Intel® QuickAssist Technology Compression API Reference

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Based on API version 2.6

(See Release Notes to map API version to software package version.)

Reference Number: 330686-012

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Reference Number: 330686-012

Revision History

Date	Revision	Description
November 2020	012	Changing version of the compression API to v2.6 Adding support for integrity CRCs.
September 2020	011	Adding cpaDcDeflateCompressBound() Changed version of the compression API to v2.5
June 2020	010	Adding cpaDcUpdateSession() Changed version of the compression API to v2.4
January 2019	009	Adding chaining support. Changed version of the compression API to v2.3
April 2018	008	Adding support for compressAndVerifyAndRecover.
February 2018	007	Adding support for Compress and Verify strict mode.
June 2016	006	Adding support for: - Compress and Verify - Batch and Pack Compression
October 2015	005	Changed version of the compression API to v2.0. Added new error codes to CpaDcReqStatus in cpa_dc.h.
September 2015	004	Incrementing DC API version number to v1.6. Adding CPA_STATUS_UNSUPPORTED as a return status for each function and callback Deprecating use of fileType and deflateWindowSize fields from CpaDcSessionSetupData in cpa_dc.h. Clarifying documentation for srcBufferLen, bufferLenToCompress, destBufferLen and bufferLenForData fields in CpaDcDpOpData in cpa_dc_dp.h
August 2015	003	IXA00391973: Adding reportParityError to the DC instance capabilities. Incrementing the DC API version number of 1.5
October 2014	002	Adding cpaDcResetSession API
June 2014	001	First public version of the document. Based on Intel Confidential document number 410926-1.3 with the revision history of that document retained for reference purposes.
February 2013	1.3	· Supports supplying multiple intermediate buffer lists when starting a compression instance. Also provides a utility function to determine the number of intermediate buffer lists required by an implementation. · API extensions to support endOfLastBlock detection within a deflate stream.
January 2013	1.2	Resolves the following work requests: · TECG00000185: Changing use of flush flags for stateless compression. Adding support for passing an initial checksum into a stateless compression request. Adding a constraint that cpaDcGenerateFooter() is not supported for stateless operations.
	1.1	Resolves the following work requests:

November 2012		· TECG00000189: Add a unique instance identifier to CpaInstanceInfo2 · TECG00000193: Enhanced auto select best
October 2012	1.0	Resolves the following work requests: · TECG00000186: Add instance notification support for RESTARTING & RESTARTED events and CPA_STATUS_RESTARTING return codes.
June 2012	0.93	Resolved review comments against previous version which resulted in minor updates to the API comments. Resolved the following work requests: · TECG00000179: Adding version number to compression API
May 2012	0.92	Resolved the following work requests: · TECG00000172: Remove references to cpaDcSessionCreate in cpa_dc.h · TECG00000170: cpaCySymDpSessionCtxGetSize() returns a fixed value · TECG00000173 and TECG00000174 updates/cleanup of api comments · TECG00000174: Updated checksum processing rules.
March 2012	0.92RC6	Added -12 and -13 error codes
March 2012	0.92RC7	Resolved the following work requests: · TECG00000166: Added ability to query bus address information for a CpaInstance.
November 2011	0.92RC5	Added internal memory store to capabilities reporting
September 2011	0.92RC4	Addressed review comments
July 2011	0.92RC3	Completed data plane API · Moved results structure to 1st 64 byte section · Added buffer sizes for use by driver
May 2011	0.92RC2	Addressed comments in data plane API
March 2011	0.92RC1	Added data plane API
October 2010	0.91RC2	Minor typo fixes
September 2010	0.91RC1	Based on feedback, incorporated the following: · Converted statistics counters to 64 bit · Improved the results structure · Updated memory configuration for consistency with other services
March 2010	0.9RC5	Based on review and feedback, incorporated the following: • Added a results structure to the compress and decompress interfaces, and to the callback API 1. added enums to define the potential failures of the accelerators 2. Intermediate buffer is now a buffer list.
January 2010	0.9RC4-2	Added size of context field to cpaDcGetSessionSize

December 2009	0.90RC4	Based on feedback, incorporated the following: • Separated checksum algorithms in capabilities • Added return code CPA_DC_BAD_DATA return code • Bundled return information to include bytes consumed, bytes produced and checksum • Clean up of some documentation
Sept 21 2009	0.90RC3	Updated as a result of review, incorporate the following changes; • Compression window capabilities now split for compress and decompress. • Update statistic to be more consistent with other APIs. • Added pHistoryBuffer to support state-ful deflate. • Removed reference to having different instances able to process the same session.
July 2009	0.90RC2	Added distinction in capabilities for stateful and stateless, compression and decompression Replaced cpaPmGetInstanceInfo with cpaPmGetInstanceInfo2 that gets a new info structure, CpaInstanceInfo2, which supersedes the previous version. Additional info includes physical id, core affinity, and NUMA relevant node.
June 2009	0.90RC1	Added capabilities Add distinction between stateful and stateless. Updated with cpaDcGet/SetMemoryConfiguration Changed from buffer lists to u32 pointers for responses.
February 2009	0.74	1. Addition of response Arguments - APIs can use source and destination buffers in an easier fashion 2. Change from flat buffers to buffer lists to align with QA conventions 3. Major re-write of description of buffer rules 4. Addition of dynamic Huffman trees 5. Removal of file based functions. It was deemed that this functionality could be built using other buffer based APIs 6. Clean up of session parameters and various typos
December 2008	0.73	First released version of this document with new generation process.

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1 Deprecated List

Class **_CpaDcSessionSetupData**
As of v1.6 of the Compression API, the fileType and deflateWindowSize fields in this structure have been deprecated and should not be used.

Class **_CpaInstanceInfo**
As of v1.3 of the Crypto API, this structure has been deprecated, replaced by CpaInstanceInfo2.

Global **CPA_DEPRECATED**
As of v1.3 of the Crypto API, this enum has been deprecated, replaced by **CpaAccelerationServiceType**.

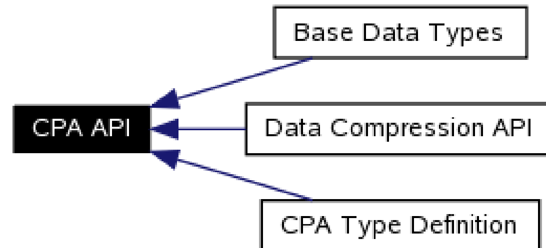
Global **CPA_DEPRECATED**
As of v1.3 of the Crypto API, this enum has been deprecated, replaced by **CpaOperationalState**.

Global **CpaDcFileType**
As of v1.6 of the Compression API, this enum has been deprecated.

Global **CpaDcCompType**
As of v1.6 of the Compression API, CPA_DC_LZS, CPA_DC_ELZS and CPA_DC_LZSS have been deprecated and should not be used.

2 CPA API

Collaboration diagram for CPA API:



2.1 Detailed Description

File: cpa.h

This is the top level API definition for Intel(R) QuickAssist Technology. It contains structures, data types and definitions that are common across the interface.

2.2 Modules

- **Base Data Types**
- **CPA Type Definition**
- **Data Compression API**

3 Base Data Types

[CPA API]

Collaboration diagram for Base Data Types:

3.1 Detailed Description

File: cpa.h

The base data types for the Intel CPA API.

3.2 Data Structures

- struct **_CpaFlatBuffer**
- struct **_CpaBufferList**
- struct **_CpaPhysFlatBuffer**
- struct **_CpaPhysBufferList**
- struct **_CpaInstanceInfo**
- struct **_CpaPhysicalInstanceId**
- struct **_CpaInstanceInfo2**

3.3 Defines

- #define **CPA_INSTANCE_HANDLE_SINGLE**
- #define **CPA_DP_BUFLIST**
- #define **CPA_STATUS_SUCCESS**
- #define **CPA_STATUS_FAIL**
- #define **CPA_STATUS_RETRY**
- #define **CPA_STATUS_RESOURCE**
- #define **CPA_STATUS_INVALID_PARAM**
- #define **CPA_STATUS_FATAL**
- #define **CPA_STATUS_UNSUPPORTED**
- #define **CPA_STATUS_RESTARTING**
- #define **CPA_STATUS_MAX_STR_LENGTH_IN_BYTES**
- #define **CPA_STATUS_STR_SUCCESS**
- #define **CPA_STATUS_STR_FAIL**
- #define **CPA_STATUS_STR_RETRY**
- #define **CPA_STATUS_STR_RESOURCE**
- #define **CPA_STATUS_STR_INVALID_PARAM**
- #define **CPA_STATUS_STR_FATAL**
- #define **CPA_STATUS_STR_UNSUPPORTED**
- #define **CPA_INSTANCE_MAX_NAME_SIZE_IN_BYTES**
- #define **CPA_INSTANCE_MAX_ID_SIZE_IN_BYTES**
- #define **CPA_INSTANCE_MAX_VERSION_SIZE_IN_BYTES**

3.4 Typedefs

- typedef void * **CpaInstanceHandle**
- typedef **Cpa64U CpaPhysicalAddr**
- typedef **CpaPhysicalAddr**(* **CpaVirtualToPhysical**)(void *pVirtualAddr)
- typedef **_CpaFlatBuffer CpaFlatBuffer**
- typedef **_CpaBufferList CpaBufferList**
- typedef **_CpaPhysFlatBuffer CpaPhysFlatBuffer**
- typedef **_CpaPhysBufferList CpaPhysBufferList**
- typedef **Cpa32S CpaStatus**
- typedef enum **_CpaInstanceType CPA_DEPRECATED**
- typedef enum **_CpaAccelerationServiceType CpaAccelerationServiceType**
- typedef enum **_CpaInstanceState CPA_DEPRECATED**
- typedef enum **_CpaOperationalState CpaOperationalState**
- typedef **_CpaInstanceInfo CPA_DEPRECATED**
- typedef **_CpaPhysicalInstanceId CpaPhysicalInstanceId**
- typedef **_CpaInstanceInfo2 CpaInstanceInfo2**
- typedef enum **_CpaInstanceEvent CpaInstanceEvent**

3.5 Enumerations

- enum **_CpaInstanceType** {
  CPA_INSTANCE_TYPE_CRYPTO,
  CPA_INSTANCE_TYPE_DATA_COMPRESSION,
  CPA_INSTANCE_TYPE_RAID,
  CPA_INSTANCE_TYPE_XML,
  CPA_INSTANCE_TYPE_REGEX
  }
- enum **_CpaAccelerationServiceType** {
  CPA_ACC_SVC_TYPE_CRYPTO,
  CPA_ACC_SVC_TYPE_DATA_COMPRESSION,
  CPA_ACC_SVC_TYPE_PATTERN_MATCH,
  CPA_ACC_SVC_TYPE_RAID,
  CPA_ACC_SVC_TYPE_XML,
  CPA_ACC_SVC_TYPE_VIDEO_ANALYTICS
  }
- enum **_CpaInstanceState** {
  CPA_INSTANCE_STATE_INITIALISED,
  CPA_INSTANCE_STATE_SHUTDOWN
  }
- enum **_CpaOperationalState** {
  CPA_OPER_STATE_DOWN,
  CPA_OPER_STATE_UP
  }
- enum **_CpaInstanceEvent** {
  CPA_INSTANCE_EVENT_RESTARTING,
  CPA_INSTANCE_EVENT_RESTARTED,
  CPA_INSTANCE_EVENT_FATAL_ERROR
  }

3.6 Data Structure Documentation

3.6.1 _CpaFlatBuffer Struct Reference

3.6.1.1 Detailed Description

Flat buffer structure containing a pointer and length member.

A flat buffer structure. The data pointer, pData, is a virtual address. An API instance may require the actual data to be in contiguous physical memory as determined by **CpaInstanceInfo2**.

3.6.1.2 Data Fields

- **Cpa32U dataLenInBytes**
- **Cpa8U * pData**

3.6.1.3 Field Documentation

Cpa32U _CpaFlatBuffer::dataLenInBytes

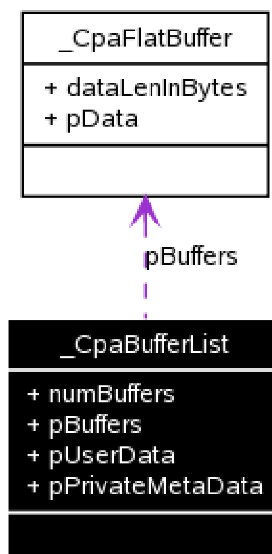
Data length specified in bytes. When used as an input parameter to a function, the length specifies the current length of the buffer. When used as an output parameter to a function, the length passed in specifies the maximum length of the buffer on return (i.e. the allocated length). The implementation will not write past this length. On return, the length is always unchanged.

Cpa8U* _CpaFlatBuffer::pData

The data pointer is a virtual address, however the actual data pointed to is required to be in contiguous physical memory unless the field requiresPhysicallyContiguousMemory in CpaInstanceInfo2 is false.

3.6.2 _CpaBufferList Struct Reference

Collaboration diagram for _CpaBufferList:



3.6.2 _CpaBufferList Struct Reference

3.6.2.1 Detailed Description

Scatter/Gather buffer list containing an array of flat buffers.

A scatter/gather buffer list structure. This buffer structure is typically used to represent a region of memory which is not physically contiguous, by describing it as a collection of buffers, each of which is physically contiguous.

Note:

The memory for the pPrivateMetaData member must be allocated by the client as physically contiguous memory. When allocating memory for pPrivateMetaData, a call to the corresponding BufferListGetMetaSize function (e.g. cpaCyBufferListGetMetaSize) MUST be made to determine the size of the Meta Data Buffer. The returned size (in bytes) may then be passed in a memory allocation routine to allocate the pPrivateMetaData memory.

3.6.2.2 Data Fields

- **Cpa32U numBuffers**
- **CpaFlatBuffer** * **pBuffers**
- void * **pUserData**
- void * **pPrivateMetaData**

3.6.2.3 Field Documentation

Cpa32U _CpaBufferList::numBuffers

Number of buffers in the list

CpaFlatBuffer* **_CpaBufferList::pBuffers**

Pointer to an unbounded array containing the number of CpaFlatBuffers defined by numBuffers

void* **_CpaBufferList::pUserData**

This is an opaque field that is not read or modified internally.

void* **_CpaBufferList::pPrivateMetaData**

Private representation of this buffer list. The memory for this buffer needs to be allocated by the client as contiguous data. The amount of memory required is returned with a call to the corresponding BufferListGetMetaSize function. If that function returns a size of zero then no memory needs to be allocated, and this parameter can be NULL.

3.6.3 _CpaPhysFlatBuffer Struct Reference

3.6.3.1 Detailed Description

Flat buffer structure with physical address.

Functions taking this structure do not need to do any virtual to physical address translation before writing the buffer to hardware.

3.6.3.2 Data Fields

- **Cpa32U dataLenInBytes**
- **Cpa32U reserved**

- **CpaPhysicalAddr bufferPhysAddr**

3.6.3.3 Field Documentation

Cpa32U _CpaPhysFlatBuffer::dataLenInBytes

Data length specified in bytes. When used as an input parameter to a function, the length specifies the current length of the buffer. When used as an output parameter to a function, the length passed in specifies the maximum length of the buffer on return (i.e. the allocated length). The implementation will not write past this length. On return, the length is always unchanged.

Cpa32U _CpaPhysFlatBuffer::reserved

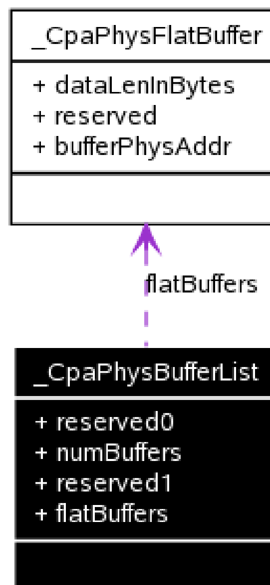
Reserved for alignment

CpaPhysicalAddr _CpaPhysFlatBuffer::bufferPhysAddr

The physical address at which the data resides. The data pointed to is required to be in contiguous physical memory.

3.6.4 _CpaPhysBufferList Struct Reference

Collaboration diagram for _CpaPhysBufferList:



3.6.4.1 Detailed Description

Scatter/gather list containing an array of flat buffers with physical addresses.

Similar to **CpaBufferList**, this buffer structure is typically used to represent a region of memory which is not physically contiguous, by describing it as a collection of buffers, each of which is physically contiguous. The difference is that, in this case, the individual "flat" buffers are represented using physical, rather than virtual, addresses.

3.6.4.2 Data Fields

- **Cpa64U reserved0**
- **Cpa32U numBuffers**
- **Cpa32U reserved1**
- **CpaPhysFlatBuffer flatBuffers** []

3.6.4.3 Field Documentation

Cpa64U _CpaPhysBufferList::reserved0

Reserved for internal usage

Cpa32U _CpaPhysBufferList::numBuffers

Number of buffers in the list

Cpa32U _CpaPhysBufferList::reserved1

Reserved for alignment

CpaPhysFlatBuffer _CpaPhysBufferList::flatBuffers[]

Array of flat buffer structures, of size numBuffers

3.6.5 _CpaInstanceInfo Struct Reference

3.6.5.1 Detailed Description

Instance Info Structure

Deprecated:

As of v1.3 of the Crypto API, this structure has been deprecated, replaced by CpaInstanceInfo2.

Structure that contains the information to describe the instance.

3.6.5.2 Data Fields

- enum **_CpaInstanceType type**
- enum **_CpaInstanceState state**
- **Cpa8U name** [CPA_INSTANCE_MAX_NAME_SIZE_IN_BYTES]
- **Cpa8U version** [CPA_INSTANCE_MAX_VERSION_SIZE_IN_BYTES]

3.6.5.3 Field Documentation

enum **_CpaInstanceType _CpaInstanceInfo::type**

Type definition for this instance.

enum **_CpaInstanceState _CpaInstanceInfo::state**

Operational state of the instance.

Cpa8U _CpaInstanceInfo::name[CPA_INSTANCE_MAX_NAME_SIZE_IN_BYTES]

Simple text string identifier for the instance.

Cpa8U _CpaInstanceInfo::version[CPA_INSTANCE_MAX_VERSION_SIZE_IN_BYTES]

Version string. There may be multiple versions of the same type of instance accessible through a particular library.

3.6.6 _CpaPhysicalInstanceId Struct Reference

3.6.6.1 Detailed Description

Physical Instance ID

Identifies the physical instance of an accelerator execution engine.

Accelerators grouped into "packages". Each accelerator can in turn contain one or more execution engines. Implementations of this API will define the packageId, acceleratorId, executionEngineId and busAddress as appropriate for the implementation. For example, for hardware-based accelerators, the packageId might identify the chip, which might contain multiple accelerators, each of which might contain multiple execution engines. The combination of packageId, acceleratorId and executionEngineId uniquely identifies the instance.

Hardware based accelerators implementing this API may also provide information on the location of the accelerator in the busAddress field. This field will be defined as appropriate for the implementation. For example, for PCIe attached accelerators, the busAddress may contain the PCIe bus, device and function number of the accelerators.

3.6.6.2 Data Fields

- **Cpa16U packageId**
- **Cpa16U acceleratorId**
- **Cpa16U executionEngineId**
- **Cpa16U busAddress**
- **Cpa32U kptAcHandle**

3.6.6.3 Field Documentation

Cpa16U _CpaPhysicalInstanceId::packageId

Identifies the package within which the accelerator is contained.

Cpa16U _CpaPhysicalInstanceId::acceleratorId

Identifies the specific accelerator within the package.

Cpa16U _CpaPhysicalInstanceId::executionEngineId

Identifies the specific execution engine within the accelerator.

Cpa16U _CpaPhysicalInstanceId::busAddress

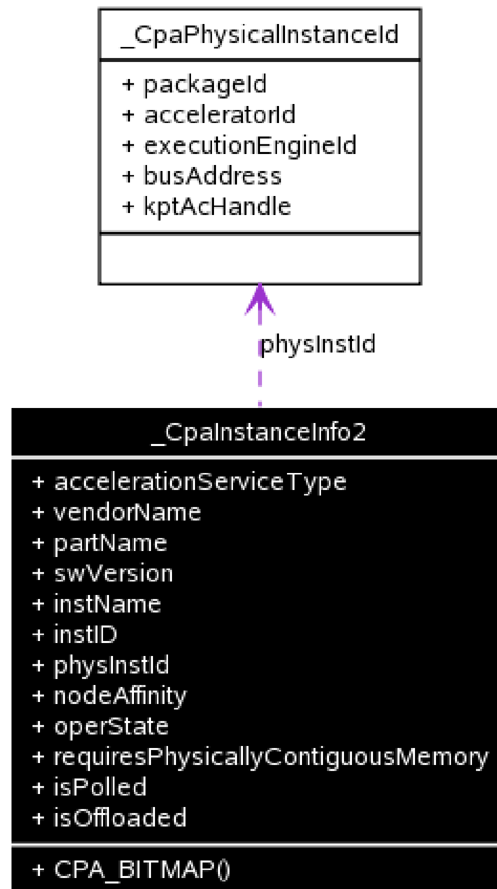
Identifies the bus address associated with the accelerator execution engine.

Cpa32U _CpaPhysicalInstanceId::kptAcHandle

Identifies the achandle of the accelerator.

3.6.7 _CpaInstanceInfo2 Struct Reference

Collaboration diagram for _CpaInstanceInfo2:



3.6.7.1 Detailed Description

Instance Info Structure, version 2

Structure that contains the information to describe the instance.

3.6.7.2 Public Member Functions

- **CPA_BITMAP** (coreAffinity, CPA_MAX_CORES)

3.6.7.3 Data Fields

- **CpaAccelerationServiceType accelerationServiceType**
- **Cpa8U vendorName** [CPA_INST_VENDOR_NAME_SIZE]
- **Cpa8U partName** [CPA_INST_PART_NAME_SIZE]
- **Cpa8U swVersion** [CPA_INST_SW_VERSION_SIZE]
- **Cpa8U instName** [CPA_INST_NAME_SIZE]
- **Cpa8U instID** [CPA_INST_ID_SIZE]
- **CpaPhysicalInstanceId physInstId**
- **Cpa32U nodeAffinity**
- **CpaOperationalState operState**
- **CpaBoolean requiresPhysicallyContiguousMemory**

- **CpaBoolean isPolled**
- **CpaBoolean isOffloaded**

3.6.7.4 Member Function Documentation

_CpaInstanceInfo2::CPA_BITMAP(coreAffinity ,
CPA_MAX_CORES
)

A bitmap identifying the core or cores to which the instance is affinitized in an SMP operating system.

