8)      Per_Sample_IV_Size;  
  
    unsigned int(8)[16]  KID;  
  
    if (Per_Sample_IV_Size == 0) {  
  
        unsigned int(8)  constant_IV_size;  
  
        unsigned int(8)[constant_IV_size] constant_IV;  
  
    }  
  
}
```

with

```
{  
  
    unsigned int(1)      multi_key_flag;  
  
    unsigned int(7)      reserved = 0;  
  
    unsigned int(4)      crypt_byte_block;  
  
    unsigned int(4)      skip_byte_block;  
  
    unsigned int(8)      isProtected;  
  
    if (multi_key_flag == 1) {  
  
        unsigned int(16)  key_count;  
  
    } else {  
  
        key_count = 1;  
  
    }  
  
    for (i=1; i <= key_count; i++) {  
  
        unsigned int(8)      Per_Sample_IV_Size;  
  
        unsigned int(8)[16]  KID;  
  
        if (Per_Sample_IV_Size == 0) {  
  
            unsigned int(8)  constant_IV_size;  
  
            unsigned int(8)[constant_IV_size] constant_IV;  
  
        }  
  
    }  
  
}
```

```

    }
}
}

```

Clause 6

Add a new item to the list in paragraph 5 (insert before semantics of `isProtected`):

- `multi_key_flag` indicates that the multiple key version of the sample group description is used. If this flag is set, multiple keys will be described for this sample group description entry; otherwise, a single key is described for this sample group description entry.

Add a new item to the list in paragraph 5 (insert after semantics of `isProtected`):

- `key_count` indicates the number of keys that may apply to a sample associated to this sample group description entry. It is not required that a sample associated with this sample group description entry uses all the keys described.

7.1

Replace the sample auxiliary information in paragraph 3 with:

```

aligned(8) class CencSampleAuxiliaryDataFormat
{
    if (aux_info_type_parameter==0) {
        unsigned int(Per_Sample_IV_Size*8) InitializationVector;
        if (sample_info_size > Per_Sample_IV_Size ) {
            unsigned int(16) subsample_count;
            {
                unsigned int(16) BytesOfClearData;
                unsigned int(32) BytesOfProtectedData;
            } [subsample_count ]
        }
    }
    else if (aux_info_type_parameter == 1) {
        unsigned int(16) multi_IV_count;
        for (i=1; i <= multi_IV_count; i++) {
            unsigned int(8) multi_subindex_IV;
            unsigned int(Per_Sample_IV_Size*8) IV;
        }
        unsigned int(32) subsample_count;
    }
}

```

```

        unsigned int(16) multi_subindex;

        unsigned int(16) BytesOfClearData;

        unsigned int(32) BytesOfProtectedData;

    } [subsample_count]

}

```

Following the sample auxiliary information, add the following at the end of the 'where' list (after semantics of BytesOfProtectedData):

`multi_IV_count` indicates the number of entries in the initialization vector loop;

`multi_subindex_IV` indicates the index of the associated key entry, where value one is the first entry, in the associated list; if this data is read for the processing of a track sample, the associated list is the 'seig' sample group description entry associated with this sample; otherwise (this data is read for the processing of an item), the associated list is the list of key definitions in the 'ienc' item property of this item. The associated key entry shall have a `Per_Sample_IV_Size` different from 0, i.e. key entries using constant IV shall not be present in this loop. If this data is read for the processing of a track sample and `aux_info_type_parameter` is set to 1, the associated 'seig' sample group description entry shall have the `multi_key_flag` set to 1;

`IV` indicates the initialization vector to be used for the first block of protected data for the associated key entry;

`multi_subindex` indicates the index of the associated key entry, where value one is the first entry, in the associated list (see `multi_subindex_IV`) for the following run of encrypted data.

7.2.2

Replace the content of 7.2.2 with the following:

```

aligned(8) class SampleEncryptionBox extends FullBox('senc', version, flags)
{
    unsigned int(32) sample_count;

    {
        if (version==0) {

            unsigned int(Per_Sample_IV_Size*8) InitializationVector;

            if (flags & 0x000002) {

                unsigned int(16) subsample_count;

                {

                    unsigned int(16) BytesOfClearData;

                    unsigned int(32) BytesOfProtectedData;

                } [subsample_count ]

            }

        }
    }
}

```

```

    } else if (version==1) {

        unsigned int(16) multi_IV_count;

        for (i=1; i <= multi_IV_count; i++) {

            unsigned int(8) multi_subindex_IV;

            unsigned int(Per_Sample_IV_Size*8) IV;

        }

        unsigned int(32) subsample_count;

        {

            unsigned int(16) multi_subindex;

            unsigned int(16) BytesOfClearData;

            unsigned int(32) BytesOfProtectedData;

        } [subsample_count]

    }

}[ sample_count ]
}

```

7.2.3

Add the following to the list of semantics:

- multi_IV_count, multi_subindex_IV, IV and multi_subindex SHALL conform to the definition specified in Clause 7.

8.1.1

Replace

Container: Movie ('moov') or Movie Fragment ('moof')

with

Container: Movie ('moov') or Movie Fragment ('moof') or 'meta' if no Movie ('moov')

8.2

Add the following new subclauses after 8.2:

8.3 Item encryption box

8.3.1 Definition

Box Type: 'ienc'

Container: Item Properties Box

Mandatory (per item): Yes for protected items using schemes defined in this document