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What's New In xDM 1.0 (Beta)

Introduction

xDM 0.9 was introduced in the xDAIS 5.00 release. Some changes were made for the xDM 1.0 release (Beta released in Q3 in xDAIS 5.10, final in Q1 2007 in xDAIS 5.20). This document provides an overview of those changes.


 Note! The xDM 0.9 interface will be deprecated, likely in late 2007 once xDM 1.0 has gained adoption.

General xDM 1.0 Changes

- The xDM 1.0 product will be provided in addition to the xDM 0.9 product in the `ti.xdais.dm` package.
- To enable both xDM 0.9 and 1.0 compliant algorithms/frameworks/apps to reside in a system, unique names were created as new interfaces were developed. For example, in 0.9, video decoders used the `IVIDDEC_` prefix; in xDM 1.0, they use the `IVIDDEC1_` prefix. In this way, there is no naming collision, and the two classes can coexist in a single application.
 - ♦ In fact, if an algorithm provider so wished, the algorithm could implement *both* interfaces. It could provide and document two function tables, one complying with the 0.9 interface, and the other complying with xDM 1.0. The system integrator could then chose which one to instantiate, perhaps based on which interface the application calling the algorithm was written to.
 - ♦ Note that when xDM 1.0 changes are backward compatible with the 0.9 spec (e.g. addition of enum values), the prefix generally remained. For example, this was the case with `ivideo.h` - there is no `ivideo1.h` as all changes were backward compatible.
- To improve channel density, the sizes of many of the speech structure fields have been decreased. We only did this for speech as those interfaces are often uses in very dense systems.
 - ♦ Note that the structures were padded when necessary to preserve 32-bit alignment. This is necessary because many of these structures support extended arguments immediately following the base structures; those fields must be 32-bit aligned.
- For improved performance of codec classes which didn't require multiple buffers (i.e. `XDM_BufDesc`), `XDM_SingleBufDesc` was introduced.
- Introduced `XDM_EUNSUPPORTED` error value (as a peer to `XDM_EOK`, `XDM_EFAIL`, and `XDM_ERUNTIME`). This will be reflected in the 1.0 classes as well (e.g. `ISPHDEC1_EUNSUPPORTED`), but not back-ported to 0.9 interfaces.
- Introduced `XDM_CmdId.XDM_GETVERSION`. Applications can issue this command to algorithms which support this to obtain a string describing the version of the codec.
- Introduced a data field of type `XDM_SingleBufDesc` to **all** `*1_Status` structures. This will be used to support the `XDM_GETVERSION` command, as well as enable the ability to pass arbitrary buffers of data between the codec and application in `control()` calls.

Speech

General

- Many `enum`'s were added, providing identifiers to use in the various structure fields.
 - ♦  Note, the xDM structure fields themselves are not defined using these `enum` data types in order to minimize structure sizes. Users of these `enum` values are encouraged **not** to use these `enum` data types for storage, but rather only for constants - consistent with xDM 0.9 usage.
- 0.9's `ISPEECH_CompoundLaw` data type is supplied in 1.0's `ISPEECH1_CompandingLaw`
- Fields were broken out into either generic (all speech codecs) or specific (some speech codecs), and the bulk of the common header file in 0.9 (i.e. `ispeech.h`) was separated into a generic (i.e. `ispeech1.h`) and a suite of codec family-specific headers (e.g. `ispeech_pcm.h`, `ispeech_amr.h`, etc). A key benefit of this approach is that future codec families can be introduced without modifying existing headers. This table shows the different fields and classifies them as generic, or which families support them.

Field	Generic (ispeech1.h)	AMR	EVRC	G726	PCM	G723	SMV	WBAMR
CompandingLaw				X	X			
VADSelect		X					X	
VADFlag	X							
PostFilter	X							
NoisePreProc			X			X	X	
TTYMode			X				X	
DTMFMode							X	
DataMode							X	
NullTrafficMode	X							
PackingType		X		X				X
CodecSelect	X							
BitRate		X				X		X
Mode			X				X	

Decode

- Introduced new module prefix - ISPHDEC1
- Added ISPHDEC1_FrameType
- ISPHDEC1_Params
 - ◆ Removed dataEnable
 - ◆ Added codecSelection and tablesPtr
- ISPHDEC1_InArgs
 - ◆ Removed size (this struct is no longer extendable), inBufferSize and bfiFlag
 - ◆ Added data buffer (and associated size) for SMV codec support - which allows "out of band" data to fill this buffer
- ISPHDEC1_Status
 - ◆ Removed dataMode and bufInfo
 - ◆ Added compandingLaw, packingType and codecSelection
- ISPHDEC1_OutArgs
 - ◆ Removed size (this struct is no longer extendable) and mode
 - ◆ Added extendedError and dataSize
- process()
 - ◆ XDM_BufDesc inBufs replaced by XDM_SingleBufDesc inCodeWords
 - ◆ XDM_BufDesc outBufs replaced by XDM_SingleBufDesc outSamples

