NAME

H261 – H.261 decompressor for compressed image sequences

DESCRIPTION

CCITT Recommendation H.261, Video Codec for Audiovisual Services at p x 64 kbit/s, is an international standard for videophone and videoconferencing. It describes the moving picture component of audiovisual services at the rates of p x 64 kbit/s, where p is in the range 1 to 30.

The XIL H261 codec implements the H.261 standard without the transmission coder/decoder; i.e., the XIL bitstream does not contain any Error Correction Framing bits.

The current release of the XIL library does not contain an implementation of an H.261 compressor. Calls to **xil_compress**(3) will produce an error unless a third party H.261 compressor has been installed.

Image Types

The H261 decompressor produces 3-band, XIL_BYTE images in the XIL library's "ycc601" color space (The XIL image color space will not be examined or set by the H261 codec, but the codec assumes its input image has the proper color space). The width and height of the images must be either Common Intermediate Format (CIF), which is 352 wide by 288 high, or Quarter CIF (QCIF), which is 176 wide by 144 high.

Creating a CIS

To create an H.261 compressed image sequence (CIS), specify "H261" for the *compressorname* argument in **xil_cis_create**(3).

Getting and Setting H261 Attributes

Use **xil_cis_get_attribute**(3) and **xil_cis_set_attribute**(3) to get and set H261 CIS attributes. These attributes are as described in the following sections. Refer to the example section for additional information.

H261 Compression Attributes

The following paragraphs describe the H.261 CIS attributes available with the XIL library. All structures and enumerations are defined via **xil.h.** Note that if you are setting an attribute and that attribute is a structure, you must pass the address of that structure. If you are getting an attribute, you always pass the address of the attribute. If you are getting a structure attribute, you must pass a pointer to a pointer to the structure and XIL will set the pointer to the structure. You must free the memory for this structure (using free(3C)) when it is no longer needed.

COMPRESSOR_BITS_PER_IMAGE

Description	Encode images with this number of bits per image. This is normally bits_per_second/frames_per_second.
Access	get and set
Type	Integer
Values	value must be greater than or equal to 0
Default	5069 (0.2 bits/pixel at QCIF resolution)

COMPRESSOR_IMAGE_SKIP

Description	Number of images skipped between compressed images. Controls the Temporal Reference counter in the bitstream. (Temporal Reference is incremented by 1 + COMPRESSOR_IMAGE_SKIP)
Access	get and set
Type	Integer
Values	0-31
Default	0

COMPRESSOR_MV_SEARCH_RANGE

Description	Set motion vector search range. Value 15 is the maximum H.261 search range. Value 0 means that the search range is limited to the spatially corresponding block in the previous picture. This attribute is only a suggestion and may be ignored by the compressor. It may be used to speed up compression at the expense of compression quality.
Access	get and set

Type	typedef struct {
	    int x; /∗ horizontal search limit ∗/
	    int y; /∗ vertical search limit ∗/
	} XilH261MVSearchRange;

Values	*x:* Can have a value in the range of 0-15 *y:* Can have a value in the range of 0-15
Default	15 for both x and y

COMPRESSOR_LOOP_FILTER

Description	Allow encoder to use loop filtering. This attribute is only a suggestion and may be ignored by the compressor. It may be used to speed up compression (and/or decompression of the resulting bitstream) at the expense of compression quality.
Access	get and set
Type	Xil_boolean
Values	*TRUE:* Loop filtering turned on *FALSE:* Loop filtering turned off
Default	*TRUE*

COMPRESSOR_ENCODE_INTRA

Description	Cause encoder to encode pictures in INTRA mode with coding parameters to avoid buffer overflow. (This attribute can be used by the application in response to a Fast Update signal sent via H.221).
Access	get and set
Type	Xil_boolean
Values	*TRUE:* Intra-only coding turned on *FALSE:* Intra-only coding turned off
Default	*FALSE*

COMPRESSOR_FREEZE_RELEASE

Description	Set the Freeze Picture Release bit in each picture in the bitstream, starting with the next compressed picture.
Access	get and set
Type	Xil_boolean
Values	*TRUE:* Set the Freeze Picture Release bit in the bitstream. *FALSE:* Do not set the Freeze Picture Release bit in the bitstream.
Default	*FALSE*

COMPRESSOR_SPLIT_SCREEN

Description	Set the Split Screen Indicator bit in each picture in the bitstream, starting with the next compressed picture.
Access	get and set
Type	Xil_boolean
Values	*TRUE:* Set the Split Screen Indicator bit in the bitstream. *FALSE:* Do not set the Split Screen Indicator bit in the bitstream.
Default	*FALSE*

COMPRESSOR_DOC_CAMERA

Description	Set the Document Camera Indicator bit in each picture in the bitstream, starting with the next compressed picture.
Access	get and set
Type	Xil_boolean
Values	*TRUE:* Set the Document Camera Indicator bit in the bitstream. *FALSE:* Do not set the Document Camera Indicator bit in the bitstream.