The term core here is used to mean a "logical" core - for example, in a dual-processor, quad-core system with hyperthreading (two threads per core), there would be 16 such cores (2 processors x 4 cores/processor x 2 threads/core). The numbering of these cores and the corresponding bit positions is OS-specific. Note that Linux refers to this as "processor affinity" or "CPU affinity", and refers to the bitmap as a "cpumask".

The term "affinity" is used to mean that this is the core on which the callback function will be invoked when using the asynchronous mode of the API. In a hardware-based implementation of the API, this might be the core to which the interrupt is affinitized. In a software-based implementation, this might be the core to which the process running the algorithm is affinitized. Where there is no affinity, the bitmap can be set to all zeroes.

This bitmap should be manipulated using the macros **CPA_BITMAP_BIT_SET**, **CPA_BITMAP_BIT_CLEAR** and **CPA_BITMAP_BIT_TEST**.

3.6.7.5 Field Documentation

CpaAccelerationServiceType _CpaInstanceInfo2::accelerationServiceType

Type of service provided by this instance.

Cpa8U _CpaInstanceInfo2::vendorName[CPA_INST_VENDOR_NAME_SIZE]

String identifying the vendor of the accelerator.

Cpa8U _CpaInstanceInfo2::partName[CPA_INST_PART_NAME_SIZE]

String identifying the part (name and/or number).

Cpa8U _CpaInstanceInfo2::swVersion[CPA_INST_SW_VERSION_SIZE]

String identifying the version of the software associated with the instance. For hardware-based implementations of the API, this should be the driver version. For software-based implementations of the API, this should be the version of the library.

Note that this should NOT be used to store the version of the API, nor should it be used to report the hardware revision (which can be captured as part of the **partName**, if required).

Cpa8U _CpaInstanceInfo2::instName[CPA_INST_NAME_SIZE]

String identifying the name of the instance.

Cpa8U _CpaInstanceInfo2::instID[CPA_INST_ID_SIZE]

String containing a unique identifier for the instance

CpaPhysicalInstanceId _CpaInstanceInfo2::physInstId

Identifies the "physical instance" of the accelerator.

Cpa32U _CpaInstanceInfo2::nodeAffinity

Identifies the processor complex, or node, to which the accelerator is physically connected, to help identify locality in NUMA systems.

The values taken by this attribute will typically be in the range 0..n-1, where n is the number of nodes (processor complexes) in the system. For example, in a dual-processor configuration, n=2. The precise values and their interpretation are OS-specific.

CpaOperationalState _CpaInstanceInfo2::operState

Operational state of the instance.

CpaBoolean _CpaInstanceInfo2::requiresPhysicallyContiguousMemory

Specifies whether the data pointed to by flat buffers (**CpaFlatBuffer::pData**) supplied to this instance must be in physically contiguous memory.

CpaBoolean _CpaInstanceInfo2::isPolled

Specifies whether the instance must be polled, or is event driven. For hardware accelerators, the alternative to polling would be interrupts.

CpaBoolean _CpaInstanceInfo2::isOffloaded

Identifies whether the instance uses hardware offload, or is a software-only implementation.

3.7 Define Documentation

#define CPA_INSTANCE_HANDLE_SINGLE

Default instantiation handle value where there is only a single instance

Used as an instance handle value where only one instance exists.

#define CPA_DP_BUFLIST

Special value which can be taken by length fields on some of the "data plane" APIs to indicate that the buffer in question is of type CpaPhysBufferList, rather than simply an array of bytes.

#define CPA_STATUS_SUCCESS

Success status value.

#define CPA_STATUS_FAIL

Fail status value.

#define CPA_STATUS_RETRY

Retry status value.

#define CPA_STATUS_RESOURCE

The resource that has been requested is unavailable. Refer to relevant sections of the API for specifics on what the suggested course of action is.

#define CPA_STATUS_INVALID_PARAM

Invalid parameter has been passed in.

#define CPA_STATUS_FATAL

A serious error has occurred. Recommended course of action is to shutdown and restart the component.

#define CPA_STATUS_UNSUPPORTED

The function is not supported, at least not with the specific parameters supplied. This may be because a particular capability is not supported by the current implementation.

#define CPA_STATUS_RESTARTING

The API implementation is restarting. This may be reported if, for example, a hardware implementation is undergoing a reset. Recommended course of action is to retry the request.

#define CPA_STATUS_MAX_STR_LENGTH_IN_BYTES

API status string type definition

This type definition is used for the generic status text strings provided by cpaXxGetStatusText API functions. Common values are defined, for example see **CPA_STATUS_STR_SUCCESS**, **CPA_STATUS_FAIL**, etc., as well as the maximum size **CPA_STATUS_MAX_STR_LENGTH_IN_BYTES**.

Maximum length of the Overall Status String (including generic and specific strings returned by calls to cpaXxGetStatusText)

#define CPA_STATUS_STR_SUCCESS

Status string for **CPA_STATUS_SUCCESS**.

#define CPA_STATUS_STR_FAIL

Status string for **CPA_STATUS_FAIL**.

#define CPA_STATUS_STR_RETRY

Status string for **CPA_STATUS_RETRY**.

#define CPA_STATUS_STR_RESOURCE

Status string for **CPA_STATUS_RESOURCE**.

#define CPA_STATUS_STR_INVALID_PARAM

Status string for **CPA_STATUS_INVALID_PARAM**.

#define CPA_STATUS_STR_FATAL

Status string for **CPA_STATUS_FATAL**.

#define CPA_STATUS_STR_UNSUPPORTED

Status string for **CPA_STATUS_UNSUPPORTED**.

#define CPA_INSTANCE_MAX_NAME_SIZE_IN_BYTES

Maximum instance info name string length in bytes

#define CPA_INSTANCE_MAX_ID_SIZE_IN_BYTES

Maximum instance info id string length in bytes

#define CPA_INSTANCE_MAX_VERSION_SIZE_IN_BYTES

Maximum instance info version string length in bytes

3.8 Typedef Documentation

typedef void* **CpaInstanceHandle**

Instance handle type.

Handle used to uniquely identify an instance.

Note:
Where only a single instantiation exists this field may be set to **CPA_INSTANCE_HANDLE_SINGLE**.

typedef **Cpa64U CpaPhysicalAddr**

Physical memory address.

Type for physical memory addresses.

typedef **CpaPhysicalAddr**(* **CpaVirtualToPhysical**)(void *pVirtualAddr)

Virtual to physical address conversion routine.

This function is used to convert virtual addresses to physical addresses.

Context:
The function shall not be called in an interrupt context.

Assumptions:
None

Side-Effects:
None

Blocking:
This function is synchronous and blocking.

Reentrant:
No

Thread-safe:
Yes

Parameters:
`[in]` *pVirtualAddr* Virtual address to be converted.

Returns:
Returns the corresponding physical address. On error, the value NULL is returned.

Postcondition:
None

See also:
None

typedef struct **_CpaFlatBuffer CpaFlatBuffer**

Flat buffer structure containing a pointer and length member.

A flat buffer structure. The data pointer, pData, is a virtual address. An API instance may require the actual data to be in contiguous physical memory as determined by **CpaInstanceInfo2**.

typedef struct **_CpaBufferList CpaBufferList**

Scatter/Gather buffer list containing an array of flat buffers.

A scatter/gather buffer list structure. This buffer structure is typically used to represent a region of memory which is not physically contiguous, by describing it as a collection of buffers, each of which is physically contiguous.

Note:

The memory for the pPrivateMetaData member must be allocated by the client as physically contiguous memory. When allocating memory for pPrivateMetaData, a call to the corresponding BufferListGetMetaSize function (e.g. cpaCyBufferListGetMetaSize) MUST be made to determine the size of the Meta Data Buffer. The returned size (in bytes) may then be passed in a memory allocation routine to allocate the pPrivateMetaData memory.

typedef struct **_CpaPhysFlatBuffer CpaPhysFlatBuffer**

Flat buffer structure with physical address.

Functions taking this structure do not need to do any virtual to physical address translation before writing the buffer to hardware.

typedef struct **_CpaPhysBufferList CpaPhysBufferList**

Scatter/gather list containing an array of flat buffers with physical addresses.

Similar to **CpaBufferList**, this buffer structure is typically used to represent a region of memory which is not physically contiguous, by describing it as a collection of buffers, each of which is physically contiguous. The difference is that, in this case, the individual "flat" buffers are represented using physical, rather than virtual, addresses.

typedef **Cpa32S CpaStatus**

API status value type definition

This type definition is used for the return values used in all the API functions. Common values are defined, for example see **CPA_STATUS_SUCCESS**, **CPA_STATUS_FAIL**, etc.

typedef enum **_CpaInstanceType CPA_DEPRECATED**

Instance Types

Deprecated:

As of v1.3 of the Crypto API, this enum has been deprecated, replaced by **CpaAccelerationServiceType**.

Enumeration of the different instance types.

typedef enum **_CpaAccelerationServiceType CpaAccelerationServiceType**

Service Type

Enumeration of the different service types.

typedef enum **_CpaInstanceState CPA_DEPRECATED**

Instance State

Deprecated:
As of v1.3 of the Crypto API, this enum has been deprecated, replaced by **CpaOperationalState**.

Enumeration of the different instance states that are possible.

typedef enum **_CpaOperationalState CpaOperationalState**

Instance operational state

Enumeration of the different operational states that are possible.

typedef struct **_CpaInstanceInfo CPA_DEPRECATED**

Instance Info Structure

Deprecated:
As of v1.3 of the Crypto API, this structure has been deprecated, replaced by CpaInstanceInfo2.

Structure that contains the information to describe the instance.

typedef struct **_CpaPhysicalInstanceId CpaPhysicalInstanceId**

Physical Instance ID

Identifies the physical instance of an accelerator execution engine.

Accelerators grouped into "packages". Each accelerator can in turn contain one or more execution engines. Implementations of this API will define the packageId, acceleratorId, executionEngineId and busAddress as appropriate for the implementation. For example, for hardware-based accelerators, the packageId might identify the chip, which might contain multiple accelerators, each of which might contain multiple execution engines. The combination of packageId, acceleratorId and executionEngineId uniquely identifies the instance.

Hardware based accelerators implementing this API may also provide information on the location of the accelerator in the busAddress field. This field will be defined as appropriate for the implementation. For example, for PCIe attached accelerators, the busAddress may contain the PCIe bus, device and function number of the accelerators.

typedef struct **_CpaInstanceInfo2 CpaInstanceInfo2**

Instance Info Structure, version 2

Structure that contains the information to describe the instance.

typedef enum **_CpaInstanceEvent CpaInstanceEvent**

Instance Events

Enumeration of the different events that will cause the registered Instance notification callback function to be invoked.

3.9 Enumeration Type Documentation

enum **_CpaInstanceType**

Instance Types

Deprecated:

As of v1.3 of the Crypto API, this enum has been deprecated, replaced by **CpaAccelerationServiceType**.

Enumeration of the different instance types.

Enumerator:

CPA_INSTANCE_TYPE_CRYPTO	Cryptographic instance type
CPA_INSTANCE_TYPE_DATA_COMPRESSION	Data compression instance type
CPA_INSTANCE_TYPE_RAID	RAID instance type
CPA_INSTANCE_TYPE_XML	XML instance type
CPA_INSTANCE_TYPE_REGEX	Regular Expression instance type

enum **_CpaAccelerationServiceType**

Service Type

Enumeration of the different service types.

Enumerator:

CPA_ACC_SVC_TYPE_CRYPTO	Cryptography
CPA_ACC_SVC_TYPE_DATA_COMPRESSION	Data Compression
CPA_ACC_SVC_TYPE_PATTERN_MATCH	Pattern Match
CPA_ACC_SVC_TYPE_RAID	RAID
CPA_ACC_SVC_TYPE_XML	XML
CPA_ACC_SVC_TYPE_VIDEO_ANALYTICS	Video Analytics

enum **_CpaInstanceState**

Instance State

Deprecated:

As of v1.3 of the Crypto API, this enum has been deprecated, replaced by **CpaOperationalState**.

Enumeration of the different instance states that are possible.

Enumerator:

CPA_INSTANCE_STATE_INITIALISED	Instance is in the initialized state and ready for use.
CPA_INSTANCE_STATE_SHUTDOWN	Instance is in the shutdown state and not available for use.

enum **_CpaOperationalState**

Instance operational state

Enumeration of the different operational states that are possible.

Enumerator:

CPA_OPER_STATE_DOWN	Instance is not available for use. May not yet be initialized, or stopped.
CPA_OPER_STATE_UP	Instance is available for use. Has been initialized and started.

enum **_CpaInstanceEvent**

Instance Events

Enumeration of the different events that will cause the registered Instance notification callback function to be invoked.

Enumerator:

CPA_INSTANCE_EVENT_RESTARTING	Event type that triggers the registered instance notification callback function when and instance is restarting. The reason why an instance is restarting is implementation specific. For example a hardware implementation may send this event if the hardware device is about to be reset.
CPA_INSTANCE_EVENT_RESTARTED	Event type that triggers the registered instance notification callback function when and instance has restarted. The reason why an instance has restarted is implementation specific. For example a hardware implementation may send this event after the hardware device has been reset.
CPA_INSTANCE_EVENT_FATAL_ERROR	Event type that triggers the registered instance notification callback function when an error has been detected that requires the device to be reset. This event will be sent by all instances using the device, both on the host and guests.

4 CPA Type Definition

[CPA API]

Collaboration diagram for CPA Type Definition:

4.1 Detailed Description

File: cpa_types.h

This is the CPA Type Definitions.

4.2 Defines

- #define **NULL**
- #define **CPA_BITMAP**(name, sizeInBits)
- #define **CPA_BITMAP_BIT_TEST**(bitmask, bit)
- #define **CPA_BITMAP_BIT_SET**(bitmask, bit)
- #define **CPA_BITMAP_BIT_CLEAR**(bitmask, bit)
- #define **CPA_DEPRECATED**

4.3 Typedefs

- typedef uint8_t **Cpa8U**
- typedef int8_t **Cpa8S**
- typedef uint16_t **Cpa16U**
- typedef int16_t **Cpa16S**
- typedef uint32_t **Cpa32U**
- typedef int32_t **Cpa32S**
- typedef uint64_t **Cpa64U**
- typedef int64_t **Cpa64S**
- typedef enum **_CpaBoolean CpaBoolean**

4.4 Enumerations

- enum **_CpaBoolean** {
  CPA_FALSE,
  CPA_TRUE
  }

4.5 Define Documentation

#define NULL

File: cpa_types.h

NULL definition.

#define CPA_BITMAP (name,
sizeInBits)

Declare a bitmap of specified size (in bits).

This macro is used to declare a bitmap of arbitrary size.

To test whether a bit in the bitmap is set, use **CPA_BITMAP_BIT_TEST**.

While most uses of bitmaps on the API are read-only, macros are also provided to set (see **CPA_BITMAP_BIT_SET**) and clear (see **CPA_BITMAP_BIT_CLEAR**) bits in the bitmap.

#define CPA_BITMAP_BIT_TEST (bitmask,
bit)

Test a specified bit in the specified bitmap. The bitmap may have been declared using **CPA_BITMAP**. Returns a Boolean (true if the bit is set, false otherwise).

#define CPA_BITMAP_BIT_SET (bitmask,
bit)

File: cpa_types.h

Set a specified bit in the specified bitmap. The bitmap may have been declared using **CPA_BITMAP**.

#define CPA_BITMAP_BIT_CLEAR (bitmask,
bit)

Clear a specified bit in the specified bitmap. The bitmap may have been declared using **CPA_BITMAP**.

#define **CPA_DEPRECATED**

Declare a function or type and mark it as deprecated so that usages get flagged with a warning.

4.6 Typedef Documentation

typedef uint8_t **Cpa8U**

File: cpa_types.h

Unsigned byte base type.

typedef int8_t **Cpa8S**

File: cpa_types.h

Signed byte base type.

typedef uint16_t **Cpa16U**

File: cpa_types.h

Unsigned double-byte base type.

typedef int16_t **Cpa16S**

File: cpa_types.h

Signed double-byte base type.

typedef uint32_t **Cpa32U**

File: cpa_types.h

Unsigned quad-byte base type.

typedef int32_t **Cpa32S**

File: cpa_types.h

Signed quad-byte base type.

typedef uint64_t **Cpa64U**

File: cpa_types.h

Unsigned double-quad-byte base type.

typedef int64_t **Cpa64S**

File: cpa_types.h

Signed double-quad-byte base type.

typedef enum **_CpaBoolean CpaBoolean**

Boolean type.

Functions in this API use this type for Boolean variables that take true or false values.

4.7 Enumeration Type Documentation

enum **_CpaBoolean**

Boolean type.

Functions in this API use this type for Boolean variables that take true or false values.

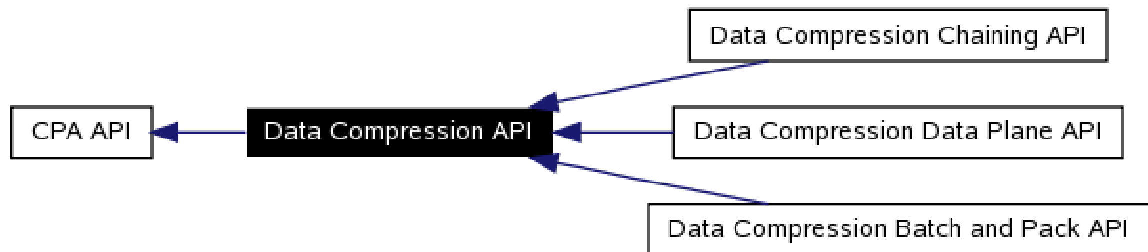
Enumerator:

CPA_FALSE	False value
CPA_TRUE	True value

5 Data Compression API

[CPA API]

Collaboration diagram for Data Compression API:



5.1 Detailed Description

File: cpa_dc.h

These functions specify the API for Data Compression operations.

Remarks:

5.2 Modules

- **Data Compression Batch and Pack API**
- **Data Compression Chaining API**
- **Data Compression Data Plane API**

5.3 Data Structures

- struct **_CpaDcInstanceCapabilities**
- struct **_CpaDcSessionSetupData**
- struct **_CpaDcSessionUpdateData**
- struct **_CpaDcStats**
- struct **_CpaDcRqResults**
- struct **_CpaIntegrityCrc**
- struct **_CpaCrcData**
- struct **_CpaDcSkipData**
- struct **_CpaDcOpData**

5.4 Defines

- #define **CPA_DC_API_VERSION_NUM_MAJOR**
- #define **CPA_DC_API_VERSION_NUM_MINOR**
- #define **CPA_DC_CHAIN_CAP_BITMAP_SIZE**
- #define **CPA_DC_BAD_DATA**

5.5 Typedefs

- typedef void * **CpaDcSessionHandle**
- typedef enum **_CpaDcFileType CpaDcFileType**
- typedef enum **_CpaDcFlush CpaDcFlush**
- typedef enum **_CpaDcHuffType CpaDcHuffType**
- typedef enum **_CpaDcCompType CpaDcCompType**
- typedef enum **_CpaDcChecksum CpaDcChecksum**
- typedef enum **_CpaDcSessionDir CpaDcSessionDir**
- typedef enum **_CpaDcSessionState CpaDcSessionState**
- typedef enum **_CpaDcCompLvl CpaDcCompLvl**
- typedef enum **_CpaDcReqStatus CpaDcReqStatus**
- typedef enum **_CpaDcAutoSelectBest CpaDcAutoSelectBest**
- typedef enum **_CpaDcSkipMode CpaDcSkipMode**
- typedef void(* **CpaDcCallbackFn**)(void *callbackTag, **CpaStatus** status)
- typedef **_CpaDcInstanceCapabilities CpaDcInstanceCapabilities**
- typedef **_CpaDcSessionSetupData CpaDcSessionSetupData**
- typedef **_CpaDcSessionUpdateData CpaDcSessionUpdateData**
- typedef **_CpaDcStats CpaDcStats**
- typedef **_CpaDcRqResults CpaDcRqResults**
- typedef **_CpaIntegrityCrc CpaIntegrityCrc**
- typedef **_CpaCrcData CpaCrcData**
- typedef **_CpaDcSkipData CpaDcSkipData**
- typedef **_CpaDcOpData CpaDcOpData**
- typedef void(* **CpaDcInstanceNotificationCbFunc**)(const **CpaInstanceHandle** instanceHandle, void *pCallbackTag, const **CpaInstanceEvent** instanceEvent)

5.6 Enumerations

- enum **_CpaDcFileType** {
  CPA_DC_FT_ASCII,
  CPA_DC_FT_CSS,
  CPA_DC_FT_HTML,
  CPA_DC_FT_JAVA,
  CPA_DC_FT_OTHER
  }
- enum **_CpaDcFlush** {
  CPA_DC_FLUSH_NONE,
  CPA_DC_FLUSH_FINAL,
  CPA_DC_FLUSH_SYNC,
  CPA_DC_FLUSH_FULL
  }
- enum **_CpaDcHuffType** {
  CPA_DC_HT_STATIC,
  CPA_DC_HT_PRECOMP,
  CPA_DC_HT_FULL_DYNAMIC
  }
- enum **_CpaDcCompType** {
  CPA_DC_LZS,
  CPA_DC_ELZS,
  CPA_DC_LZSS,
  CPA_DC_DEFLATE
  }
- enum **_CpaDcChecksum** {
  CPA_DC_NONE,