Encode

- Introduced new module prefix - ISPHENC1
- Introduced ISPHENC1_ENOOUTPUT.
- Added ISPHENC1_FrameType
- ISPHENC1_Params
 - ◆ Removed vadSelection
 - ◆ Added codecSelection and tablesPtr
- ISPHENC1_InArgs
 - ◆ Removed size (this struct is no longer extendable)
 - ◆ Added data buffer (and associated size) for SMV codec support - which allows "out of band" data to be passed in.
- ISPHENC1_OutArgs
 - ◆ Removed size (this struct is no longer extendable), rate and outbufferSize
 - ◆ Added extendedError
- ISPHENC1_DynamicParams

- ◆ Removed homingMode
- ISPHENC1_Status
 - ◆ Removed homingMode and bufInfo
 - ◆ Added compandingLaw, packingType, vadSelection and codecSelection
- process()
 - ◆ XDM_BufDesc inBufs replaced by XDM_SingleBufDesc inSamples
 - ◆ XDM_BufDesc outBufs replaced by XDM_SingleBufDesc outCodeWords

Video

General

- Addition of several values to IVIDEO_FrameSkip enum to better enable trick play.
- Addition of several values to IVIDEO_FrameType enum to support more frame types.
- Added IVIDEO_ContentType.IVIDEO_CONTENTTYPE_NA enum value for when the content type is not available.

Decode

- Introduced new module prefix - IVIDDEC1
- IVIDDEC1_OutArgs
 - ◆ Added inputFrameStatus and outputFrameStatus fields, and associated IVIDEO_InputFrameStatus and IVIDEO_OutputFrameStatus enums, to manage buffer ownership between application and algorithm.
 - ◆ Added topFieldFirst field to indicate how the application should display the top field.
 - ◆ Added repeatFirstField field to report whether the first field should be repeated.
 - ◆ Added repeatFrame field to report how many times the application should display progressive frames (if progressive content)
 - ◆ Added displayContentType field to report the content type to the application.
- VIDDEC1_DynamicParams
 - ◆ Added frameOrder field, and associated IVIDDEC1_FrameOrder enum, to enable the application to specify how the codec should deliver decoded frames.

Encode

- Introduced new module prefix - IVIDENC1
- IVIDENC1_Params

- ◆ Added `reconChromaFormat` field to enable the application to specify the data format the algorithm should present the reconstruction buffers in.

Audio

Decode

- Introduced new module prefix - `IAUDDEC1`
- `IAUDDEC1_Params`
 - ◆ Removed `maxSampleRate`, `maxBitRate`, `maxNoOfCh` fields.
 - ◆ Added `outputPCMWidth` and `pcmFormat` fields.
- `IAUDDEC1_InArgs`
 - ◆ Added `desiredChannelMode` and `lfeFlag` fields.
- `IAUDDEC1_OutArgs`
 - ◆ Added `numSamples`, `channelMode`, `lfeFlag`, and `dualMonoMode` fields.
- `IAUDDEC1_DynamicParams`
 - ◆ Removed `outputFormat` field.
 - ◆ Added `downSampleSbrFlag` field.
- `IAUDDEC1_Status`
 - ◆ Removed `numChannels`, `numLFEChannels`, `autoPosition`, `fastFwdLen`, and `frameLen` fields.
 - ◆ Added `validFlag`, `lfeFlag`, `channelMode`, `numSamples`, and `dualMonoMode` fields.
 - ◆ Renamed `outputFormat` field to `pcmFormat`.

Encode

- Introduced new module prefix - `IAUDENC1`
- `IAUDENC1_Params`
 - ◆ Removed `encodingPreset`, `maxSampleRate`, and `maxNoOfCh` fields.
 - ◆ Added `sampleRate`, `bitRate`, `channelMode`, `encMode`, `inputFormat`, and `inputBitsPerSample` fields.
 - ◆ Renamed `maxBitrate` to `dualMonoMode`, `crcFlag`, `ancFlag`, and `lfeFlag` fields.
- `IAUDENC1_InArgs`
 - ◆ Added `numInSamples` and `ancData` fields.
- `IAUDENC1_OutArgs`
 - ◆ Added `numZeroesPadded` field.
- `IAUDENC1_DynamicParams`
 - ◆ Removed `inputFormat`, `numChannels`, `numLFEChannels`, and `inputBitsPerSample` fields.

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- ♦ Added `channelMode`, `lfeFlag`, and `dualMonoMode` fields.
- `IAUDENC1_Status`
 - ♦ Removed `frameLen` field.
 - ♦ Added `validFlag`, `lfeFlag`, `bitRate`, `sampleRate`, `channelMode`, and `encMode` fields.

Image

Decode

- Introduced new module prefix - `IIMGDEC1`
- `IIMGDEC1_Status`
 - ♦ Renamed `outChromaformat` to `outputChromaFormat`.
- `IIMGDEC1_OutArgs`
 - ♦ Renamed `bytesconsumed` to `bytesConsumed`.

Encode

- Introduced new module prefix - `IIMGENC1`