Default *FALSE*

H261 Decompression Attributes

IGNORE_HISTORY

Description If TRUE, perform forward seeks without updating the decoding history and allow backward seeking (decompression after these seeks may yield incomplete results). If FALSE, maintain proper decoding history during forward seeks and disallow backward seeking. **xil_cis_get_random_access**(3) will return TRUE if *IGNORE_HISTORY* is TRUE, and will return FALSE if *IGNORE_HISTORY* is FALSE.

Access get and set

Type Xil_boolean

Values *TRUE:* Allow backward seeks and perform fast forward seeks.

FALSE: Perform correct seeking.

Default *FALSE*

DECOMPRESSOR_FREEZE_RELEASE

Description Return value of the Freeze Picture Release bit from the picture header of the most recently decompressed picture. Value is available immediately after executing an **xil_decompress**(3) call and may be "gotten" and tested without compromising the execution of a decompression molecule.

Access get

Type Xil_boolean

Values *TRUE:* Freeze Picture Release bit is set.

FALSE: Freeze Picture Release bit is not set.

Default Value is undefined if no pictures have been decompressed.

DECOMPRESSOR_SPLIT_SCREEN

Description Return value of the Split Screen Indicator bit from the picture header of the most recently decompressed picture. Value is available immediately after executing an **xil_decompress**(3) call and may be "gotten" and tested without compromising the execution of a decompression molecule.

Access get

Type Xil_boolean

Values *TRUE:* Split Screen Indicator bit is set.

FALSE: Split Screen Indicator bit is not set.

Default　Value is undefined if no pictures have been decompressed.

DECOMPRESSOR_DOC_CAMERA

Description　Return value of the Document Camera Indicator bit from the picture header of the most recently decompressed picture. Value is available immediately after executing an **xil_decompress**(3) call and may be "gotten" and tested without compromising the execution of a decompression molecule.

Access　get

Type　Xil_boolean

Values　*TRUE:* Document Camera Indicator bit is set.

FALSE: Document Camera Indicator bit is not set.

Default　Value is undefined if no pictures have been decompressed.

DECOMPRESSOR_SOURCE_FORMAT

Description　Return value of the Source Format bit from the picture header of the most recently decompressed picture. Value is available immediately after executing an **xil_decompress**(3) call and may be "gotten" and tested without compromising the execution of a decompression molecule.

Access　get

Type
```
typedef enum {
        QCIF, CIF
} XilH261SourceFormat;
```

Values　*CIF:* Source Format (picture size) is Common Intermediate Format (CIF)

QCIF: Source Format (picture size) is Quarter Common Intermediate Format (QCIF)

Default　Value is undefined if no pictures have been decompressed.

DECOMPRESSOR_TEMPORAL_REFERENCE

Description　Return value of the Temporal Reference from the picture header of the most recently decompressed picture. Temporal Reference is formed by incrementing its value in the previously transmitted picture header by one plus the number of non-transmitted pictures (at 29.97 Hz) since the last transmitted one. Arithmetic is performed modulo 32. Value is available immediately after executing an **xil_decompress**(3) call and may be "gotten" and tested without compromising the execution of a decompression molecule.

Access　get

Type	Integer
Values	*value* can be an integer from 0 to 31.
Default	Value is undefined if no pictures have been decompressed.

EXAMPLES

The following example opens and closes an H.261 CIS using the XIL library:

```
XilSystemState State;
XilCis cis;
State = xil_open();
cis = xil_cis_create(State, "H261");

-- calls to H261-specific compression routines --

xil_cis_destroy(cis);
xil_close(State);
```

The following example sets an H.261 CIS attribute called *COMPRESSOR_LOOP_FILTER* to TRUE. Note that because this attribute is not a structure, it is not necessary to pass the address of *COMPRESSOR_LOOP_FILTER* when setting it.

```
XilCis cis;

xil_cis_set_attribute(cis,"COMPRESSOR_LOOP_FILTER", (void *) TRUE);
```

The following example returns the value of an H.261 CIS attribute called *DECOMPRESSOR_DOC_CAMERA.* Note that when getting an attribute it is always necessary to pass the address.

```
Xil_boolean on;
XilCis cis;

xil_cis_get_attribute(cis, "DECOMPRESSOR_DOC_CAMERA", (void **) &on);
```

NOTES

The **xil_cis_set_attribute** () and **xil_cis_get_attribute** () calls are used to modify the default behavior of a specific compressor. Generic attributes of compressors are set by individual function calls.

SEE ALSO

xil_cis_create(3), **xil_cis_get_attribute**(3), **xil_cis_get_bits_ptr**(3), **xil_compress**(3), **xil_decompress**(3).