CPA_DC_CRC32,
CPA_DC_ADLER32,
CPA_DC_CRC32_ADLER32
}

- enum **_CpaDcSessionDir** {
  CPA_DC_DIR_COMPRESS,
  CPA_DC_DIR_DECOMPRESS,
  CPA_DC_DIR_COMBINED
  }
- enum **_CpaDcSessionState** {
  CPA_DC_STATEFUL,
  CPA_DC_STATELESS
  }
- enum **_CpaDcCompLvl** {
  CPA_DC_L1,
  CPA_DC_L2,
  CPA_DC_L3,
  CPA_DC_L4,
  CPA_DC_L5,
  CPA_DC_L6,
  CPA_DC_L7,
  CPA_DC_L8,
  CPA_DC_L9
  }
- enum **_CpaDcReqStatus** {
  CPA_DC_OK,
  CPA_DC_INVALID_BLOCK_TYPE,
  CPA_DC_BAD_STORED_BLOCK_LEN,
  CPA_DC_TOO_MANY_CODES,
  CPA_DC_INCOMPLETE_CODE_LENS,
  CPA_DC_REPEATED_LENS,
  CPA_DC_MORE_REPEAT,
  CPA_DC_BAD_LITLEN_CODES,
  CPA_DC_BAD_DIST_CODES,
  CPA_DC_INVALID_CODE,
  CPA_DC_INVALID_DIST,
  CPA_DC_OVERFLOW,
  CPA_DC_SOFTERR,
  CPA_DC_FATALERR,
  CPA_DC_MAX_RESUBITERR,
  CPA_DC_INCOMPLETE_FILE_ERR,
  CPA_DC_WDOG_TIMER_ERR,
  CPA_DC_EP_HARDWARE_ERR,
  CPA_DC_VERIFY_ERROR,
  CPA_DC_EMPTY_DYM_BLK,
  CPA_DC_CRC_INTEG_ERR
  }
- enum **_CpaDcAutoSelectBest** {
  CPA_DC_ASB_DISABLED,
  CPA_DC_ASB_STATIC_DYNAMIC,
  CPA_DC_ASB_UNCOMP_STATIC_DYNAMIC_WITH_STORED_HDRS,
  CPA_DC_ASB_UNCOMP_STATIC_DYNAMIC_WITH_NO_HDRS
  }
- enum **_CpaDcSkipMode** {
  CPA_DC_SKIP_DISABLED,
  CPA_DC_SKIP_AT_START,

CPA_DC_SKIP_AT_END,
CPA_DC_SKIP_STRIDE
}

5.7 Functions

- **CpaStatus cpaDcQueryCapabilities** (**CpaInstanceHandle** dcInstance, **CpaDcInstanceCapabilities** *pInstanceCapabilities)
- **CpaStatus cpaDcInitSession** (**CpaInstanceHandle** dcInstance, **CpaDcSessionHandle** pSessionHandle, **CpaDcSessionSetupData** *pSessionData, **CpaBufferList** *pContextBuffer, **CpaDcCallbackFn** callbackFn)
- **CpaStatus cpaDcResetSession** (const **CpaInstanceHandle** dcInstance, **CpaDcSessionHandle** pSessionHandle)
- **CpaStatus cpaDcUpdateSession** (const **CpaInstanceHandle** dcInstance, **CpaDcSessionHandle** pSessionHandle, **CpaDcSessionUpdateData** *pSessionUpdateData)
- **CpaStatus cpaDcRemoveSession** (const **CpaInstanceHandle** dcInstance, **CpaDcSessionHandle** pSessionHandle)
- **CpaStatus cpaDcDeflateCompressBound** (const **CpaInstanceHandle** dcInstance, **CpaDcHuffType** huffType, **Cpa32U** inputSize, **Cpa32U** *outputSize)
- **CpaStatus cpaDcCompressData** (**CpaInstanceHandle** dcInstance, **CpaDcSessionHandle** pSessionHandle, **CpaBufferList** *pSrcBuff, **CpaBufferList** *pDestBuff, **CpaDcRqResults** *pResults, **CpaDcFlush** flushFlag, void *callbackTag)
- **CpaStatus cpaDcCompressData2** (**CpaInstanceHandle** dcInstance, **CpaDcSessionHandle** pSessionHandle, **CpaBufferList** *pSrcBuff, **CpaBufferList** *pDestBuff, **CpaDcOpData** *pOpData, **CpaDcRqResults** *pResults, void *callbackTag)
- **CpaStatus cpaDcDecompressData** (**CpaInstanceHandle** dcInstance, **CpaDcSessionHandle** pSessionHandle, **CpaBufferList** *pSrcBuff, **CpaBufferList** *pDestBuff, **CpaDcRqResults** *pResults, **CpaDcFlush** flushFlag, void *callbackTag)
- **CpaStatus cpaDcDecompressData2** (**CpaInstanceHandle** dcInstance, **CpaDcSessionHandle** pSessionHandle, **CpaBufferList** *pSrcBuff, **CpaBufferList** *pDestBuff, **CpaDcOpData** *pOpData, **CpaDcRqResults** *pResults, void *callbackTag)
- **CpaStatus cpaDcGenerateHeader** (**CpaDcSessionHandle** pSessionHandle, **CpaFlatBuffer** *pDestBuff, **Cpa32U** *count)
- **CpaStatus cpaDcGenerateFooter** (**CpaDcSessionHandle** pSessionHandle, **CpaFlatBuffer** *pDestBuff, **CpaDcRqResults** *pResults)
- **CpaStatus cpaDcGetStats** (**CpaInstanceHandle** dcInstance, **CpaDcStats** *pStatistics)
- **CpaStatus cpaDcGetNumInstances** (**Cpa16U** *pNumInstances)
- **CpaStatus cpaDcGetInstances** (**Cpa16U** numInstances, **CpaInstanceHandle** *dcInstances)
- **CpaStatus cpaDcGetNumIntermediateBuffers** (**CpaInstanceHandle** instanceHandle, **Cpa16U** *pNumBuffers)
- **CpaStatus cpaDcStartInstance** (**CpaInstanceHandle** instanceHandle, **Cpa16U** numBuffers, **CpaBufferList** **pIntermediateBuffers)
- **CpaStatus cpaDcStopInstance** (**CpaInstanceHandle** instanceHandle)
- **CpaStatus cpaDcInstanceGetInfo2** (const **CpaInstanceHandle** instanceHandle, **CpaInstanceInfo2** *pInstanceInfo2)
- **CpaStatus cpaDcInstanceSetNotificationCb** (const **CpaInstanceHandle** instanceHandle, const **CpaDcInstanceNotificationCbFunc** pInstanceNotificationCb, void *pCallbackTag)
- **CpaStatus cpaDcGetSessionSize** (**CpaInstanceHandle** dcInstance, **CpaDcSessionSetupData** *pSessionData, **Cpa32U** *pSessionSize, **Cpa32U** *pContextSize)
- **CpaStatus cpaDcBufferListGetMetaSize** (const **CpaInstanceHandle** instanceHandle, **Cpa32U** numBuffers, **Cpa32U** *pSizeInBytes)
- **CpaStatus cpaDcGetStatusText** (const **CpaInstanceHandle** dcInstance, const **CpaStatus** errStatus, **Cpa8S** *pStatusText)
- **CpaStatus cpaDcSetAddressTranslation** (const **CpaInstanceHandle** instanceHandle, **CpaVirtualToPhysical** virtual2Physical)

- **CpaStatus cpaDcDpGetSessionSize** (**CpaInstanceHandle** dcInstance, **CpaDcSessionSetupData** *pSessionData, **Cpa32U** *pSessionSize)
- **CpaStatus cpaDcDpUpdateSession** (const **CpaInstanceHandle** dcInstance, **CpaDcSessionHandle** pSessionHandle, **CpaDcSessionUpdateData** *pSessionUpdateData)
- **CpaStatus cpaDcDpRemoveSession** (const **CpaInstanceHandle** dcInstance, **CpaDcSessionHandle** pSessionHandle)

5.8 Data Structure Documentation

5.8.1 _CpaDcInstanceCapabilities Struct Reference

5.8.1.1 Detailed Description

Implementation Capabilities Structure

This structure contains data relating to the capabilities of an implementation. The capabilities include supported compression algorithms, RFC 1951 options and whether the implementation supports both stateful and stateless compress and decompress sessions.

5.8.1.2 Public Member Functions

- **CPA_BITMAP** (dcChainCapInfo, CPA_DC_CHAIN_CAP_BITMAP_SIZE)

5.8.1.3 Data Fields

- **CpaBoolean statefulLZSCompression**
- **CpaBoolean statefulLZSDecompression**
- **CpaBoolean statelessLZSCompression**
- **CpaBoolean statelessLZSDecompression**
- **CpaBoolean statefulLZSSCompression**
- **CpaBoolean statefulLZSSDecompression**
- **CpaBoolean statelessLZSSCompression**
- **CpaBoolean statelessLZSSDecompression**
- **CpaBoolean statefulELZSCompression**
- **CpaBoolean statefulELZSDecompression**
- **CpaBoolean statelessELZSCompression**
- **CpaBoolean statelessELZSDecompression**
- **CpaBoolean statefulDeflateCompression**
- **CpaBoolean statefulDeflateDecompression**
- **CpaBoolean statelessDeflateCompression**
- **CpaBoolean statelessDeflateDecompression**
- **CpaBoolean checksumCRC32**
- **CpaBoolean checksumAdler32**
- **CpaBoolean dynamicHuffman**
- **CpaBoolean dynamicHuffmanBufferReq**
- **CpaBoolean precompiledHuffman**
- **CpaBoolean autoSelectBestHuffmanTree**
- **Cpa8U validWindowSizeMaskCompression**
- **Cpa8U validWindowSizeMaskDecompression**
- **Cpa32U internalHuffmanMem**
- **CpaBoolean endOfLastBlock**
- **CpaBoolean reportParityError**
- **CpaBoolean batchAndPack**
- **CpaBoolean compressAndVerify**

- **CpaBoolean compressAndVerifyStrict**
- **CpaBoolean compressAndVerifyAndRecover**
- **CpaBoolean integrityCrcs**

5.8.1.4 Member Function Documentation

```
_CpaDcInstanceCapabilities::CPA_BITMAP( dcChainCapInfo                ,
                                        CPA_DC_CHAIN_CAP_BITMAP_SIZE
                                      )
```

Bitmap representing which chaining capabilities are supported by the instance. Bits can be tested using the macro **CPA_BITMAP_BIT_TEST**. The bit positions are those specified in the enumerated type CpaDcChainCapabilities in **cpa_dc_chain.h**.

5.8.1.5 Field Documentation

CpaBoolean _CpaDcInstanceCapabilities::statefulLZSCompression

True if the Instance supports Stateful LZS compression

CpaBoolean _CpaDcInstanceCapabilities::statefulLZSDecompression

True if the Instance supports Stateful LZS decompression

CpaBoolean _CpaDcInstanceCapabilities::statelessLZSCompression

True if the Instance supports Stateless LZS compression

CpaBoolean _CpaDcInstanceCapabilities::statelessLZSDecompression

True if the Instance supports Stateless LZS decompression

CpaBoolean _CpaDcInstanceCapabilities::statefulLZSSCompression

True if the Instance supports Stateful LZSS compression

CpaBoolean _CpaDcInstanceCapabilities::statefulLZSSDecompression

True if the Instance supports Stateful LZSS decompression

CpaBoolean _CpaDcInstanceCapabilities::statelessLZSSCompression

True if the Instance supports Stateless LZSS compression

CpaBoolean _CpaDcInstanceCapabilities::statelessLZSSDecompression

True if the Instance supports Stateless LZSS decompression

CpaBoolean _CpaDcInstanceCapabilities::statefulELZSCompression

True if the Instance supports Stateful Extended LZS compression

CpaBoolean _CpaDcInstanceCapabilities::statefulELZSDecompression

True if the Instance supports Stateful Extended LZS decompression

CpaBoolean _CpaDcInstanceCapabilities::statelessELZSCompression

True if the Instance supports Stateless Extended LZS compression

CpaBoolean _CpaDcInstanceCapabilities::statelessELZSDecompression

True if the Instance supports Stateless Extended LZS decompression

CpaBoolean _CpaDcInstanceCapabilities::statefulDeflateCompression

True if the Instance supports Stateful Deflate compression

CpaBoolean _CpaDcInstanceCapabilities::statefulDeflateDecompression

True if the Instance supports Stateful Deflate decompression

CpaBoolean _CpaDcInstanceCapabilities::statelessDeflateCompression

True if the Instance supports Stateless Deflate compression

CpaBoolean _CpaDcInstanceCapabilities::statelessDeflateDecompression

True if the Instance supports Stateless Deflate decompression

CpaBoolean _CpaDcInstanceCapabilities::checksumCRC32

True if the Instance can calculate a CRC32 checksum over the uncompressed data

CpaBoolean _CpaDcInstanceCapabilities::checksumAdler32

True if the Instance can calculate an Adler-32 checksum over the uncompressed data

CpaBoolean _CpaDcInstanceCapabilities::dynamicHuffman

True if the Instance supports dynamic Huffman trees in deflate blocks

CpaBoolean _CpaDcInstanceCapabilities::dynamicHuffmanBufferReq

True if an Instance specific buffer is required to perform a dynamic Huffman tree deflate request

CpaBoolean _CpaDcInstanceCapabilities::precompiledHuffman

True if the Instance supports precompiled Huffman trees in deflate blocks

CpaBoolean _CpaDcInstanceCapabilities::autoSelectBestHuffmanTree

True if the Instance has the ability to automatically select between different Huffman encoding schemes for better compression ratios

Cpa8U _CpaDcInstanceCapabilities::validWindowSizeMaskCompression

Bits set to '1' for each valid window size supported by the compression implementation

Cpa8U _CpaDcInstanceCapabilities::validWindowSizeMaskDecompression

Bits set to '1' for each valid window size supported by the decompression implementation

Cpa32U _CpaDcInstanceCapabilities::internalHuffmanMem

Number of bytes internally available to be used when constructing dynamic Huffman trees.

CpaBoolean _CpaDcInstanceCapabilities::endOfLastBlock

True if the Instance supports stopping at the end of the last block in a deflate stream during a decompression operation and reporting that the end of the last block has been reached as part of the CpaDcReqStatus data.

CpaBoolean _CpaDcInstanceCapabilities::reportParityError

True if the instance supports parity error reporting.

CpaBoolean _CpaDcInstanceCapabilities::batchAndPack

True if the instance supports 'batch and pack' compression

CpaBoolean _CpaDcInstanceCapabilities::compressAndVerify

True if the instance supports checking that compressed data, generated as part of a compression operation, can be successfully decompressed.

CpaBoolean _CpaDcInstanceCapabilities::compressAndVerifyStrict

True if compressAndVerify is 'strictly' enabled for the instance. If strictly enabled, compressAndVerify will be enabled by default for compression operations and cannot be disabled by setting opData.compressAndVerify=0 with **cpaDcCompressData2()**. Compression operations with opData.compressAndVerify=0 will return a CPA_STATUS_INVALID_PARAM error status when in compressAndVerify strict mode.

CpaBoolean _CpaDcInstanceCapabilities::compressAndVerifyAndRecover

True if the instance supports recovering from errors detected by compressAndVerify by generating a stored block in the compressed output data buffer. This stored block replaces any compressed content that resulted in a compressAndVerify error.

CpaBoolean _CpaDcInstanceCapabilities::integrityCrcs

True if the instance supports integrity CRC checking in the compression/decompression datapath.

5.8.2 _CpaDcSessionSetupData Struct Reference

5.8.2.1 Detailed Description

Session Setup Data.

This structure contains data relating to setting up a session. The client needs to complete the information in this structure in order to setup a session.

Deprecated:

As of v1.6 of the Compression API, the fileType and deflateWindowSize fields in this structure have been deprecated and should not be used.

5.8.2.2 Data Fields

- **CpaDcCompLvl compLevel**
- **CpaDcCompType compType**
- **CpaDcHuffType huffType**
- **CpaDcAutoSelectBest autoSelectBestHuffmanTree**
- **CpaDcFileType fileType**
- **CpaDcSessionDir sessDirection**
- **CpaDcSessionState sessState**
- **Cpa32U deflateWindowSize**
- **CpaDcChecksum checksum**

5.8.2.3 Field Documentation

CpaDcCompLvl _CpaDcSessionSetupData::compLevel

Compression Level from CpaDcCompLvl

CpaDcCompType _CpaDcSessionSetupData::compType

Compression type from CpaDcCompType

CpaDcHuffType _CpaDcSessionSetupData::huffType

Huffman type from CpaDcHuffType

CpaDcAutoSelectBest _CpaDcSessionSetupData::autoSelectBestHuffmanTree

Indicates if and how the implementation should select the best Huffman encoding.

CpaDcFileType _CpaDcSessionSetupData::fileType

File type for the purpose of determining Huffman Codes from CpaDcFileType. As of v1.6 of the Compression API, this field has been deprecated and should not be used.

CpaDcSessionDir _CpaDcSessionSetupData::sessDirection

Session direction indicating whether session is used for compression, decompression or both

CpaDcSessionState _CpaDcSessionSetupData::sessState

Session state indicating whether the session should be configured as stateless or stateful

Cpa32U _CpaDcSessionSetupData::deflateWindowSize

Base 2 logarithm of maximum window size minus 8 (a value of 7 for a 32K window size). Permitted values are 0 to 7. cpaDcDecompressData may return an error if an attempt is made to decompress a stream that has a larger window size. As of v1.6 of the Compression API, this field has been deprecated and should not be used.

CpaDcChecksum _CpaDcSessionSetupData::checksum

Desired checksum required for the session

5.8.3 _CpaDcSessionUpdateData Struct Reference

5.8.3.1 Detailed Description

Session Update Data.

This structure contains data relating to updating up a session. The client needs to complete the information in this structure in order to update a session.

5.8.3.2 Data Fields

- **CpaDcCompLvl compLevel**
- **CpaDcHuffType huffType**
- **CpaBoolean enableDmm**

5.8.3.3 Field Documentation

CpaDcCompLvl _CpaDcSessionUpdateData::compLevel

Compression Level from CpaDcCompLvl

CpaDcHuffType _CpaDcSessionUpdateData::huffType

Huffman type from CpaDcHuffType

CpaBoolean _CpaDcSessionUpdateData::enableDmm

Desired DMM required for the session

5.8.4 _CpaDcStats Struct Reference

5.8.4.1 Detailed Description

Compression Statistics Data.

This structure contains data elements corresponding to statistics. Statistics are collected on a per instance basis and include: jobs submitted and completed for both compression and decompression.

5.8.4.2 Data Fields

- **Cpa64U numCompRequests**
- **Cpa64U numCompRequestsErrors**
- **Cpa64U numCompCompleted**
- **Cpa64U numCompCompletedErrors**
- **Cpa64U numCompCnvErrorsRecovered**
- **Cpa64U numDecompRequests**
- **Cpa64U numDecompRequestsErrors**
- **Cpa64U numDecompCompleted**
- **Cpa64U numDecompCompletedErrors**

5.8.4.3 Field Documentation

Cpa64U _CpaDcStats::numCompRequests

Number of successful compression requests

Cpa64U _CpaDcStats::numCompRequestsErrors

Number of compression requests that had errors and could not be processed

Cpa64U _CpaDcStats::numCompCompleted

Compression requests completed

Cpa64U _CpaDcStats::numCompCompletedErrors

Compression requests not completed due to errors

Cpa64U _CpaDcStats::numCompCnvErrorsRecovered

Compression CNV errors that have been recovered

Cpa64U _CpaDcStats::numDecompRequests

Number of successful decompression requests

Cpa64U _CpaDcStats::numDecompRequestsErrors

Number of decompression requests that had errors and could not be processed

Cpa64U _CpaDcStats::numDecompCompleted

Decompression requests completed

Cpa64U _CpaDcStats::numDecompCompletedErrors

Decompression requests not completed due to errors

5.8.5 _CpaDcRqResults Struct Reference

5.8.5.1 Detailed Description

Request results data

This structure contains the request results.

For stateful sessions the status, produced, consumed and endOfLastBlock results are per request values while the checksum value is cumulative across all requests on the session so far. In this case the checksum value is not guaranteed to be correct until the final compressed data has been processed.

For stateless sessions, an initial checksum value is passed into the stateless operation. Once the stateless operation completes, the checksum value will contain checksum produced by the operation.

5.8.5.2 Data Fields

- **CpaDcReqStatus status**
- **Cpa32U produced**
- **Cpa32U consumed**
- **Cpa32U checksum**
- **CpaBoolean endOfLastBlock**

5.8.5.3 Field Documentation

CpaDcReqStatus _CpaDcRqResults::status

Additional status details from accelerator

Cpa32U _CpaDcRqResults::produced

Octets produced by the operation

Cpa32U _CpaDcRqResults::consumed

Octets consumed by the operation

Cpa32U _CpaDcRqResults::checksum

Initial checksum passed into stateless operations. Will also be updated to the checksum produced by the operation

CpaBoolean _CpaDcRqResults::endOfLastBlock

Decompression operation has stopped at the end of the last block in a deflate stream.

5.8.6 _CpaIntegrityCrc Struct Reference

5.8.6.1 Detailed Description

Integrity CRC calculation details

This structure contains information about resulting integrity CRC calculations performed for a single request.

5.8.6.2 Data Fields

- **Cpa32U iCrc**
- **Cpa32U oCrc**

5.8.6.3 Field Documentation

Cpa32U _CpaIntegrityCrc::iCrc

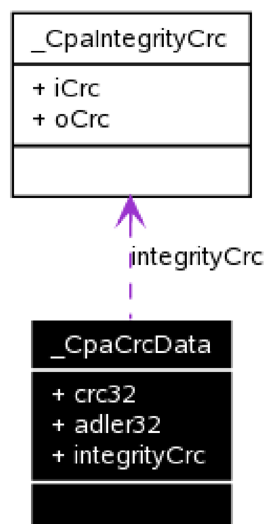
CRC calculated on request's input buffer

Cpa32U _CpaIntegrityCrc::oCrc

CRC calculated on request's output buffer

5.8.7 _CpaCrcData Struct Reference

Collaboration diagram for _CpaCrcData:



5.8.7.1 Detailed Description

Collection of CRC related data

This structure contains data facilitating CRC calculations. After successful request, this structure will contain all resulting CRCs. Integrity specific CRCs (when enabled/supported) are located in 'CpaIntegrityCrc integrityCrc' field.

Note:

this structure must be allocated in physical contiguous memory

5.8.7.2 Data Fields

- **Cpa32U crc32**
- **Cpa32U adler32**
- **CpaIntegrityCrc integrityCrc**

5.8.7.3 Field Documentation

Cpa32U _CpaCrcData::crc32

CRC32 calculated on the input buffer during compression requests and on the output buffer during decompression requests.

Cpa32U _CpaCrcData::adler32

ADLER32 calculated on the input buffer during compression requests and on the output buffer during decompression requests.

CpaIntegrityCrc _CpaCrcData::integrityCrc

Integrity CRCs

5.8.8 _CpaDcSkipData Struct Reference

5.8.8.1 Detailed Description

Skip Region Data.

This structure contains data relating to configuring skip region behaviour. A skip region is a region of an input buffer that should be omitted from processing or a region that should be inserted into the output buffer.

5.8.8.2 Data Fields

- **CpaDcSkipMode skipMode**
- **Cpa32U skipLength**
- **Cpa32U strideLength**
- **Cpa32U firstSkipOffset**

5.8.8.3 Field Documentation

CpaDcSkipMode _CpaDcSkipData::skipMode

Skip mode from CpaDcSkipMode for buffer processing

Cpa32U _CpaDcSkipData::skipLength

Number of bytes to skip when skip mode is enabled

Cpa32U _CpaDcSkipData::strideLength

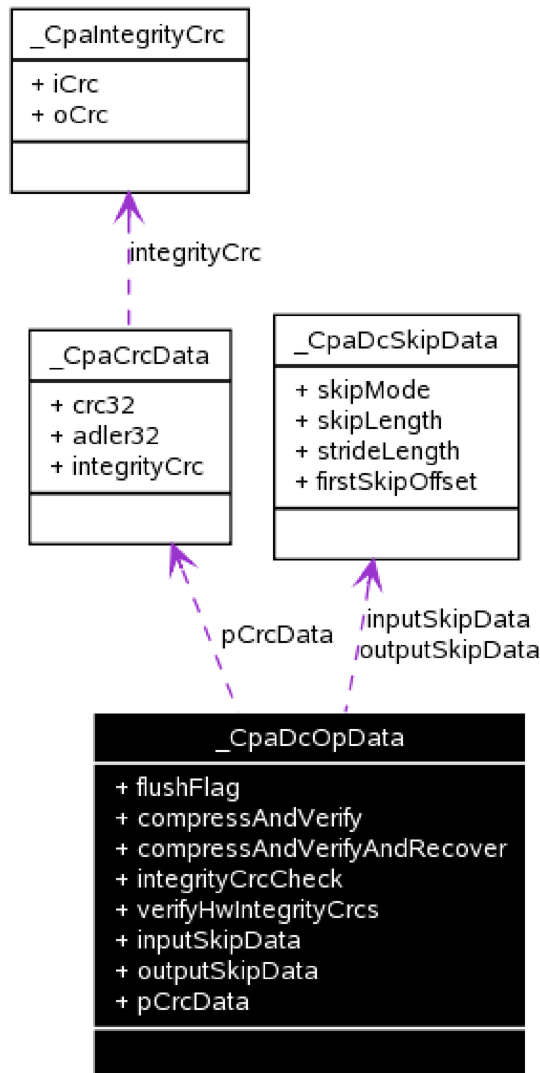
Size of the stride between skip regions when skip mode is set to CPA_DC_SKIP_STRIDE.

Cpa32U _CpaDcSkipData::firstSkipOffset

Number of bytes to skip in a buffer before reading/writing the input/output data.

5.8.9 _CpaDcOpData Struct Reference

Collaboration diagram for _CpaDcOpData:



5.8.9.1 Detailed Description

(De)Compression request input parameters.

This structure contains the request information for use with compression operations.

5.8.9.2 Data Fields

- **CpaDcFlush flushFlag**
- **CpaBoolean compressAndVerify**
- **CpaBoolean compressAndVerifyAndRecover**
- **CpaBoolean integrityCrcCheck**
- **CpaBoolean verifyHwIntegrityCrcs**
- **CpaDcSkipData inputSkipData**
- **CpaDcSkipData outputSkipData**
- **CpaCrcData * pCrcData**

5.8.9.3 Field Documentation

CpaDcFlush _CpaDcOpData::flushFlag

Indicates the type of flush to be performed.

CpaBoolean _CpaDcOpData::compressAndVerify

If set to true, for compression operations, the implementation will verify that compressed data, generated by the compression operation, can be successfully decompressed. This behavior is only supported for stateless compression. This behavior is only supported on instances that support the compressAndVerify capability.

CpaBoolean _CpaDcOpData::compressAndVerifyAndRecover

If set to true, for compression operations, the implementation will automatically recover from a compressAndVerify error. This behavior is only supported for stateless compression. This behavior is only supported on instances that support the compressAndVerifyAndRecover capability. The compressAndVerify field in CpaDcOpData MUST be set to CPA_TRUE if compressAndVerifyAndRecover is set to CPA_TRUE.

CpaBoolean _CpaDcOpData::integrityCrcCheck

If set to true, the implementation will verify that data integrity is preserved through the processing pipeline. This behaviour supports stateless and stateful behavior for both static and dynamic Huffman encoding.

Integrity CRC checking is not supported for decompression operations over data that contains multiple gzip headers.

CpaBoolean _CpaDcOpData::verifyHwIntegrityCrcs

If set to true, software calculated CRCs will be compared against hardware generated integrity CRCs to ensure that data integrity is maintained when transferring data to and from the hardware accelerator.

CpaDcSkipData _CpaDcOpData::inputSkipData

Optional skip regions in the input buffers

CpaDcSkipData _CpaDcOpData::outputSkipData

Optional skip regions in the output buffers

CpaCrcData* _CpaDcOpData::pCrcData

Pointer to CRCs for this operation, when integrity checks are enabled.

5.9 Define Documentation

#define CPA_DC_API_VERSION_NUM_MAJOR

CPA Dc Major Version Number

The CPA_DC API major version number. This number will be incremented when significant churn to the API has occurred. The combination of the major and minor number definitions represent the complete version number for this interface.

#define CPA_DC_API_VERSION_NUM_MINOR

CPA DC Minor Version Number

The CPA_DC API minor version number. This number will be incremented when minor changes to the API has occurred. The combination of the major and minor number definitions represent the complete version number for this interface.

#define CPA_DC_CHAIN_CAP_BITMAP_SIZE

Size of bitmap needed for compression chaining capabilities.

Defines the number of bits in the bitmap to represent supported chaining capabilities dcChainCapInfo. Should be set to at least one greater than the largest value in the enumerated type **CpaDcChainOperations**, so that the value of the enum constant can also be used as the bit position in the bitmap.

A larger value was chosen to allow for extensibility without the need to change the size of the bitmap (to ease backwards compatibility in future versions of the API).

#define CPA_DC_BAD_DATA

Service specific return codes

Compression specific return codesInput data in invalid

5.10 Typedef Documentation

typedef void* **CpaDcSessionHandle**

Compression API session handle type

Handle used to uniquely identify a Compression API session handle. This handle is established upon registration with the API using **cpaDcInitSession()**.

typedef enum **_CpaDcFileType CpaDcFileType**

Supported file types

This enumerated lists identified file types. Used to select Huffman trees. File types are associated with Precompiled Huffman Trees.

Deprecated:

As of v1.6 of the Compression API, this enum has been deprecated.

typedef enum **_CpaDcFlush CpaDcFlush**

Supported flush flags

This enumerated list identifies the types of flush that can be specified for stateful and stateless cpaDcCompressData and cpaDcDecompressData functions.

typedef enum **_CpaDcHuffType CpaDcHuffType**

Supported Huffman Tree types

This enumeration lists support for Huffman Tree types. Selecting Static Huffman trees generates compressed blocks with an RFC 1951 header specifying "compressed with fixed Huffman trees".

Selecting Full Dynamic Huffman trees generates compressed blocks with an RFC 1951 header specifying "compressed with dynamic Huffman codes". The headers are calculated on the data being compressed, requiring two passes.

Selecting Precompiled Huffman Trees generates blocks with RFC 1951 dynamic headers. The headers are pre-calculated and are specified by the file type.

typedef enum **_CpaDcCompType CpaDcCompType**

Supported compression types

This enumeration lists the supported data compression algorithms. In combination with CpaDcChecksum it is used to decide on the file header and footer format.

Deprecated:

As of v1.6 of the Compression API, CPA_DC_LZS, CPA_DC_ELZS and CPA_DC_LZSS have been deprecated and should not be used.

typedef enum **_CpaDcChecksum CpaDcChecksum**

Supported checksum algorithms

This enumeration lists the supported checksum algorithms Used to decide on file header and footer specifics.

typedef enum **_CpaDcSessionDir CpaDcSessionDir**

Supported session directions

This enumerated list identifies the direction of a session. A session can be compress, decompress or both.

typedef enum **_CpaDcSessionState CpaDcSessionState**

Supported session state settings

This enumerated list identifies the stateful setting of a session. A session can be either stateful or stateless.

Stateful sessions are limited to have only one in-flight message per session. This means a compress or decompress request must be complete before a new request can be started. This applies equally to sessions that are uni-directional in nature and sessions that are combined compress and decompress. Completion occurs when the synchronous function returns, or when the asynchronous callback function has completed.

typedef enum **_CpaDcCompLvl CpaDcCompLvl**

Supported compression levels

This enumerated lists the supported compressed levels. Lower values will result in less compressibility in less time.

typedef enum **_CpaDcReqStatus CpaDcReqStatus**

Supported additional details from accelerator

This enumeration lists the supported additional details from the accelerator. These may be useful in determining the best way to recover from a failure.

typedef enum **_CpaDcAutoSelectBest CpaDcAutoSelectBest**

Supported modes for automatically selecting the best compression type.

This enumeration lists the supported modes for automatically selecting the best Huffman encoding which would lead to the best compression results.

The CPA_DC_ASB_UNCOMP_STATIC_DYNAMIC_WITH_NO_HDRS value is deprecated and should not be used.

typedef enum **_CpaDcSkipMode CpaDcSkipMode**

Supported modes for skipping regions of input or output buffers.

This enumeration lists the supported modes for skipping regions of input or output buffers.

typedef void(* **CpaDcCallbackFn**)(void *callbackTag, **CpaStatus** status)

Definition of callback function invoked for asynchronous cpaDc requests.

This is the prototype for the cpaDc compression callback functions. The callback function is registered by the application using the **cpaDcInitSession()** function call.

Context:
This callback function can be executed in a context that DOES NOT permit sleeping to occur.

Assumptions:
None

Side-Effects:
None

Reentrant:
No

Thread-safe:
Yes

Parameters:

callbackTag	User-supplied value to help identify request.
status	Status of the operation. Valid values are CPA_STATUS_SUCCESS, CPA_STATUS_FAIL and CPA_STATUS_UNSUPPORTED.

Return values:
None

Precondition:
Component has been initialized.

Postcondition:
None

Note:
None

See also:
None

typedef struct **_CpaDcInstanceCapabilities CpaDcInstanceCapabilities**

Implementation Capabilities Structure

This structure contains data relating to the capabilities of an implementation. The capabilities include supported compression algorithms, RFC 1951 options and whether the implementation supports both stateful and stateless compress and decompress sessions.

typedef struct **_CpaDcSessionSetupData CpaDcSessionSetupData**

Session Setup Data.

This structure contains data relating to setting up a session. The client needs to complete the information in this structure in order to setup a session.

Deprecated:
As of v1.6 of the Compression API, the fileType and deflateWindowSize fields in this structure have been deprecated and should not be used.

typedef struct **_CpaDcSessionUpdateData CpaDcSessionUpdateData**

Session Update Data.

This structure contains data relating to updating up a session. The client needs to complete the information in this structure in order to update a session.

typedef struct **_CpaDcStats CpaDcStats**

Compression Statistics Data.

This structure contains data elements corresponding to statistics. Statistics are collected on a per instance basis and include: jobs submitted and completed for both compression and decompression.

typedef struct **_CpaDcRqResults CpaDcRqResults**

Request results data

This structure contains the request results.

For stateful sessions the status, produced, consumed and endOfLastBlock results are per request values while the checksum value is cumulative across all requests on the session so far. In this case the checksum value is not guaranteed to be correct until the final compressed data has been processed.

For stateless sessions, an initial checksum value is passed into the stateless operation. Once the stateless operation completes, the checksum value will contain checksum produced by the operation.

typedef struct **_CpaIntegrityCrc CpaIntegrityCrc**

Integrity CRC calculation details

This structure contains information about resulting integrity CRC calculations performed for a single request.

typedef struct **_CpaCrcData CpaCrcData**

Collection of CRC related data

This structure contains data facilitating CRC calculations. After successful request, this structure will contain all resulting CRCs. Integrity specific CRCs (when enabled/supported) are located in 'CpaIntegrityCrc integrityCrc' field.

Note:
this structure must be allocated in physical contiguous memory

typedef struct **_CpaDcSkipData CpaDcSkipData**

Skip Region Data.

This structure contains data relating to configuring skip region behaviour. A skip region is a region of an input buffer that should be omitted from processing or a region that should be inserted into the output buffer.

typedef struct **_CpaDcOpData CpaDcOpData**

(De)Compression request input parameters.

This structure contains the request information for use with compression operations.

typedef void(* **CpaDcInstanceNotificationCbFunc**)(const **CpaInstanceHandle** instanceHandle, void *pCallbackTag, const **CpaInstanceEvent** instanceEvent)

Callback function for instance notification support.

This is the prototype for the instance notification callback function. The callback function is passed in as a parameter to the **cpaDcInstanceSetNotificationCb** function.

Context:
This function will be executed in a context that requires that sleeping MUST NOT be permitted.

Assumptions:
None

Side-Effects:
None

Blocking:
No

Reentrant:
No

Thread-safe:
Yes

Parameters:

[in]	*instanceHandle*	Instance handle.
[in]	*pCallbackTag*	Opaque value provided by user while making individual function calls.
[in]	*instanceEvent*	The event that will trigger this function to get invoked.

Return values:
None

Precondition:
Component has been initialized and the notification function has been set via the cpaDcInstanceSetNotificationCb function.

Postcondition:
None

Note:
None

See also:
cpaDcInstanceSetNotificationCb(),

5.11 Enumeration Type Documentation

enum **_CpaDcFileType**

Supported file types

This enumerated lists identified file types. Used to select Huffman trees. File types are associated with Precompiled Huffman Trees.

Deprecated:
As of v1.6 of the Compression API, this enum has been deprecated.

Enumerator:

CPA_DC_FT_ASCII	ASCII File Type
CPA_DC_FT_CSS	Cascading Style Sheet File Type
CPA_DC_FT_HTML	HTML or XML (or similar) file type
CPA_DC_FT_JAVA	File Java code or similar
CPA_DC_FT_OTHER	Other file types

enum **_CpaDcFlush**

Supported flush flags

This enumerated list identifies the types of flush that can be specified for stateful and stateless cpaDcCompressData and cpaDcDecompressData functions.

Enumerator:

CPA_DC_FLUSH_NONE	No flush request.
CPA_DC_FLUSH_FINAL	Indicates that the input buffer contains all of the data for the compression session allowing any buffered data to be released. For Deflate, BFINAL is set in the compression header.
CPA_DC_FLUSH_SYNC	Used for stateful deflate compression to indicate that all pending output is flushed, byte aligned, to the output buffer. The session state is not reset.
CPA_DC_FLUSH_FULL	Used for deflate compression to indicate that all pending output is flushed to the output buffer and the session state is reset.

enum **_CpaDcHuffType**

Supported Huffman Tree types

This enumeration lists support for Huffman Tree types. Selecting Static Huffman trees generates compressed blocks with an RFC 1951 header specifying "compressed with fixed Huffman trees".

Selecting Full Dynamic Huffman trees generates compressed blocks with an RFC 1951 header specifying "compressed with dynamic Huffman codes". The headers are calculated on the data being compressed, requiring two passes.

Selecting Precompiled Huffman Trees generates blocks with RFC 1951 dynamic headers. The headers are pre-calculated and are specified by the file type.

Enumerator:

CPA_DC_HT_STATIC	Static Huffman Trees
CPA_DC_HT_PRECOMP	Precompiled Huffman Trees
CPA_DC_HT_FULL_DYNAMIC	Full Dynamic Huffman Trees

enum **_CpaDcCompType**

Supported compression types

This enumeration lists the supported data compression algorithms. In combination with CpaDcChecksum it is used to decide on the file header and footer format.

Deprecated:

As of v1.6 of the Compression API, CPA_DC_LZS, CPA_DC_ELZS and CPA_DC_LZSS have been deprecated and should not be used.

Enumerator:

CPA_DC_LZS	LZS Compression
CPA_DC_ELZS	Extended LZS Compression
CPA_DC_LZSS	LZSS Compression
CPA_DC_DEFLATE	Deflate Compression

enum **_CpaDcChecksum**

Supported checksum algorithms

This enumeration lists the supported checksum algorithms Used to decide on file header and footer specifics.

Enumerator:

CPA_DC_NONE	No checksums required
CPA_DC_CRC32	Application requires a CRC32 checksum
CPA_DC_ADLER32	Application requires Adler-32 checksum
CPA_DC_CRC32_ADLER32	Application requires both CRC32 and Adler-32 checksums

enum **_CpaDcSessionDir**

Supported session directions

This enumerated list identifies the direction of a session. A session can be compress, decompress or both.

Enumerator:

CPA_DC_DIR_COMPRESS	Session will be used for compression
CPA_DC_DIR_DECOMPRESS	Session will be used for decompression
CPA_DC_DIR_COMBINED	Session will be used for both compression and decompression

enum **_CpaDcSessionState**

Supported session state settings

This enumerated list identifies the stateful setting of a session. A session can be either stateful or stateless.

Stateful sessions are limited to have only one in-flight message per session. This means a compress or decompress request must be complete before a new request can be started. This applies equally to sessions that are uni-directional in nature and sessions that are combined compress and decompress. Completion occurs when the synchronous function returns, or when the asynchronous callback function has completed.

Enumerator:

CPA_DC_STATEFUL	Session will be stateful, implying that state may need to be saved in some situations
CPA_DC_STATELESS	Session will be stateless, implying no state will be stored

enum **_CpaDcCompLvl**

Supported compression levels

This enumerated lists the supported compressed levels. Lower values will result in less compressibility in less time.

Enumerator:

CPA_DC_L1	Compression level 1
CPA_DC_L2	Compression level 2
CPA_DC_L3	Compression level 3
CPA_DC_L4	Compression level 4
CPA_DC_L5	Compression level 5
CPA_DC_L6	Compression level 6
CPA_DC_L7	Compression level 7
CPA_DC_L8	Compression level 8
CPA_DC_L9	Compression level 9

enum **_CpaDcReqStatus**

Supported additional details from accelerator

This enumeration lists the supported additional details from the accelerator. These may be useful in determining the best way to recover from a failure.

Enumerator:

CPA_DC_OK	No error detected by compression slice
CPA_DC_INVALID_BLOCK_TYPE	Invalid block type (type == 3)
CPA_DC_BAD_STORED_BLOCK_LEN	Stored block length did not match one's complement
CPA_DC_TOO_MANY_CODES	Too many length or distance codes
CPA_DC_INCOMPLETE_CODE_LENS	Code length codes incomplete
CPA_DC_REPEATED_LENS	Repeated lengths with no first length
CPA_DC_MORE_REPEAT	Repeat more than specified lengths
CPA_DC_BAD_LITLEN_CODES	Invalid literal/length code lengths
CPA_DC_BAD_DIST_CODES	Invalid distance code lengths
CPA_DC_INVALID_CODE	Invalid literal/length or distance code in fixed or dynamic block
CPA_DC_INVALID_DIST	Distance is too far back in fixed or dynamic block
CPA_DC_OVERFLOW	Overflow detected. This is an indication that output buffer has overflowed. For stateful sessions, this is a warning (the input can be adjusted and resubmitted). For stateless sessions this is an error condition
CPA_DC_SOFTERR	Other non-fatal detected
CPA_DC_FATALERR	Fatal error detected
CPA_DC_MAX_RESUBITERR	On an error being detected, the firmware attempted to correct and resubmitted the request, however, the maximum resubmit value was exceeded
CPA_DC_INCOMPLETE_FILE_ERR	The input file is incomplete. Note this is an indication that the request was submitted with a CPA_DC_FLUSH_FINAL, however, a BFINAL bit was not found in the request
CPA_DC_WDOG_TIMER_ERR	The request was not completed as a watchdog timer hardware event occurred
CPA_DC_EP_HARDWARE_ERR	Request was not completed as an end point hardware

	error occurred (for example, a parity error)
CPA_DC_VERIFY_ERROR	Error detected during "compress and verify" operation
CPA_DC_EMPTY_DYM_BLK	Decompression request contained an empty dynamic stored block (not supported)
CPA_DC_CRC_INTEG_ERR	A data integrity CRC error was detected

enum **_CpaDcAutoSelectBest**

Supported modes for automatically selecting the best compression type.

This enumeration lists the supported modes for automatically selecting the best Huffman encoding which would lead to the best compression results.

The CPA_DC_ASB_UNCOMP_STATIC_DYNAMIC_WITH_NO_HDRS value is deprecated and should not be used.

Enumerator:

CPA_DC_ASB_DISABLED	Auto select best mode is disabled
CPA_DC_ASB_STATIC_DYNAMIC	Auto select between static and dynamic compression
CPA_DC_ASB_UNCOMP_STATIC_DYNAMIC_WITH_STORED_HDRS	Auto select between uncompressed, static and dynamic compression, using stored block deflate headers if uncompressed is selected
CPA_DC_ASB_UNCOMP_STATIC_DYNAMIC_WITH_NO_HDRS	Auto select between uncompressed, static and dynamic compression, using no deflate headers if uncompressed is selected

enum **_CpaDcSkipMode**

Supported modes for skipping regions of input or output buffers.

This enumeration lists the supported modes for skipping regions of input or output buffers.

Enumerator:

CPA_DC_SKIP_DISABLED	Skip mode is disabled
CPA_DC_SKIP_AT_START	Skip region is at the start of the buffer.
CPA_DC_SKIP_AT_END	Skip region is at the end of the buffer.
CPA_DC_SKIP_STRIDE	Skip region occurs at regular intervals within the buffer. **CpaDcSkipData.strideLength** specifies the number of bytes between each skip region.

5.12 Function Documentation

CpaStatus cpaDcQueryCapabilities (	**CpaInstanceHandle**	*dcInstance*,
	CpaDcInstanceCapabilities *	*pInstanceCapabilities*
	)	

Retrieve Instance Capabilities

This function is used to retrieve the capabilities matrix of an instance.

Context:
This function shall not be called in an interrupt context.

Assumptions:
None

Side-Effects:
None

Blocking:
Yes

Reentrant:
No

Thread-safe:
Yes

Parameters:

`[in]`	*dcInstance*	Instance handle derived from discovery functions
`[in,out]`	*pInstanceCapabilities*	Pointer to a capabilities struct

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_RESOURCE	Error related to system resources.
CPA_STATUS_RESTARTING	API implementation is restarting. Resubmit the request.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:
None

Postcondition:
None

Note:
Only a synchronous version of this function is provided.

See also:
None

CpaStatus cpaDcInitSession (	**CpaInstanceHandle**	*dcInstance*,
	CpaDcSessionHandle	*pSessionHandle*,
	CpaDcSessionSetupData *	*pSessionData*,
	CpaBufferList *	*pContextBuffer*,
	CpaDcCallbackFn	*callbackFn*
)		

Initialize compression decompression session

This function is used to initialize a compression/decompression session. This function specifies a BufferList for context data. A single session can be used for both compression and decompression requests. Clients MAY register a callback function for the compression service using this function. This function returns a unique session handle each time this function is invoked. If the session has been configured with a callback function, then the order of the callbacks are guaranteed to be in the same order the compression or decompression requests were submitted for each session, so long as a single thread of execution is used for job submission.

Context:
This is a synchronous function and it cannot sleep. It can be executed in a context that does not permit sleeping.

Assumptions:
None

Side-Effects:
None

Blocking:
No

Reentrant:
No

Thread-safe:
Yes

Parameters:

`[in]`	*dcInstance*	Instance handle derived from discovery functions.
`[in,out]`	*pSessionHandle*	Pointer to a session handle.
`[in,out]`	*pSessionData*	Pointer to a user instantiated structure containing session data.
`[in]`	*pContextBuffer*	pointer to context buffer. This is not required for stateless operations. The total size of the buffer list must be equal to or larger than the specified contextSize retrieved from the **cpaDcGetSessionSize()** function.
`[in]`	*callbackFn*	For synchronous operation this callback shall be a null pointer.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_RESOURCE	Error related to system resources.
CPA_STATUS_RESTARTING	API implementation is restarting. Resubmit the request.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:
dcInstance has been started using cpaDcStartInstance.

Postcondition:
None

Note:
Only a synchronous version of this function is provided.

This initializes opaque data structures in the session handle. Data compressed under this session will be compressed to the level specified in the pSessionData structure. Lower compression level numbers indicate a request for faster compression at the expense of compression ratio. Higher compression level numbers indicate a request for higher compression ratios at the expense of execution time.

The session is opaque to the user application and the session handle contains job specific data.

The pointer to the ContextBuffer will be stored in session specific data if required by the implementation.

It is not permitted to have multiple outstanding asynchronous compression requests for stateful sessions. It is possible to add parallelization to compression by using multiple sessions.

The window size specified in the pSessionData must be match exactly one of the supported window sizes specified in the capabilities structure. If a bi-directional session is being initialized, then the window size must be valid for both compress and decompress.

See also:
None

CpaStatus cpaDcResetSession (const **CpaInstanceHandle** *dcInstance*,
CpaDcSessionHandle *pSessionHandle*
)

Compression Session Reset Function.

This function will reset a previously initialized session handle Reset will fail if outstanding calls still exist for the initialized session handle. The client needs to retry the reset function at a later time.

Context:
This is a synchronous function that cannot sleep. It can be executed in a context that does not permit sleeping.

Assumptions:
None

Side-Effects:
None

Blocking:
No.

Reentrant:
No

Thread-safe:
Yes

Parameters:

`[in]`	*dcInstance*	Instance handle.
`[in,out]`	*pSessionHandle*	Session handle.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_RETRY	Resubmit the request.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:
The component has been initialized via cpaDcStartInstance function. The session has been initialized via cpaDcInitSession function.

Postcondition:
None

Note:
This is a synchronous function and has no completion callback associated with it.

See also:
cpaDcInitSession()

CpaStatus cpaDcUpdateSession (const **CpaInstanceHandle** *dcInstance*, **CpaDcSessionHandle** *pSessionHandle*, **CpaDcSessionUpdateData** * *pSessionUpdateData*)

Compression Session Update Function.

This function is used to modify some select compression parameters of a previously initialized session handle. Th update will fail if resources required for the new session settings are not available. Specifically, this function may fail if no intermediate buffers are associated with the instance, and the intended change would require these buffers. This function can be called at any time after a successful call of **cpaDcInitSession()**. This function does not change the parameters to compression request already in flight.

Context:
This is a synchronous function that cannot sleep. It can be executed in a context that does not permit sleeping.

Assumptions:
None

Side-Effects:
None

Blocking:
No.

Reentrant:
No

Thread-safe:
Yes

Parameters:

`[in]`	*dcInstance*	Instance handle.
`[in,out]`	*pSessionHandle*	Session handle.

[in]	*pSessionUpdateData*	Session Data.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_RESOURCE	Error related to system resources.
CPA_STATUS_RESTARTING	API implementation is restarting. Resubmit the request

Precondition:

The component has been initialized via cpaDcStartInstance function. The session has been initialized via cpaDcInitSession function.

Postcondition:

None

Note:

This is a synchronous function and has no completion callback associated with it.

See also:

cpaDcInitSession()

CpaStatus cpaDcRemoveSession (const **CpaInstanceHandle** *dcInstance*, **CpaDcSessionHandle** *pSessionHandle*)

Compression Session Remove Function.

This function will remove a previously initialized session handle and the installed callback handler function. Removal will fail if outstanding calls still exist for the initialized session handle. The client needs to retry the remove function at a later time. The memory for the session handle MUST not be freed until this call has completed successfully.

Context:

This is a synchronous function that cannot sleep. It can be executed in a context that does not permit sleeping.

Assumptions:

None

Side-Effects:

None

Blocking:

No.

Reentrant:

No

Thread-safe:

Yes

Parameters:

[in]	*dcInstance*	Instance handle.
[in,out]	*pSessionHandle*	Session handle.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_RETRY	Resubmit the request.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_RESOURCE	Error related to system resources.
CPA_STATUS_RESTARTING	API implementation is restarting. Resubmit the request.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:
The component has been initialized via cpaDcStartInstance function.

Postcondition:
None

Note:
This is a synchronous function and has no completion callback associated with it.

See also:
cpaDcInitSession()

```
CpaStatus cpaDcDeflateCompressBound ( const CpaInstanceHandle  dcInstance,
                                      CpaDcHuffType            huffType,
                                      Cpa32U                   inputSize,
                                      Cpa32U *                 outputSize
                                    )
```

Deflate Compression Bound API

This function provides the maximum output buffer size for a Deflate compression operation in the "worst case" (non-compressible) scenario. It's primary purpose is for output buffer memory allocation.

Context:
This is a synchronous function that will not sleep. It can be executed in a context that does not permit sleeping.

Assumptions:
None

Side-Effects:
None

Blocking:
No.

Reentrant:
No

Thread-safe:
Yes

Parameters:

[in]	*dcInstance*	Instance handle.
[in]	*huffType*	CpaDcHuffType to be used with this operation.
[in]	*inputSize*	Input Buffer size.
[out]	*outputSize*	Maximum output buffer size.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:
The component has been initialized via cpaDcStartInstance function.

Postcondition:
None

Note:
This is a synchronous function and has no completion callback associated with it.

See also:
None

CpaStatus cpaDcCompressData (**CpaInstanceHandle** *dcInstance*,
CpaDcSessionHandle *pSessionHandle*,
CpaBufferList * *pSrcBuff*,
CpaBufferList * *pDestBuff*,
CpaDcRqResults * *pResults*,
CpaDcFlush *flushFlag*,
void * *callbackTag*
)

Submit a request to compress a buffer of data.

This API consumes data from the input buffer and generates compressed data in the output buffer.

Context:
When called as an asynchronous function it cannot sleep. It can be executed in a context that does not permit sleeping. When called as a synchronous function it may sleep. It MUST NOT be executed in a context that DOES NOT permit sleeping.

Assumptions:
None

Side-Effects:
None

Blocking:
Yes when configured to operate in synchronous mode.

Reentrant:
No

Thread-safe:
Yes

Parameters:

`[in]`	*dcInstance*	Target service instance.
`[in,out]`	*pSessionHandle*	Session handle.
`[in]`	*pSrcBuff*	Pointer to data buffer for compression.
`[in]`	*pDestBuff*	Pointer to buffer space for data after compression.

[in,out]	*pResults*	Pointer to results structure
[in]	*flushFlag*	Indicates the type of flush to be performed.
[in]	*callbackTag*	User supplied value to help correlate the callback with its associated request.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_RETRY	Resubmit the request.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_RESOURCE	Error related to system resources.
CPA_DC_BAD_DATA	The input data was not properly formed.
CPA_STATUS_RESTARTING	API implementation is restarting. Resubmit the request.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:

pSessionHandle has been setup using **cpaDcInitSession()**

Postcondition:

pSessionHandle has session related state information

Note:

This function passes control to the compression service for processing

In synchronous mode the function returns the error status returned from the service. In asynchronous mode the status is returned by the callback function.

This function may be called repetitively with input until all of the input has been consumed by the compression service and all the output has been produced.

When this function returns, it may be that all of the available data in the input buffer has not been compressed. This situation will occur when there is insufficient space in the output buffer. The calling application should note the amount of data processed, and clear the output buffer and then submit the request again, with the input buffer pointer to the data that was not previously compressed.

Relationship between input buffers and results buffers.

1. Implementations of this API must not modify the individual flat buffers of the input buffer list.
2. The implementation communicates the amount of data consumed from the source buffer list via pResults->consumed arg.
3. The implementation communicates the amount of data in the destination buffer list via pResults->produced arg.

Source Buffer Setup Rules

1. The buffer list must have the correct number of flat buffers. This is specified by the numBuffers element of the CpaBufferList.
2. Each flat buffer must have a pointer to contiguous memory that has been allocated by the calling application. The number of octets to be compressed or decompressed must be stored in the dataLenInBytes element of the flat buffer.
3. It is permissible to have one or more flat buffers with a zero length data store. This function will process all flat buffers until the destination buffer is full or all source data has been processed. If a buffer has zero length, then no data will be processed from that buffer.

Source Buffer Processing Rules.

1. The buffer list is processed in index order - SrcBuff->pBuffers[0] will be completely processed before SrcBuff->pBuffers[1] begins to be processed.
2. The application must drain the destination buffers. If the source data was not completely consumed, the application must resubmit the request.
3. On return, the pResults->consumed will indicate the number of bytes consumed from the input buffers.

Destination Buffer Setup Rules

1. The destination buffer list must have storage for processed data. This implies at least one flat buffer must exist in the buffer list.
2. For each flat buffer in the buffer list, the dataLenInBytes element must be set to the size of the buffer space.
3. It is permissible to have one or more flat buffers with a zero length data store. If a buffer has zero length, then no data will be added to that buffer.

Destination Buffer Processing Rules.

1. The buffer list is processed in index order - DestBuff->pBuffers[0] will be completely processed before DestBuff->pBuffers[1] begins to be processed.
2. On return, the pResults->produced will indicate the number of bytes written to the output buffers.
3. If processing has not been completed, the application must drain the destination buffers and resubmit the request. The application must reset the dataLenInBytes for each flat buffer in the destination buffer list.

Checksum rules. If a checksum is specified in the session setup data, then:

1. For the first request for a particular data segment the checksum is initialised internally by the implementation.
2. The checksum is maintained by the implementation between calls until the flushFlag is set to CPA_DC_FLUSH_FINAL indicating the end of a particular data segment.
    a. Intermediate checksum values are returned to the application, via the CpaDcRqResults structure, in response to each request. However these checksum values are not guaranteed to the valid until the call with flushFlag set to CPA_DC_FLUSH_FINAL completes successfully.

The application should set flushFlag to CPA_DC_FLUSH_FINAL to indicate processing a particular data segment is complete. It should be noted that this function may have to be called more than once to process data after the flushFlag parameter has been set to CPA_DC_FLUSH_FINAL if the destination buffer fills. Refer to buffer processing rules.

For stateful operations, when the function is invoked with flushFlag set to CPA_DC_FLUSH_NONE or CPA_DC_FLUSH_SYNC, indicating more data is yet to come, the function may or may not retain data. When the function is invoked with flushFlag set to CPA_DC_FLUSH_FULL or CPA_DC_FLUSH_FINAL, the function will process all buffered data.

For stateless operations, CPA_DC_FLUSH_FINAL will cause the BFINAL bit to be set for deflate compression. The initial checksum for the stateless operation should be set to 0. CPA_DC_FLUSH_NONE and CPA_DC_FLUSH_SYNC should not be used for stateless operations.

It is possible to maintain checksum and length information across **cpaDcCompressData()** calls with a stateless session without maintaining the full history state that is maintained by a stateful session. In this mode of operation, an initial checksum value of 0 is passed into the first **cpaDcCompressData()** call with the flush flag set to CPA_DC_FLUSH_FULL. On subsequent calls to **cpaDcCompressData()** for this session, the checksum passed to cpaDcCompressData should be set to the checksum value produced by the previous call to **cpaDcCompressData()**. When the last block of input data is passed to

cpaDcCompressData(), the flush flag should be set to CP_DC_FLUSH_FINAL. This will cause the BFINAL bit to be set in a deflate stream. It is the responsibility of the calling application to maintain overall lengths across the stateless requests and to pass the checksum produced by one request into the next request.

When an instance supports compressAndVerifyAndRecover, it is enabled by default when using **cpaDcCompressData()**. If this feature needs to be disabled, **cpaDcCompressData2()** must be used.

Synchronous or Asynchronous operation of the API is determined by the value of the callbackFn parameter passed to **cpaDcInitSession()** when the sessionHandle was setup. If a non-NULL value was specified then the supplied callback function will be invoked asynchronously with the response of this request.

Response ordering: For each session, the implementation must maintain the order of responses. That is, if in asynchronous mode, the order of the callback functions must match the order of jobs submitted by this function. In a simple synchronous mode implementation, the practice of submitting a request and blocking on its completion ensure ordering is preserved.

This limitation does not apply if the application employs multiple threads to service a single session.

If this API is invoked asynchronous, the return code represents the success or not of asynchronously scheduling the request. The results of the operation, along with the amount of data consumed and produced become available when the callback function is invoked. As such, pResults->consumed and pResults->produced are available only when the operation is complete.

The application must not use either the source or destination buffers until the callback has completed.

See also:

None

CpaStatus cpaDcCompressData2 (**CpaInstanceHandle** *dcInstance*,
CpaDcSessionHandle *pSessionHandle*,
CpaBufferList * *pSrcBuff*,
CpaBufferList * *pDestBuff*,
CpaDcOpData * *pOpData*,
CpaDcRqResults * *pResults*,
void * *callbackTag*
)

Submit a request to compress a buffer of data.

This API consumes data from the input buffer and generates compressed data in the output buffer. This API is very similar to **cpaDcCompressData()** except it provides a CpaDcOpData structure for passing additional input parameters not covered in **cpaDcCompressData()**.

Context:

When called as an asynchronous function it cannot sleep. It can be executed in a context that does not permit sleeping. When called as a synchronous function it may sleep. It MUST NOT be executed in a context that DOES NOT permit sleeping.

Assumptions:

None

Side-Effects:

None

Blocking:

Yes when configured to operate in synchronous mode.

Reentrant:
No

Thread-safe:
Yes

Parameters:

[in]	*dcInstance*	Target service instance.
[in,out]	*pSessionHandle*	Session handle.
[in]	*pSrcBuff*	Pointer to data buffer for compression.
[in]	*pDestBuff*	Pointer to buffer space for data after compression.
[in,out]	*pOpData*	Additional parameters.
[in,out]	*pResults*	Pointer to results structure
[in]	*callbackTag*	User supplied value to help correlate the callback with its associated request.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_RETRY	Resubmit the request.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_RESOURCE	Error related to system resources.
CPA_DC_BAD_DATA	The input data was not properly formed.
CPA_STATUS_UNSUPPORTED	Function is not supported.
CPA_STATUS_RESTARTING	API implementation is restarting. Resubmit the request.

Precondition:
pSessionHandle has been setup using **cpaDcInitSession()**

Postcondition:
pSessionHandle has session related state information

Note:
This function passes control to the compression service for processing

See also:
cpaDcCompressData()

CpaStatus cpaDcDecompressData (**CpaInstanceHandle** *dcInstance*,
CpaDcSessionHandle *pSessionHandle*,
CpaBufferList * *pSrcBuff*,
CpaBufferList * *pDestBuff*,
CpaDcRqResults * *pResults*,
CpaDcFlush *flushFlag*,
void * *callbackTag*
)

Submit a request to decompress a buffer of data.

This API consumes compressed data from the input buffer and generates uncompressed data in the output buffer.

Context:
When called as an asynchronous function it cannot sleep. It can be executed in a context that does not permit sleeping. When called as a synchronous function it may sleep. It MUST NOT be

executed in a context that DOES NOT permit sleeping.

Assumptions:
None

Side-Effects:
None

Blocking:
Yes when configured to operate in synchronous mode.

Reentrant:
No

Thread-safe:
Yes

Parameters:

[in]	*dcInstance*	Target service instance.
[in,out]	*pSessionHandle*	Session handle.
[in]	*pSrcBuff*	Pointer to data buffer for compression.
[in]	*pDestBuff*	Pointer to buffer space for data after decompression.
[in,out]	*pResults*	Pointer to results structure
[in]	*flushFlag*	When set to CPA_DC_FLUSH_FINAL, indicates that the input buffer contains all of the data for the compression session, allowing the function to release history data.
[in]	*callbackTag*	User supplied value to help correlate the callback with its associated request.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_RETRY	Resubmit the request.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_RESOURCE	Error related to system resources.
CPA_DC_BAD_DATA	The input data was not properly formed.
CPA_STATUS_RESTARTING	API implementation is restarting. Resubmit the request.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:
pSessionHandle has been setup using **cpaDcInitSession()**

Postcondition:
pSessionHandle has session related state information

Note:
This function passes control to the compression service for decompression. The function returns the status from the service.

This function may be called repetitively with input until all of the input has been provided and all the output has been consumed.

This function has identical buffer processing rules as **cpaDcCompressData()**.

This function has identical checksum processing rules as **cpaDcCompressData()**.

The application should set flushFlag to CPA_DC_FLUSH_FINAL to indicate processing a particular compressed data segment is complete. It should be noted that this function may have to be called more than once to process data after flushFlag has been set if the destination buffer fills. Refer to buffer processing rules in **cpaDcCompressData()**.

Synchronous or Asynchronous operation of the API is determined by the value of the callbackFn parameter passed to **cpaDcInitSession()** when the sessionHandle was setup. If a non-NULL value was specified then the supplied callback function will be invoked asynchronously with the response of this request, along with the callbackTag specified in the function.

The same response ordering constraints identified in the cpaDcCompressData API apply to this function.

See also:
cpaDcCompressData()

CpaStatus cpaDcDecompressData2 (**CpaInstanceHandle** *dcInstance*,
CpaDcSessionHandle *pSessionHandle*,
CpaBufferList * *pSrcBuff*,
CpaBufferList * *pDestBuff*,
CpaDcOpData * *pOpData*,
CpaDcRqResults * *pResults*,
void * *callbackTag*
)

Submit a request to decompress a buffer of data.

This API consumes compressed data from the input buffer and generates uncompressed data in the output buffer. This API is very similar to **cpaDcDecompressData()** except it provides a CpaDcOpData structure for passing additional input parameters not covered in **cpaDcDecompressData()**.

Context:
When called as an asynchronous function it cannot sleep. It can be executed in a context that does not permit sleeping. When called as a synchronous function it may sleep. It MUST NOT be executed in a context that DOES NOT permit sleeping.

Assumptions:
None

Side-Effects:
None

Blocking:
Yes when configured to operate in synchronous mode.

Reentrant:
No

Thread-safe:
Yes

Parameters:

[in]	*dcInstance*	Target service instance.
[in,out]	*pSessionHandle*	Session handle.
[in]	*pSrcBuff*	Pointer to data buffer for compression.
[in]	*pDestBuff*	Pointer to buffer space for data after decompression.
[in]	*pOpData*	Additional input parameters.

[in,out]	*pResults*	Pointer to results structure
[in]	*callbackTag*	User supplied value to help correlate the callback with its associated request.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_RETRY	Resubmit the request.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_RESOURCE	Error related to system resources.
CPA_DC_BAD_DATA	The input data was not properly formed.
CPA_STATUS_UNSUPPORTED	Function is not supported.
CPA_STATUS_RESTARTING	API implementation is restarting. Resubmit the request.

Precondition:
pSessionHandle has been setup using **cpaDcInitSession()**

Postcondition:
pSessionHandle has session related state information

Note:
This function passes control to the compression service for decompression. The function returns the status from the service.

See also:
cpaDcDecompressData() cpaDcCompressData2() cpaDcCompressData()

CpaStatus cpaDcGenerateHeader (**CpaDcSessionHandle** *pSessionHandle*, **CpaFlatBuffer** * *pDestBuff*, **Cpa32U** * *count*)

Generate compression header.

This API generates the gzip or the zlib header and stores it in the output buffer.

Context:
This function may be call from any context.

Assumptions:
None

Side-Effects:
None

Blocking:
No

Reentrant:
No

Thread-safe:
Yes

Parameters:

[in,out]	*pSessionHandle*	Session handle.

`[in]`	*pDestBuff*	Pointer to data buffer where the compression header will go.
`[out]`	*count*	Pointer to counter filled in with header size.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_RESTARTING	API implementation is restarting. Resubmit the request.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:

pSessionHandle has been setup using **cpaDcInitSession()**

Note:

This function can output a 10 byte gzip header or 2 byte zlib header to the destination buffer. The session properties are used to determine the header type. To output a header the session must have been initialized with CpaDcCompType CPA_DC_DEFLATE for any other value no header is produced. To output a gzip header the session must have been initialized with CpaDcChecksum CPA_DC_CRC32. To output a zlib header the session must have been initialized with CpaDcChecksum CPA_DC_ADLER32. For CpaDcChecksum CPA_DC_NONE no header is output.

If the compression requires a gzip header, then this header requires at a minimum the following fields, defined in RFC1952: ID1: 0x1f ID2: 0x8b CM: Compression method = 8 for deflate

The zlib header is defined in RFC1950 and this function must implement as a minimum: CM: four bit compression method - 8 is deflate with window size to 32k CINFO: four bit window size (see RFC1950 for details), 7 is 32k window FLG: defined as:

- Bits 0 - 4: check bits for CM, CINFO and FLG (see RFC1950)
- Bit 5: FDICT 0 = default, 1 is preset dictionary
- Bits 6 - 7: FLEVEL, compression level (see RFC 1950)

The counter parameter will be set to the number of bytes added to the buffer. The pData will be not be changed.

See also:

None

CpaStatus cpaDcGenerateFooter (**CpaDcSessionHandle** *pSessionHandle*,
CpaFlatBuffer * *pDestBuff*,
CpaDcRqResults * *pResults*
)

Generate compression footer.

This API generates the footer for gzip or zlib and stores it in the output buffer.

Context:

This function may be call from any context.

Assumptions:

None

Side-Effects:

All session variables are reset

Blocking:
No

Reentrant:
No

Thread-safe:
Yes

Parameters:

[in,out]	*pSessionHandle*	Session handle.
[in]	*pDestBuff*	Pointer to data buffer where the compression footer will go.
[in,out]	*pResults*	Pointer to results structure filled by CpaDcCompressData. Updated with the results of this API call

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_UNSUPPORTED	Function is not supported.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_RESTARTING	API implementation is restarting. Resubmit the request.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:
pSessionHandle has been setup using **cpaDcInitSession()** pResults structure has been filled by CpaDcCompressData().

Note:
Depending on the session variables, this function can add the alder32 footer to the zlib compressed data as defined in RFC1950. If required, it can also add the gzip footer, which is the crc32 of the uncompressed data and the length of the uncompressed data. This section is defined in RFC1952. The session variables used to determine the header type are CpaDcCompType and CpaDcChecksum, see cpaDcGenerateHeader for more details.

An artifact of invoking this function for writing the footer data is that all opaque session specific data is re-initialized. If the compression level and file types are consistent, the upper level application can continue processing compression requests using the same session handle.

The produced element of the pResults structure will be incremented by the numbers bytes added to the buffer. The pointer to the buffer will not be modified.

This function is not supported for stateless sessions.

See also:
None

CpaStatus cpaDcGetStats (**CpaInstanceHandle** *dcInstance*,
CpaDcStats * *pStatistics*
)

Retrieve statistics

This API retrieves the current statistics for a compression instance.

Context:
This function may be call from any context.

Assumptions:
None

Side-Effects:
None

Blocking:
Yes

Reentrant:
No

Thread-safe:
Yes

Parameters:

[in]	*dcInstance*	Instance handle.
[out]	*pStatistics*	Pointer to statistics structure.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_RESTARTING	API implementation is restarting. Resubmit the request.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:
None

Postcondition:
None

See also:
None

CpaStatus cpaDcGetNumInstances (**Cpa16U** * *pNumInstances*)

Get the number of device instances that are supported by the API implementation.

This function will get the number of device instances that are supported by an implementation of the compression API. This number is then used to determine the size of the array that must be passed to **cpaDcGetInstances()**.

Context:
This function MUST NOT be called from an interrupt context as it MAY sleep.

Assumptions:
None

Side-Effects:
None

Blocking:
This function is synchronous and blocking.

Reentrant:
No

Thread-safe:
Yes

Parameters:
[out] *pNumInstances* Pointer to where the number of instances will be written.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:
None

Postcondition:
None

Note:
This function operates in a synchronous manner and no asynchronous callback will be generated

See also:
cpaDcGetInstances

CpaStatus cpaDcGetInstances (**Cpa16U** *numInstances*, **CpaInstanceHandle *** *dcInstances*)

Get the handles to the device instances that are supported by the API implementation.

This function will return handles to the device instances that are supported by an implementation of the compression API. These instance handles can then be used as input parameters with other compression API functions.

This function will populate an array that has been allocated by the caller. The size of this API is determined by the **cpaDcGetNumInstances()** function.

Context:
This function MUST NOT be called from an interrupt context as it MAY sleep.

Assumptions:
None

Side-Effects:
None

Blocking:
This function is synchronous and blocking.

Reentrant:
No

Thread-safe:
Yes

Parameters:

[in]	*numInstances*	Size of the array.
[out]	*dcInstances*	Pointer to where the instance handles will be written.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:
None

Postcondition:
None

Note:
This function operates in a synchronous manner and no asynchronous callback will be generated

See also:
cpaDcGetInstances

CpaStatus cpaDcGetNumIntermediateBuffers (**CpaInstanceHandle** *instanceHandle*, **Cpa16U** * *pNumBuffers*)

Compression Component utility function to determine the number of intermediate buffers required by an implementation.

This function will determine the number of intermediate buffer lists required by an implementation for a compression instance. These buffers should then be allocated and provided when calling **cpaDcStartInstance()** to start a compression instance that will use dynamic compression.

Context:
This function may sleep, and MUST NOT be called in interrupt context.

Assumptions:
None

Side-Effects:
None

Blocking:
This function is synchronous and blocking.

Reentrant:
No

Thread-safe:
Yes

Parameters:

[in,out]	*instanceHandle*	Handle to an instance of this API to be initialized.

[out]	*pNumBuffers*	When the function returns, this will specify the number of buffer lists that should be used as intermediate buffers when calling **cpaDcStartInstance()**.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed. Suggested course of action is to shutdown and restart.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:
None

Postcondition:
None

Note:
Note that this is a synchronous function and has no completion callback associated with it.

See also:
cpaDcStartInstance()

```
CpaStatus cpaDcStartInstance ( CpaInstanceHandle  instanceHandle,
                               Cpa16U             numBuffers,
                               CpaBufferList **   pIntermediateBuffers
                             )
```

Compression Component Initialization and Start function.

This function will initialize and start the compression component. It MUST be called before any other compress function is called. This function SHOULD be called only once (either for the very first time, or after an cpaDcStopInstance call which succeeded) per instance. Subsequent calls will have no effect.

If required by an implementation, this function can be provided with instance specific intermediate buffers. The intent is to provide an instance specific location to store intermediate results during dynamic instance Huffman tree compression requests. The memory should be accessible by the compression engine. The buffers are to support deflate compression with dynamic Huffman Trees. Each buffer list should be similar in size to twice the destination buffer size passed to the compress API. The number of intermediate buffer lists may vary between implementations and so **cpaDcGetNumIntermediateBuffers()** should be called first to determine the number of intermediate buffers required by the implementation.

If not required, this parameter can be passed in as NULL.

Context:
This function may sleep, and MUST NOT be called in interrupt context.

Assumptions:
None

Side-Effects:
None

Blocking:
This function is synchronous and blocking.

Reentrant:
No

Thread-safe:
Yes

Parameters:

`[in,out]`	*instanceHandle*	Handle to an instance of this API to be initialized.
`[in]`	*numBuffers*	Number of buffer lists represented by the pIntermediateBuffers parameter. Note: **cpaDcGetNumIntermediateBuffers()** can be used to determine the number of intermediate buffers that an implementation requires.
`[in]`	*pIntermediateBuffers*	Optional pointer to Instance specific DRAM buffer.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed. Suggested course of action is to shutdown and restart.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:
None

Postcondition:
None

Note:
Note that this is a synchronous function and has no completion callback associated with it.

See also:
cpaDcStopInstance() cpaDcGetNumIntermediateBuffers()

CpaStatus cpaDcStopInstance (**CpaInstanceHandle** *instanceHandle*)

Compress Component Stop function.

This function will stop the Compression component and free all system resources associated with it. The client MUST ensure that all outstanding operations have completed before calling this function. The recommended approach to ensure this is to deregister all session or callback handles before calling this function. If outstanding operations still exist when this function is invoked, the callback function for each of those operations will NOT be invoked and the shutdown will continue. If the component is to be restarted, then a call to cpaDcStartInstance is required.

Context:
This function may sleep, and so MUST NOT be called in interrupt context.

Assumptions:
None

Side-Effects:
None

Blocking:
This function is synchronous and blocking.

Reentrant:
No

Thread-safe:

Yes

Parameters:

`[in]`	*instanceHandle*	Handle to an instance of this API to be shutdown.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed. Suggested course of action is to ensure requests are not still being submitted and that all sessions are deregistered. If this does not help, then forcefully remove the component from the system.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:

The component has been initialized via cpaDcStartInstance

Postcondition:

None

Note:

Note that this is a synchronous function and has no completion callback associated with it.

See also:

cpaDcStartInstance()

CpaStatus cpaDcInstanceGetInfo2 (const **CpaInstanceHandle** *instanceHandle*, **CpaInstanceInfo2** * *pInstanceInfo2*)

Function to get information on a particular instance.

This function will provide instance specific information through a **CpaInstanceInfo2** structure.

Context:

This function will be executed in a context that requires that sleeping MUST NOT be permitted.

Assumptions:

None

Side-Effects:

None

Blocking:

Yes

Reentrant:

No

Thread-safe:

Yes

Parameters:

`[in]`	*instanceHandle*	Handle to an instance of this API to be initialized.
`[out]`	*pInstanceInfo2*	Pointer to the memory location allocated by the client into which the CpaInstanceInfo2 structure will be written.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:

The client has retrieved an instanceHandle from successive calls to **cpaDcGetNumInstances** and **cpaDcGetInstances**.

Postcondition:

None

Note:

None

See also:

cpaDcGetNumInstances, **cpaDcGetInstances**, **CpaInstanceInfo2**

CpaStatus cpaDcInstanceSetNotificationCb (const **CpaInstanceHandle** *instanceHandle*, const **CpaDcInstanceNotificationCbFunc** *pInstanceNotificationCb*, void * *pCallbackTag*)

Subscribe for instance notifications.

Clients of the CpaDc interface can subscribe for instance notifications by registering a **CpaDcInstanceNotificationCbFunc** function.

Context:

This function may be called from any context.

Assumptions:

None

Side-Effects:

None

Blocking:

No

Reentrant:

No

Thread-safe:

Yes

Parameters:

[in]	*instanceHandle*	Instance handle.
[in]	*pInstanceNotificationCb*	Instance notification callback function pointer.
[in]	*pCallbackTag*	Opaque value provided by user while making individual function calls.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:
Instance has been initialized.

Postcondition:
None

Note:
None

See also:
CpaDcInstanceNotificationCbFunc

CpaStatus cpaDcGetSessionSize (**CpaInstanceHandle** *dcInstance*,
CpaDcSessionSetupData * *pSessionData*,
Cpa32U * *pSessionSize*,
Cpa32U * *pContextSize*
)

Get the size of the memory required to hold the session information.

The client of the Data Compression API is responsible for allocating sufficient memory to hold session information and the context data. This function provides a means for determining the size of the session information and the size of the context data.

Context:
No restrictions

Assumptions:
None

Side-Effects:
None

Blocking:
No

Reentrant:
No

Thread-safe:
Yes

Parameters:

`[in]`	*dcInstance*	Instance handle.
`[in]`	*pSessionData*	Pointer to a user instantiated structure containing session data.
`[out]`	*pSessionSize*	On return, this parameter will be the size of the memory that will be required by **cpaDcInitSession()** for session data.
`[out]`	*pContextSize*	On return, this parameter will be the size of the memory that will be required for context data. Context data is save/restore data including history and any implementation specific data that is required for a save/restore operation.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:
None

Postcondition:
None

Note:
Only a synchronous version of this function is provided.

It is expected that context data is comprised of the history and any data stores that are specific to the history such as linked lists or hash tables. For stateless sessions the context size returned from this function will be zero. For stateful sessions the context size returned will depend on the session setup data and may be zero.

Session data is expected to include interim checksum values, various counters and other session related data that needs to persist between invocations. For a given implementation of this API, it is safe to assume that **cpaDcGetSessionSize()** will always return the same session size and that the size will not be different for different setup data parameters. However, it should be noted that the size may change: (1) between different implementations of the API (e.g. between software and hardware implementations or between different hardware implementations) (2) between different releases of the same API implementation.

See also:
cpaDcInitSession()

CpaStatus cpaDcBufferListGetMetaSize (const **CpaInstanceHandle** *instanceHandle*,
Cpa32U *numBuffers*,
Cpa32U * *pSizeInBytes*
)

Function to return the size of the memory which must be allocated for the pPrivateMetaData member of CpaBufferList.

This function is used to obtain the size (in bytes) required to allocate a buffer descriptor for the pPrivateMetaData member in the CpaBufferList structure. Should the function return zero then no meta data is required for the buffer list.

Context:
This function may be called from any context.

Assumptions:
None

Side-Effects:
None

Blocking:
No

Reentrant:
No

Thread-safe:
Yes

Parameters:

`[in]`	*instanceHandle*	Handle to an instance of this API.
`[in]`	*numBuffers*	The number of pointers in the CpaBufferList. This is the maximum number of CpaFlatBuffers which may be contained in this CpaBufferList.
`[out]`	*pSizeInBytes*	Pointer to the size in bytes of memory to be allocated when the client wishes to allocate a cpaFlatBuffer.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:
None

Postcondition:
None

Note:
None

See also:
cpaDcGetInstances()

CpaStatus cpaDcGetStatusText (const **CpaInstanceHandle** *dcInstance*,
const **CpaStatus** *errStatus*,
Cpa8S * *pStatusText*
)

Function to return a string indicating the specific error that occurred within the system.

When a function returns any error including CPA_STATUS_SUCCESS, the client can invoke this function to get a string which describes the general error condition, and if available additional information on the specific error. The Client MUST allocate CPA_STATUS_MAX_STR_LENGTH_IN_BYTES bytes for the buffer string.

Context:
This function may be called from any context.

Assumptions:
None

Side-Effects:
None

Blocking:
No

Reentrant:
No

Thread-safe:

Yes

Parameters:

[in]	*dcInstance*	Handle to an instance of this API.
[in]	*errStatus*	The error condition that occurred.
[in,out]	*pStatusText*	Pointer to the string buffer that will be updated with the status text. The invoking application MUST allocate this buffer to be exactly CPA_STATUS_MAX_STR_LENGTH_IN_BYTES.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed. Note, in this scenario it is INVALID to call this function a second time.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:
None

Postcondition:
None

Note:
None

See also:
CpaStatus

CpaStatus cpaDcSetAddressTranslation (const **CpaInstanceHandle** *instanceHandle*, **CpaVirtualToPhysical** *virtual2Physical*)

Set Address Translation function

This function is used to set the virtual to physical address translation routine for the instance. The specified routine is used by the instance to perform any required translation of a virtual address to a physical address. If the application does not invoke this function, then the instance will use its default method, such as virt2phys, for address translation.

Assumptions:
None

Side-Effects:
None

Blocking:
This function is synchronous and blocking.

Reentrant:
No

Thread-safe:
Yes

Parameters:

[in]	*instanceHandle*	Data Compression API instance handle.

[in]	*virtual2Physical*	Routine that performs virtual to physical address translation.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:
None

Postcondition:
None

See also:
None

CpaStatus cpaDcDpGetSessionSize (**CpaInstanceHandle** *dcInstance*, **CpaDcSessionSetupData** * *pSessionData*, **Cpa32U** * *pSessionSize*)

Get the size of the memory required to hold the data plane session information.

The client of the Data Compression API is responsible for allocating sufficient memory to hold session information. This function provides a means for determining the size of the session information and statistics information.

Context:
No restrictions

Assumptions:
None

Side-Effects:
None

Blocking:
Yes

Reentrant:
No

Thread-safe:
Yes

Parameters:

[in]	*dcInstance*	Instance handle.
[in]	*pSessionData*	Pointer to a user instantiated structure containing session data.
[out]	*pSessionSize*	On return, this parameter will be the size of the memory that will be required by **cpaDcInitSession()** for session data.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.

CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:
None

Postcondition:
None

Note:
Only a synchronous version of this function is provided.

Session data is expected to include interim checksum values, various counters and other other session related data that needs to persist between invocations. For a given implementation of this API, it is safe to assume that **cpaDcDpGetSessionSize()** will always return the same session size and that the size will not be different for different setup data parameters. However, it should be noted that the size may change: (1) between different implementations of the API (e.g. between software and hardware implementations or between different hardware implementations) (2) between different releases of the same API implementation

See also:
cpaDcDpInitSession()

CpaStatus cpaDcDpUpdateSession (const **CpaInstanceHandle** *dcInstance*,
CpaDcSessionHandle *pSessionHandle*,
CpaDcSessionUpdateData * *pSessionUpdateData*
)

Compression Session Update Function.

This function is used to modify some select compression parameters of a previously initialized session handlei for a data plane session. Th update will fail if resources required for the new session settings are not available. Specifically, this function may fail if no intermediate buffers are associated with the instance, and the intended change would require these buffers. This function can be called at any time after a successful call of **cpaDcDpInitSession()**. This function does not change the parameters to compression request already in flight.

Context:
This is a synchronous function that cannot sleep. It can be executed in a context that does not permit sleeping.

Assumptions:
None

Side-Effects:
None

Blocking:
No.

Reentrant:
No

Thread-safe:
No

Parameters:

[in]	*dcInstance*	Instance handle.
[in,out]	*pSessionHandle*	Session handle.
[in]	*pSessionUpdateData*	Session Data.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_RESOURCE	Error related to system resources.
CPA_STATUS_RESTARTING	API implementation is restarting. Resubmit the request

Precondition:
The component has been initialized via cpaDcStartInstance function. The session has been initialized via cpaDcDpInitSession function.

Postcondition:
None

Note:
This is a synchronous function and has no completion callback associated with it.

See also:
cpaDcDpInitSession()

CpaStatus cpaDcDpRemoveSession (const **CpaInstanceHandle** *dcInstance*, **CpaDcSessionHandle** *pSessionHandle*)

Compression Data Plane Session Remove Function.

This function will remove a previously initialized session handle and the installed callback handler function. Removal will fail if outstanding calls still exist for the initialized session handle. The client needs to retry the remove function at a later time. The memory for the session handle MUST not be freed until this call has completed successfully.

Context:
This is a synchronous function that cannot sleep. It can be executed in a context that does not permit sleeping.

Assumptions:
None

Side-Effects:
None

Blocking:
No.

Reentrant:
No

Thread-safe:
Yes

Parameters:

[in]	*dcInstance*	Instance handle.

`[in,out]` *pSessionHandle* Session handle.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_RETRY	Resubmit the request.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_RESOURCE	Error related to system resources.
CPA_STATUS_RESTARTING	API implementation is restarting. Resubmit the request.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:

The component has been initialized via **cpaDcStartInstance** function.

Postcondition:

None

Note:

This is a synchronous function and has no completion callback associated with it.

See also:

cpaDcDpInitSession

6 Data Compression Batch and Pack API

[Data Compression API]

Collaboration diagram for Data Compression Batch and Pack API:

6.1 Detailed Description

File: cpa_dc_bp.h

These functions specify the API for Data Compression operations related to the 'Batch and Pack' mode of operation.

Remarks:

6.2 Data Structures

- struct **_CpaDcBatchOpData**

6.3 Typedefs

- typedef **_CpaDcBatchOpData CpaDcBatchOpData**

6.4 Functions

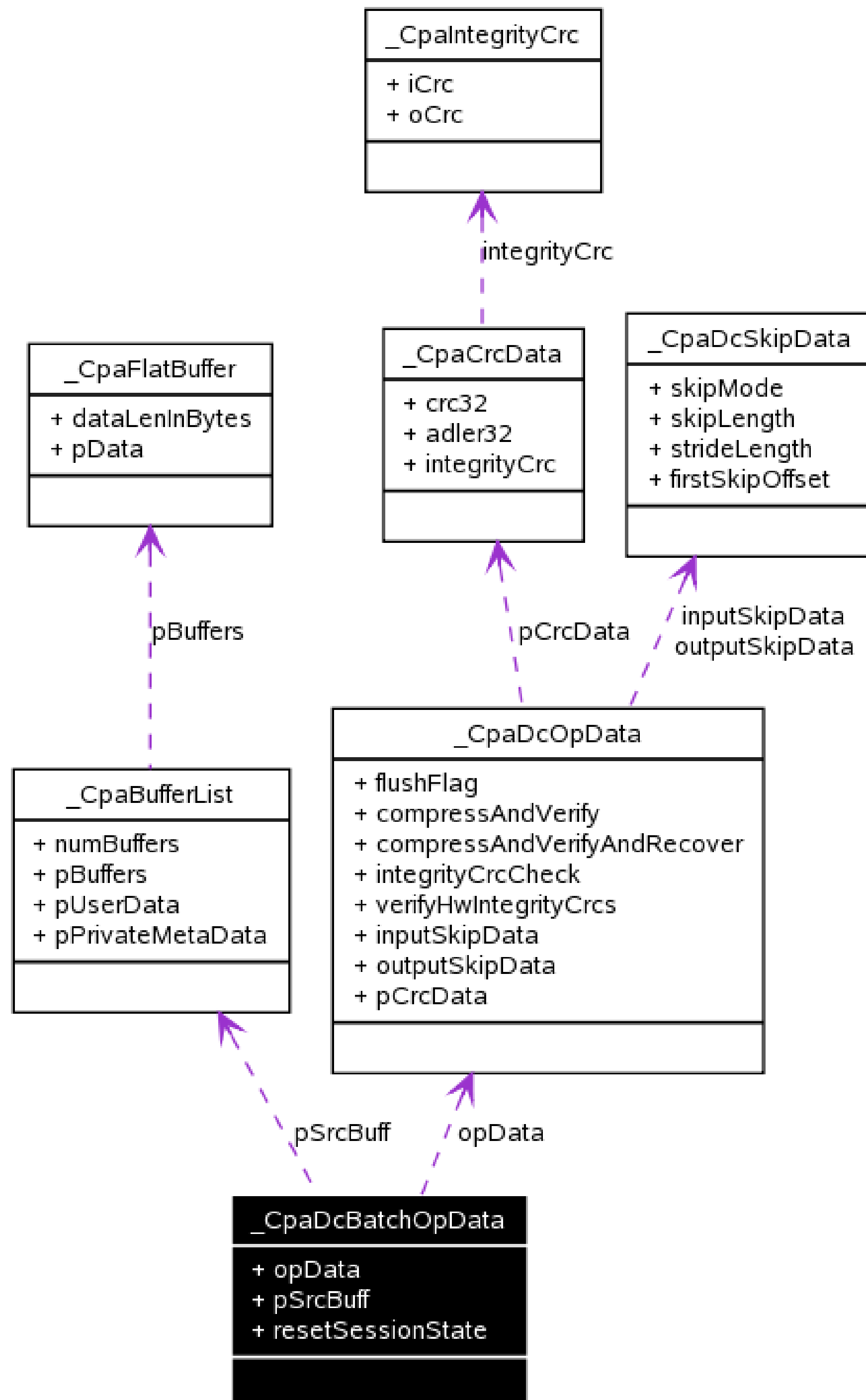
- **CpaStatus cpaDcBPCompressData** (**CpaInstanceHandle** dcInstance, **CpaDcSessionHandle** pSessionHandle, const **Cpa32U** numRequests, **CpaDcBatchOpData** *pBatchOpData, **CpaBufferList** *pDestBuff, **CpaDcRqResults** *pResults, void *callbackTag)
- **CpaStatus cpaDcBnpBufferListGetMetaSize** (const **CpaInstanceHandle** instanceHandle, **Cpa32U** numJobs, **Cpa32U** *pSizeInBytes)

6.5 Data Structure Documentation

6.5.1 _CpaDcBatchOpData Struct Reference

Collaboration diagram for _CpaDcBatchOpData:

6.5.1 _CpaDcBatchOpData Struct Reference



6.5.1.1 Detailed Description

Batch request input parameters.

This structure contains the request information for use with batched compression operations.

6.5.1.2 Data Fields

- **CpaDcOpData opData**
- **CpaBufferList * pSrcBuff**

• **CpaBoolean resetSessionState**

6.5.1.3 Field Documentation

CpaDcOpData _CpaDcBatchOpData::opData

Compression input parameters

CpaBufferList* _CpaDcBatchOpData::pSrcBuff

Input buffer list containing the data to be compressed.

CpaBoolean _CpaDcBatchOpData::resetSessionState

Reset the session state at the beginning of this request within the batch. Only applies to stateful sessions. When this flag is set, the history from previous requests in this session will not be used when compressing the input data for this request in the batch.

6.6 Typedef Documentation

typedef struct **_CpaDcBatchOpData CpaDcBatchOpData**

Batch request input parameters.

This structure contains the request information for use with batched compression operations.

6.7 Function Documentation

```
CpaStatus cpaDcBPCompressData ( CpaInstanceHandle    dcInstance,
                                CpaDcSessionHandle   pSessionHandle,
                                const Cpa32U         numRequests,
                                CpaDcBatchOpData *   pBatchOpData,
                                CpaBufferList *      pDestBuff,
                                CpaDcRqResults *     pResults,
                                void *               callbackTag
                              )
```

Submit a batch of requests to compress a batch of input buffers into a common output buffer. The same output buffer is used for each request in the batch. This is termed 'batch and pack'.

This API consumes data from the input buffer and generates compressed data in the output buffer. This API compresses a batch of input buffers and concatenates the compressed data into the output buffer. A results structure is also generated for each request in the batch.

Context:

When called as an asynchronous funnction it cannot sleep. It can be executed in a context that does not permit sleeping. When called as a synchronous function it may sleep. It MUST NOT be executed in a context that DOES NOT permit sleeping.

Assumptions:

None

Side-Effects:

None

Blocking:
Yes when configured to operate in synchronous mode.

Reentrant:
No

Thread-safe:
Yes

Parameters:

[in]	*dcInstance*	Target service instance.
[in,out]	*pSessionHandle*	Session handle.
[in]	*numRequests*	Number of requests in the batch.
[in]	*pBatchOpData*	Pointer to an array of CpaDcBatchOpData structures which contain the input buffers and parameters for each request in the batch. There should be numRequests entries in the array.
[in]	*pDestBuff*	Pointer to buffer space for data after compression.
[in,out]	*pResults*	Pointer to an array of results structures. There should be numRequests entries in the array.
[in]	*callbackTag*	User supplied value to help correlate the callback with its associated request.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_RETRY	Resubmit the request.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_RESOURCE	Error related to system resources.
CPA_DC_BAD_DATA	The input data was not properly formed.
CPA_STATUS_UNSUPPORTED	Function is not supported.
CPA_STATUS_RESTARTING	API implementation is restarting. Resubmit the request.

Precondition:
pSessionHandle has been setup using **cpaDcInitSession()** Session must be setup as a stateless sesssion.

Note:
This function passes control to the compression service for processing

In synchronous mode the function returns the error status returned from the service. In asynchronous mode the status is returned by the callback function.

This function may be called repetitively with input until all of the input has been consumed by the compression service and all the output has been produced.

When this function returns, it may be that all of the available buffers in the input list has not been compressed. This situation will occur when there is insufficient space in the output buffer. The calling application should note the amount of buffers processed, and then submit the request again, with a new output buffer and with the input buffer list containing the buffers that were not previously compressed.

Relationship between input buffers and results buffers.

1. Implementations of this API must not modify the individual flat buffers of the input buffer list.
2. The implementation communicates the number of buffers consumed from the source buffer list via pResults->consumed arg.

3. The implementation communicates the amount of data in the destination buffer list via pResults->produced arg.

Source Buffer Setup Rules

1. The buffer list must have the correct number of flat buffers. This is specified by the numBuffers element of the CpaBufferList.
2. Each flat buffer must have a pointer to contiguous memory that has been allocated by the calling application. The number of octets to be compressed or decompressed must be stored in the dataLenInBytes element of the flat buffer.
3. It is permissible to have one or more flat buffers with a zero length data store. This function will process all flat buffers until the destination buffer is full or all source data has been processed. If a buffer has zero length, then no data will be processed from that buffer.

Source Buffer Processing Rules.

1. The buffer list is processed in index order - SrcBuff->pBuffers[0] will be completely processed before SrcBuff->pBuffers[1] begins to be processed.
2. The application must drain the destination buffers. If the source data was not completely consumed, the application must resubmit the request.
3. On return, the pResults->consumed will indicate the number of buffers consumed from the input buffer list.

Destination Buffer Setup Rules

1. The destination buffer list must have storage for processed data and for the packed header information. This means that least two flat buffer must exist in the buffer list. The first buffer entry will be used for the header information. Subsequent entries will be used for the compressed data.
2. For each flat buffer in the buffer list, the dataLenInBytes element must be set to the size of the buffer space.
3. It is permissible to have one or more flat buffers with a zero length data store. If a buffer has zero length, then no data will be added to that buffer.

Destination Buffer Processing Rules.

1. The buffer list is processed in index order.
2. On return, the pResults->produced will indicate the number of bytes of compressed data written to the output buffers. Note that this will not include the header information buffer.
3. If processing has not been completed, the application must drain the destination buffers and resubmit the request. The application must reset the dataLenInBytes for each flat buffer in the destination buffer list.

Synchronous or Asynchronous operation of the API is determined by the value of the callbackFn parameter passed to **cpaDcInitSession()** when the sessionHandle was setup. If a non-NULL value was specified then the supplied callback function will be invoked asynchronously with the response of this request.

Response ordering: For each session, the implementation must maintain the order of responses. That is, if in asynchronous mode, the order of the callback functions must match the order of jobs submitted by this function. In a simple synchronous mode implementation, the practice of submitting a request and blocking on its completion ensure ordering is preserved.

This limitation does not apply if the application employs multiple threads to service a single session.

If this API is invoked asynchronous, the return code represents the success or not of asynchronously scheduling the request. The results of the operation, along with the amount of data consumed and produced become available when the callback function is invoked. As such, pResults->consumed and

pResults->produced are available only when the operation is complete.

The application must not use either the source or destination buffers until the callback has completed.

See also:
None

CpaStatus cpaDcBnpBufferListGetMetaSize (	const **CpaInstanceHandle**	*instanceHandle*,
	Cpa32U	*numJobs*,
	Cpa32U *	*pSizeInBytes*
)		

Function to return the size of the memory which must be allocated for the pPrivateMetaData member of CpaBufferList contained within CpaDcBatchOpData.

This function is used to obtain the size (in bytes) required to allocate a buffer descriptor for the pPrivateMetaData member in the CpaBufferList structure when Batch and Pack API are used. Should the function return zero then no meta data is required for the buffer list.

Context:
This function may be called from any context.

Assumptions:
None

Side-Effects:
None

Blocking:
No

Reentrant:
No

Thread-safe:
Yes

Parameters:

`[in]`	*instanceHandle*	Handle to an instance of this API.
`[in]`	*numJobs*	The number of jobs defined in the CpaDcBatchOpData table.
`[out]`	*pSizeInBytes*	Pointer to the size in bytes of memory to be allocated when the client wishes to allocate a cpaFlatBuffer and the Batch and Pack OP data.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.

Precondition:
None

Postcondition:
None

Note:
None

See also:
cpaDcBPCompressData()

7 Data Compression Chaining API

[Data Compression API]

Collaboration diagram for Data Compression Chaining API:

7.1 Detailed Description

File: cpa_dc_chain.h

These functions specify the API for Data Compression Chaining operations.

Remarks:

7.2 Data Structures

- struct **_CpaDcChainSessionSetupData**
- struct **_CpaDcChainOpData**
- struct **_CpaDcChainRqResults**

7.3 Typedefs

- typedef enum **_CpaDcChainOperations CpaDcChainOperations**
- typedef enum **_CpaDcChainSessionType CpaDcChainSessionType**
- typedef **_CpaDcChainSessionSetupData CpaDcChainSessionSetupData**
- typedef **_CpaDcChainOpData CpaDcChainOpData**
- typedef **_CpaDcChainRqResults CpaDcChainRqResults**

7.4 Enumerations

- enum **_CpaDcChainOperations** {
  CPA_DC_CHAIN_COMPRESS_THEN_HASH,
  CPA_DC_CHAIN_COMPRESS_THEN_ENCRYPT,
  CPA_DC_CHAIN_COMPRESS_THEN_HASH_ENCRYPT,
  CPA_DC_CHAIN_COMPRESS_THEN_ENCRYPT_HASH,
  CPA_DC_CHAIN_COMPRESS_THEN_AEAD,
  CPA_DC_CHAIN_HASH_THEN_COMPRESS,
  CPA_DC_CHAIN_HASH_VERIFY_THEN_DECOMPRESS,
  CPA_DC_CHAIN_DECRYPT_THEN_DECOMPRESS,
  CPA_DC_CHAIN_HASH_VERIFY_DECRYPT_THEN_DECOMPRESS,
  CPA_DC_CHAIN_DECRYPT_HASH_VERIFY_THEN_DECOMPRESS,
  CPA_DC_CHAIN_AEAD_THEN_DECOMPRESS,
  CPA_DC_CHAIN_DECOMPRESS_THEN_HASH_VERIFY,
  CPA_DC_CHAIN_COMPRESS_THEN_AEAD_THEN_HASH
  }
- enum **_CpaDcChainSessionType** {
  CPA_DC_CHAIN_COMPRESS_DECOMPRESS,
  CPA_DC_CHAIN_SYMMETRIC_CRYPTO

}

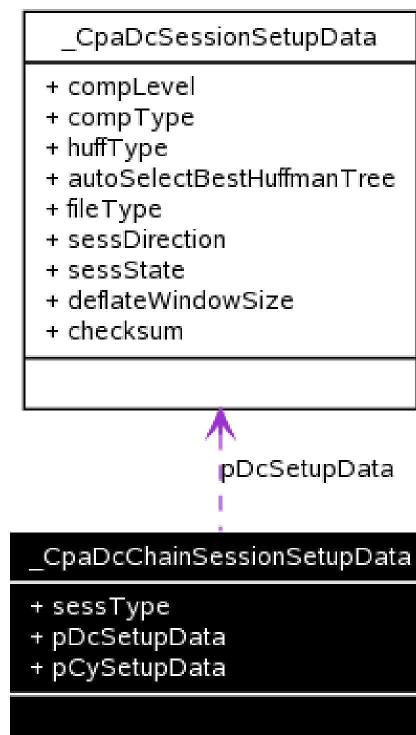
7.5 Functions

- **CpaStatus cpaDcChainGetSessionSize** (**CpaInstanceHandle** dcInstance, **CpaDcChainOperations** operation, **Cpa8U** numSessions, **CpaDcChainSessionSetupData** *pSessionData, **Cpa32U** *pSessionSize)
- **CpaStatus cpaDcChainInitSession** (**CpaInstanceHandle** dcInstance, **CpaDcSessionHandle** pSessionHandle, **CpaDcChainOperations** operation, **Cpa8U** numSessions, **CpaDcChainSessionSetupData** *pSessionData, **CpaDcCallbackFn** callbackFn)
- **CpaStatus cpaDcChainResetSession** (const **CpaInstanceHandle** dcInstance, **CpaDcSessionHandle** pSessionHandle)
- **CpaStatus cpaDcChainRemoveSession** (const **CpaInstanceHandle** dcInstance, **CpaDcSessionHandle** pSessionHandle)
- **CpaStatus cpaDcChainPerformOp** (**CpaInstanceHandle** dcInstance, **CpaDcSessionHandle** pSessionHandle, **CpaBufferList** *pSrcBuff, **CpaBufferList** *pDestBuff, **CpaDcChainOperations** operation, **Cpa8U** numOpDatas, **CpaDcChainOpData** *pChainOpData, **CpaDcChainRqResults** *pResults, void *callbackTag)

7.6 Data Structure Documentation

7.6.1 _CpaDcChainSessionSetupData Struct Reference

Collaboration diagram for _CpaDcChainSessionSetupData:



7.6.1.1 Detailed Description

Chaining Session Setup Data.

7.6.1 _CpaDcChainSessionSetupData Struct Reference

This structure contains data relating to set up chaining sessions. The client needs to complete the information in this structure in order to setup chaining sessions.

7.6.1.2 Data Fields

- **CpaDcChainSessionType sessType**
- **CpaDcSessionSetupData** * **pDcSetupData**
- CpaCySymSessionSetupData * **pCySetupData**

7.6.1.3 Field Documentation

CpaDcSessionSetupData* **_CpaDcChainSessionSetupData::pDcSetupData**

Pointer to compression session setup data

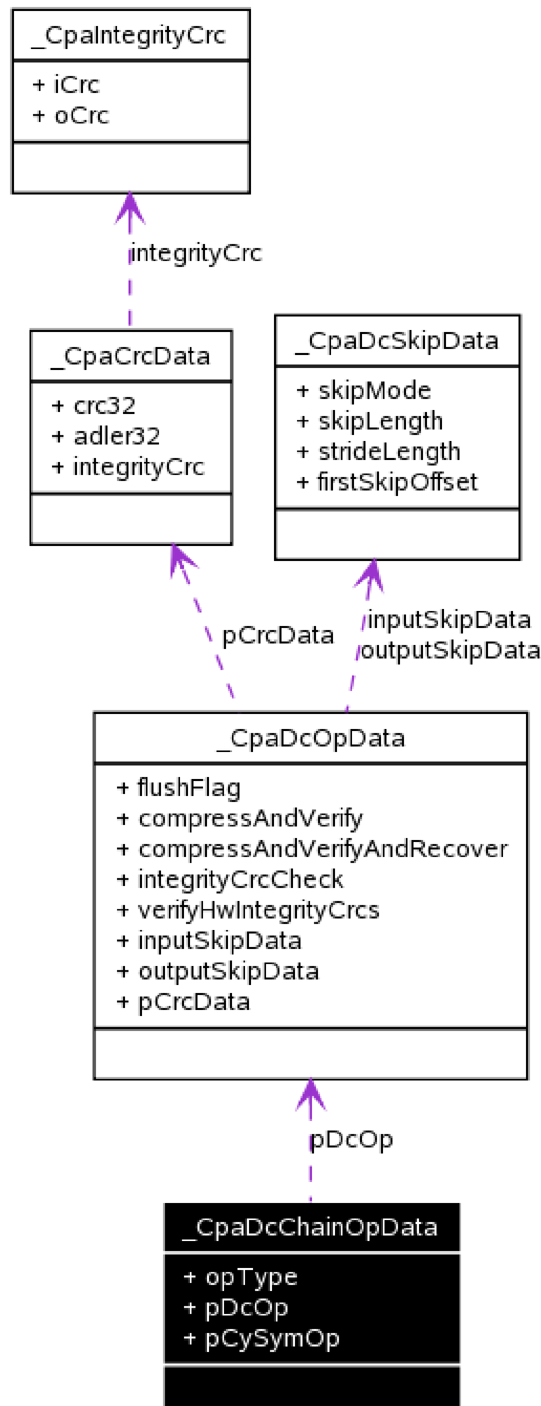
CpaCySymSessionSetupData* **_CpaDcChainSessionSetupData::pCySetupData**

Pointer to symmectric crypto session setup data

7.6.2 _CpaDcChainOpData Struct Reference

Collaboration diagram for _CpaDcChainOpData:

7.6.2 _CpaDcChainOpData Struct Reference



7.6.2.1 Detailed Description

Compression chaining request input parameters.

This structure contains the request information to use with compression chaining operations.

7.6.2.2 Data Fields

- **CpaDcChainSessionType opType**
- **CpaDcOpData * pDcOp**

- CpaCySymOpData * **pCySymOp**

7.6.2.3 Field Documentation

CpaDcChainSessionType _CpaDcChainOpData::opType

Indicate the type for this operation

CpaDcOpData* _CpaDcChainOpData::pDcOp

Pointer to compression operation data

CpaCySymOpData* **_CpaDcChainOpData::pCySymOp**

Pointer to symmectric crypto operation data

7.6.3 _CpaDcChainRqResults Struct Reference

7.6.3.1 Detailed Description

Chaining request results data

This structure contains the request results.

7.6.3.2 Data Fields

- **CpaDcReqStatus dcStatus**
- **CpaStatus cyStatus**
- **CpaBoolean verifyResult**
- **Cpa32U produced**
- **Cpa32U consumed**
- **Cpa32U crc32**
- **Cpa32U adler32**

7.6.3.3 Field Documentation

CpaDcReqStatus _CpaDcChainRqResults::dcStatus

Additional status details from compression accelerator

CpaStatus _CpaDcChainRqResults::cyStatus

Additional status details from symmetric crypto accelerator

CpaBoolean _CpaDcChainRqResults::verifyResult

This parameter is valid when the verifyDigest option is set in the CpaCySymSessionSetupData structure. A value of CPA_TRUE indicates that the compare succeeded. A value of CPA_FALSE indicates that the compare failed

Cpa32U _CpaDcChainRqResults::produced

Octets produced to the output buffer

Cpa32U _CpaDcChainRqResults::consumed

Octets consumed from the input buffer

Cpa32U _CpaDcChainRqResults::crc32

crc32 checksum produced by chaining operations

Cpa32U _CpaDcChainRqResults::adler32

adler32 checksum produced by chaining operations

7.7 Typedef Documentation

typedef enum **_CpaDcChainOperations CpaDcChainOperations**

Supported operations for compression chaining

This enumeration lists the supported operations for compression chaining

typedef enum **_CpaDcChainSessionType CpaDcChainSessionType**

Supported session types for data compression chaining.

This enumeration lists the supported session types for data compression chaining.

typedef struct **_CpaDcChainSessionSetupData CpaDcChainSessionSetupData**

Chaining Session Setup Data.

This structure contains data relating to set up chaining sessions. The client needs to complete the information in this structure in order to setup chaining sessions.

typedef struct **_CpaDcChainOpData CpaDcChainOpData**

Compression chaining request input parameters.

This structure contains the request information to use with compression chaining operations.

typedef struct **_CpaDcChainRqResults CpaDcChainRqResults**

Chaining request results data

This structure contains the request results.

7.8 Enumeration Type Documentation

enum **_CpaDcChainOperations**

Supported operations for compression chaining

This enumeration lists the supported operations for compression chaining

Enumerator:

CPA_DC_CHAIN_COMPRESS_THEN_HASH	2 operations for chaining: 1st operation is to perform compression on plain text 2nd operation is to perform hash on compressed text < 2 entries in CpaDcChainSessionSetupData array: 1st entry is for compression setup data 2nd

entry is for hash setup data

CPA_DC_CHAIN_COMPRESS_THEN_ENCRYPT
: 2 operations for chaining: 1st operation is to perform compression on plain text 2nd operation is to perform encryption on compressed text < 2 entries in CpaDcChainSessionSetupData array: 1st entry is for compression setup data 2nd entry is for encryption setup data

CPA_DC_CHAIN_COMPRESS_THEN_HASH_ENCRYPT
: 2 operations for chaining: 1st operation is to perform compression on plain text 2nd operation is to perform hash on compressed text and encryption on compressed text < 2 entries in CpaDcChainSessionSetupData array: 1st entry is for compression setup data 2nd entry is for hash and encryption setup data

CPA_DC_CHAIN_COMPRESS_THEN_ENCRYPT_HASH
: 2 operations for chaining: 1st operation is to perform compression on plain text 2nd operation is to perform encryption on compressed text and hash on compressed & encrypted text < 2 entries in CpaDcChainSessionSetupData array: 1st entry is for compression setup data 2nd entry is for encryption and hash setup data

CPA_DC_CHAIN_COMPRESS_THEN_AEAD
: 2 operations for chaining: 1st operation is to perform compression on plain text 2nd operation is to perform AEAD encryption on compressed text < 2 entries in CpaDcChainSessionSetupData array: 1st entry is for compression setup data 2nd entry is for AEAD encryption setup data

CPA_DC_CHAIN_HASH_THEN_COMPRESS
: 2 operations for chaining: 1st operation is to perform hash on plain text 2nd operation is to perform compression on plain text < 2 entries in CpaDcChainSessionSetupData array: 1st entry is for hash setup data 2nd entry is for compression setup data

CPA_DC_CHAIN_HASH_VERIFY_THEN_DECOMPRESS	2 operations for chaining: 1st operation is to perform hash verify on compressed text 2nd operation is to perform decompression on compressed text < 2 entries in CpaDcChainSessionSetupData array: 1st entry is for hash setup data 2nd entry is for decompression setup data
CPA_DC_CHAIN_DECRYPT_THEN_DECOMPRESS	2 operations for chaining: 1st operation is to perform decryption on compressed & encrypted text 2nd operation is to perform decompression on compressed text < 2 entries in CpaDcChainSessionSetupData array: 1st entry is for decryption setup data 2nd entry is for decompression setup data
CPA_DC_CHAIN_HASH_VERIFY_DECRYPT_THEN_DECOMPRESS	2 operations for chaining: 1st operation is to perform hash verify on compressed & encrypted text and decryption on compressed & encrypted text 2nd operation is to perform decompression on compressed text < 2 entries in CpaDcChainSessionSetupData array: 1st entry is for hash and decryption setup data 2nd entry is for decompression setup data
CPA_DC_CHAIN_DECRYPT_HASH_VERIFY_THEN_DECOMPRESS	2 operations for chaining: 1st operation is to perform decryption on compressed & encrypted text and hash verify on compressed text 2nd operation is to perform decompression on compressed text < 2 entries in CpaDcChainSessionSetupData array: 1st entry is for decryption and hash setup data 2nd entry is for decompression setup data
CPA_DC_CHAIN_AEAD_THEN_DECOMPRESS	2 operations for chaining: 1st operation is to perform AEAD decryption on compressed & encrypted text 2nd operation is to perform decompression on compressed text < 2 entries in CpaDcChainSessionSetupData array: 1st entry is for AEAD decryption setup data 2nd entry is for decompression setup data
CPA_DC_CHAIN_DECOMPRESS_THEN_HASH_VERIFY	2 operations for chaining: 1st operation is to perform

	decompression on compressed text 2nd operation is to perform hash verify on plain text < 2 entries in CpaDcChainSessionSetupData array: 1st entry is for decompression setup data 2nd entry is for hash setup data
CPA_DC_CHAIN_COMPRESS_THEN_AEAD_THEN_HASH	3 operations for chaining: 1st operation is to perform compression on plain text 2nd operation is to perform AEAD encryption compressed text 3rd operation is to perfom hash on compressed & encrypted text < 3 entries in CpaDcChainSessionSetupData array: 1st entry is for compression setup data 2nd entry is for AEAD encryption setup data 3rd entry is for hash setup data

enum **_CpaDcChainSessionType**

Supported session types for data compression chaining.

This enumeration lists the supported session types for data compression chaining.

Enumerator:

CPA_DC_CHAIN_COMPRESS_DECOMPRESS	Indicate the session is for compression or decompression
CPA_DC_CHAIN_SYMMETRIC_CRYPTO	Indicate the session is for symmetric crypto

7.9 Function Documentation

CpaStatus cpaDcChainGetSessionSize (**CpaInstanceHandle** *dcInstance*,
CpaDcChainOperations *operation*,
Cpa8U *numSessions*,
CpaDcChainSessionSetupData * *pSessionData*,
Cpa32U * *pSessionSize*
)

Get the size of the memory required to hold the chaining sessions information.

The client of the Data Compression API is responsible for allocating sufficient memory to hold chaining sessions information. This function provides a way for determining the size of chaining sessions.

Context:

No restrictions

Assumptions:

None

Side-Effects:

None

Blocking:
No

Reentrant:
No

Thread-safe:
Yes

Parameters:

[in]	*dcInstance*	Instance handle.
[in]	*operation*	The operation for chaining
[in]	*numSessions*	Number of sessions for the chaining
[in]	*pSessionData*	Pointer to an array of CpaDcChainSessionSetupData structures. There should be numSessions entries in the array.
[out]	*pSessionSize*	On return, this parameter will be the size of the memory that will be required by **cpaDcChainInitSession()** for session data.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:
None

Postcondition:
None

Note:
Only a synchronous version of this function is provided.

See also:
cpaDcChainInitSession()

CpaStatus cpaDcChainInitSession (**CpaInstanceHandle** *dcInstance*,
CpaDcSessionHandle *pSessionHandle*,
CpaDcChainOperations *operation*,
Cpa8U *numSessions*,
CpaDcChainSessionSetupData * *pSessionData*,
CpaDcCallbackFn *callbackFn*
)

Initialize data compression chaining session

This function is used to initialize compression/decompression chaining sessions. This function returns a unique session handle each time this function is invoked. If the session has been configured with a callback function, then the order of the callbacks are guaranteed to be in the same order the compression or decompression requests were submitted for each session, so long as a single thread of execution is used for job submission.

Context:
This is a synchronous function and it cannot sleep. It can be executed in a context that does not permit sleeping.

Assumptions:
None

Side-Effects:
None

Blocking:
No

Reentrant:
No

Thread-safe:
Yes

Parameters:

[in]	*dcInstance*	Instance handle derived from discovery functions.
[in,out]	*pSessionHandle*	Pointer to a session handle.
[in]	*operation*	The operations for chaining
[in]	*numSessions*	Number of sessions for chaining
[in,out]	*pSessionData*	Pointer to an array of CpaDcChainSessionSetupData structures. There should be numSessions entries in the array.
[in]	*callbackFn*	For synchronous operation this callback shall be a null pointer.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_RESOURCE	Error related to system resources.
CPA_STATUS_RESTARTING	API implementation is restarting. Resubmit the request.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:
dcInstance has been started using cpaDcStartInstance.

Postcondition:
None

Note:
Only a synchronous version of this function is provided.

pSessionData Setup Rules

1. Each element in CpaDcChainSessionSetupData structure array provides (de)compression or a symmetric crypto session setup data.

1. The supported chaining operations are listed in CpaDcChainOperations. This enum indicates the number of operations in a chain and the order in which they are performed.

1. The order of entries in pSessionData[] should be consistent with the CpaDcChainOperations perform order. As an example, for CPA_DC_CHAIN_COMPRESS_THEN_ENCRYPT, pSessionData[0] holds the compression setup data and pSessionData[1] holds the encryption setup data..

1. The numSessions for each chaining operation are provided in the comments of enum CpaDcChainOperations.

1. For a (de)compression session, the corresponding pSessionData[]->sessType should be set to CPA_DC_CHAIN_COMPRESS_DECOMPRESS and pSessionData[]->pDcSetupData should point to a CpaDcSessionSetupData structure.

1. For a symmetric crypto session, the corresponding pSessionData[]->sessType should be set to CPA_DC_CHAIN_SYMMETRIC_CRYPTO and pSessionData[]->pCySetupData should point to a CpaCySymSessionSetupData structure.

1. Combined compression sessions are not supported for chaining.

1. Stateful compression is not supported for chaining.

1. Both CRC32 and Adler32 over the input data are supported for chaining.

See also:
None

CpaStatus cpaDcChainResetSession (const **CpaInstanceHandle** *dcInstance*,
CpaDcSessionHandle *pSessionHandle*
)

Reset a compression chaining session.

This function will reset a previously initialized session handle. Reset will fail if outstanding calls still exist for the initialized session handle. The client needs to retry the reset function at a later time.

Context:
This is a synchronous function that cannot sleep. It can be executed in a context that does not permit sleeping.

Assumptions:
None

Side-Effects:
None

Blocking:
No.

Reentrant:
No

Thread-safe:
Yes

Parameters:

`[in]`	*dcInstance*	Instance handle.
`[in,out]`	*pSessionHandle*	Session handle.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_RETRY	Resubmit the request.

CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:
The component has been initialized via cpaDcStartInstance function. The session has been initialized via cpaDcChainInitSession function.

Postcondition:
None

Note:
This is a synchronous function and has no completion callback associated with it.

See also:
cpaDcChainInitSession()

CpaStatus cpaDcChainRemoveSession (const **CpaInstanceHandle** *dcInstance*, **CpaDcSessionHandle** *pSessionHandle*)

Remove a compression chaining session.

This function will remove a previously initialized session handle and the installed callback handler function. Removal will fail if outstanding calls still exist for the initialized session handle. The client needs to retry the remove function at a later time. The memory for the session handle MUST not be freed until this call has completed successfully.

Context:
This is a synchronous function that cannot sleep. It can be executed in a context that does not permit sleeping.

Assumptions:
None

Side-Effects:
None

Blocking:
No.

Reentrant:
No

Thread-safe:
Yes

Parameters:

`[in]`	*dcInstance*	Instance handle.
`[in,out]`	*pSessionHandle*	Session handle.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_RETRY	Resubmit the request.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_RESOURCE	Error related to system resources.

CPA_STATUS_RESTARTING	API implementation is restarting. Resubmit the request.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:
The component has been initialized via cpaDcStartInstance function.

Postcondition:
None

Note:
This is a synchronous function and has no completion callback associated with it.

See also:
cpaDcChainInitSession()

```
CpaStatus cpaDcChainPerformOp ( CpaInstanceHandle       dcInstance,
                                CpaDcSessionHandle      pSessionHandle,
                                CpaBufferList *         pSrcBuff,
                                CpaBufferList *         pDestBuff,
                                CpaDcChainOperations    operation,
                                Cpa8U                   numOpDatas,
                                CpaDcChainOpData *      pChainOpData,
                                CpaDcChainRqResults *   pResults,
                                void *                  callbackTag
                              )
```

Submit a request to perform chaining operations.

This function is used to perform chaining operations over data from the source buffer.

Context:
When called as an asynchronous function it cannot sleep. It can be executed in a context that does not permit sleeping. When called as a synchronous function it may sleep. It MUST NOT be executed in a context that DOES NOT permit sleeping.

Assumptions:
None

Side-Effects:
None

Blocking:
Yes when configured to operate in synchronous mode.

Reentrant:
No

Thread-safe:
Yes

Parameters:

`[in]`	*dcInstance*	Target service instance.
`[in,out]`	*pSessionHandle*	Session handle.
`[in]`	*pSrcBuff*	Pointer to input data buffer.
`[out]`	*pDestBuff*	Pointer to output data buffer.
`[in]`	*operation*	Operation for the chaining request

[in]	*numOpDatas*	The entries size CpaDcChainOpData array
[in]	*pChainOpData*	Pointer to an array of CpaDcChainOpData structures. There should be numOpDatas entries in the array.
[in,out]	*pResults*	Pointer to CpaDcChainRqResults structure.
[in]	*callbackTag*	User supplied value to help correlate the callback with its associated request.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_RETRY	Resubmit the request.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_RESOURCE	Error related to system resources.
CPA_DC_BAD_DATA	The input data was not properly formed.
CPA_STATUS_RESTARTING	API implementation is restarting. Resubmit the request.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:

pSessionHandle has been setup using **cpaDcChainInitSession()**

Postcondition:

pSessionHandle has session related state information

Note:

This function passes control to the compression service for chaining processing, the supported chaining operations are described in CpaDcChainOperations.

pChainOpData Setup Rules

1. Each element in CpaDcChainOpData structure array holds either a (de)compression or a symmetric crypto operation data.

1. The order of entries in pChainOpData[] must be consistent with the order of operations described for the chaining operation in CpaDcChainOperations. As an example, for CPA_DC_CHAIN_COMPRESS_THEN_ENCRYPT, pChainOpData[0] must contain the compression operation data and pChainOpData[1] must contain the encryption operation data.

1. The numOpDatas for each chaining operation are specified in the comments for the operation in CpaDcChainOperations.

1. For a (de)compression operation, the corresponding pChainOpData[]->opType should be set to CPA_DC_CHAIN_COMPRESS_DECOMPRESS and pChainOpData[]->pDcOp should point to a CpaDcOpData structure.

1. For a symmetric crypto operation, the corresponding pChainOpData[]->opType should be set to CPA_DC_CHAIN_SYMMETRIC_CRYPTO and pChainOpData[]->pCySymOp should point to a CpaCySymOpData structure.

1. Stateful compression is not supported for chaining.

1. Partial packet processing is not supported.

This function has identical buffer processing rules as **cpaDcCompressData()**.

This function has identical checksum processing rules as **cpaDcCompressData()**, except:

1. pResults->crc32 is available to application if CpaDcSessionSetupData->checksum is set to CPA_DC_CRC32

1. pResults->adler32 is available to application if CpaDcSessionSetupData->checksum is set to CPA_DC_ADLER32

1. Both pResults->crc32 and pResults->adler32 are available if CpaDcSessionSetupData->checksum is set to CPA_DC_CRC32_ADLER32

Synchronous or asynchronous operation of the API is determined by the value of the callbackFn parameter passed to **cpaDcChainInitSession()** when the sessionHandle was setup. If a non-NULL value was specified then the supplied callback function will be invoked asynchronously with the response of this request.

This function has identical response ordering rules as **cpaDcCompressData()**.

See also:

cpaDcCompressData

8 Data Compression Data Plane API

[Data Compression API]

Collaboration diagram for Data Compression Data Plane API:

8.1 Detailed Description

File: cpa_dc_dp.h

These data structures and functions specify the Data Plane API for compression and decompression operations.

This API is recommended for data plane applications, in which the cost of offload - that is, the cycles consumed by the driver in sending requests to the hardware, and processing responses - needs to be minimized. In particular, use of this API is recommended if the following constraints are acceptable to your application:

- Thread safety is not guaranteed. Each software thread should have access to its own unique instance (CpaInstanceHandle) to avoid contention.
- Polling is used, rather than interrupts (which are expensive). Implementations of this API will provide a function (not defined as part of this API) to read responses from the hardware response queue and dispatch callback functions, as specified on this API.
- Buffers and buffer lists are passed using physical addresses, to avoid virtual to physical address translation costs.
- The ability to enqueue one or more requests without submitting them to the hardware allows for certain costs to be amortized across multiple requests.
- Only asynchronous invocation is supported.
- There is no support for partial packets.
- Implementations may provide certain features as optional at build time, such as atomic counters.
- There is no support for stateful operations.
    - The "default" instance (CPA_INSTANCE_HANDLE_SINGLE) is not supported on this API. The specific handle should be obtained using the instance discovery functions (**cpaDcGetNumInstances**, **cpaDcGetInstances**).

8.2 Data Structures

- struct **_CpaDcDpOpData**

8.3 Typedefs

- typedef **_CpaDcDpOpData CpaDcDpOpData**
- typedef void(* **CpaDcDpCallbackFn**)(**CpaDcDpOpData** *pOpData)

8.4 Functions

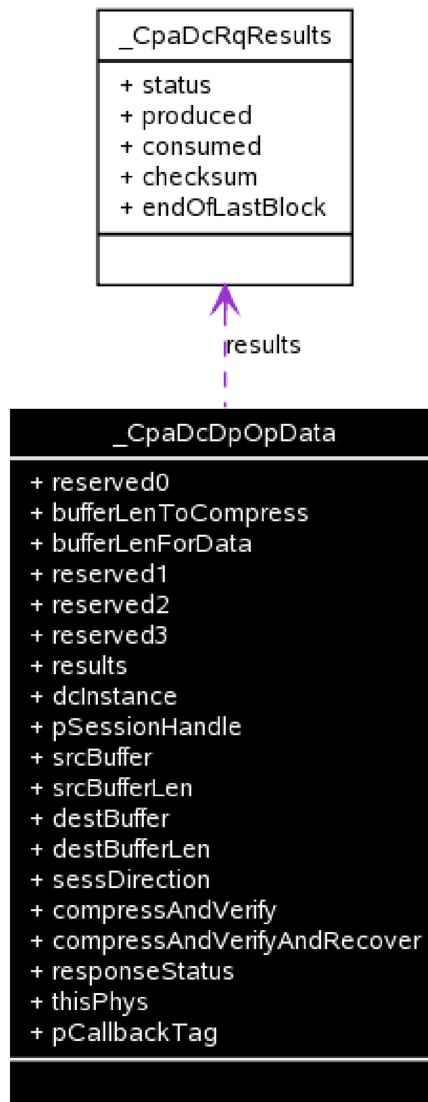
- **CpaStatus cpaDcDpInitSession** (**CpaInstanceHandle** dcInstance, **CpaDcSessionHandle** pSessionHandle, **CpaDcSessionSetupData** *pSessionData)

- **CpaStatus cpaDcDpRegCbFunc** (const **CpaInstanceHandle** dcInstance, const **CpaDcDpCallbackFn** pNewCb)
- **CpaStatus cpaDcDpEnqueueOp** (**CpaDcDpOpData** *pOpData, const **CpaBoolean** performOpNow)
- **CpaStatus cpaDcDpEnqueueOpBatch** (const **Cpa32U** numberRequests, **CpaDcDpOpData** *pOpData[], const **CpaBoolean** performOpNow)
- **CpaStatus cpaDcDpPerformOpNow** (**CpaInstanceHandle** dcInstance)

8.5 Data Structure Documentation

8.5.1 _CpaDcDpOpData Struct Reference

Collaboration diagram for _CpaDcDpOpData:



8.5.1.1 Detailed Description

Operation Data for compression data plane API.

8.5.1 _CpaDcDpOpData Struct Reference

This structure contains data relating to a request to perform compression processing on one or more data buffers.

The physical memory to which this structure points should be at least 8-byte aligned.

All reserved fields SHOULD NOT be written or read by the calling code.

See also:
cpaDcDpEnqueueOp, **cpaDcDpEnqueueOpBatch**

8.5.1.2 Data Fields

- **Cpa64U reserved0**
- **Cpa32U bufferLenToCompress**
- **Cpa32U bufferLenForData**
- **Cpa64U reserved1**
- **Cpa64U reserved2**
- **Cpa64U reserved3**
- **CpaDcRqResults results**
- **CpaInstanceHandle dcInstance**
- **CpaDcSessionHandle pSessionHandle**
- **CpaPhysicalAddr srcBuffer**
- **Cpa32U srcBufferLen**
- **CpaPhysicalAddr destBuffer**
- **Cpa32U destBufferLen**
- **CpaDcSessionDir sessDirection**
- **CpaBoolean compressAndVerify**
- **CpaBoolean compressAndVerifyAndRecover**
- **CpaStatus responseStatus**
- **CpaPhysicalAddr thisPhys**
- void * **pCallbackTag**

8.5.1.3 Field Documentation

Cpa64U _CpaDcDpOpData::reserved0

Reserved for internal use. Source code should not read or write this field.

Cpa32U _CpaDcDpOpData::bufferLenToCompress

The number of bytes from the source buffer to compress. This must be less than, or more typically equal to, the total size of the source buffer (or buffer list).

Cpa32U _CpaDcDpOpData::bufferLenForData

The maximum number of bytes that should be written to the destination buffer. This must be less than, or more typically equal to, the total size of the destination buffer (or buffer list).

Cpa64U _CpaDcDpOpData::reserved1

Reserved for internal use. Source code should not read or write

Cpa64U _CpaDcDpOpData::reserved2

Reserved for internal use. Source code should not read or write

Cpa64U _CpaDcDpOpData::reserved3

Reserved for internal use. Source code should not read or write

CpaDcRqResults _CpaDcDpOpData::results

Results of the operation. Contents are valid upon completion.

CpaInstanceHandle _CpaDcDpOpData::dcInstance

Instance to which the request is to be enqueued

CpaDcSessionHandle _CpaDcDpOpData::pSessionHandle

DC Session associated with the stream of requests

CpaPhysicalAddr _CpaDcDpOpData::srcBuffer

Physical address of the source buffer on which to operate. This is either the location of the data, of length srcBufferLen; or, if srcBufferLen has the special value **CPA_DP_BUFLIST**, then srcBuffer contains the location where a **CpaPhysBufferList** is stored.

Cpa32U _CpaDcDpOpData::srcBufferLen

If the source buffer is a "flat buffer", then this field specifies the size of the buffer, in bytes. If the source buffer is a "buffer list" (of type **CpaPhysBufferList**), then this field should be set to the value **CPA_DP_BUFLIST**.

CpaPhysicalAddr _CpaDcDpOpData::destBuffer

Physical address of the destination buffer on which to operate. This is either the location of the data, of length destBufferLen; or, if destBufferLen has the special value **CPA_DP_BUFLIST**, then destBuffer contains the location where a **CpaPhysBufferList** is stored.

Cpa32U _CpaDcDpOpData::destBufferLen

If the destination buffer is a "flat buffer", then this field specifies the size of the buffer, in bytes. If the destination buffer is a "buffer list" (of type **CpaPhysBufferList**), then this field should be set to the value **CPA_DP_BUFLIST**.

CpaDcSessionDir _CpaDcDpOpData::sessDirection

Session direction indicating whether session is used for compression, decompression. For the DP implementation, CPA_DC_DIR_COMBINED is not a valid selection.

CpaBoolean _CpaDcDpOpData::compressAndVerify

If set to true, for compression operations, the implementation will verify that compressed data, generated by the compression operation, can be successfully decompressed. This behavior is only supported for stateless compression. This behavior is only supported on instances that support the compressAndVerify capability.

CpaBoolean _CpaDcDpOpData::compressAndVerifyAndRecover

If set to true, for compression operations, the implementation will automatically recover from a compressAndVerify error. This behavior is only supported for stateless compression. This behavior is only supported on instances that support the compressAndVerifyAndRecover capability. The compressAndVerify field in CpaDcOpData MUST be set to CPA_TRUE if compressAndVerifyAndRecover is set to CPA_TRUE.

CpaStatus _CpaDcDpOpData::responseStatus

Status of the operation. Valid values are CPA_STATUS_SUCCESS, CPA_STATUS_FAIL and CPA_STATUS_UNSUPPORTED.

CpaPhysicalAddr _CpaDcDpOpData::thisPhys

Physical address of this data
structure

void* **_CpaDcDpOpData::pCallbackTag**

Opaque data that will be returned to the client in the function completion callback.

This opaque data is not used by the implementation of the API, but is simply returned as part of the asynchronous response. It may be used to store information that might be useful when processing the response later.

8.6 Typedef Documentation

typedef struct **_CpaDcDpOpData CpaDcDpOpData**

Operation Data for compression data plane API.

This structure contains data relating to a request to perform compression processing on one or more data buffers.

The physical memory to which this structure points should be at least 8-byte aligned.

All reserved fields SHOULD NOT be written or read by the calling code.

See also:
cpaDcDpEnqueueOp, **cpaDcDpEnqueueOpBatch**

typedef void(* **CpaDcDpCallbackFn**)(**CpaDcDpOpData** *pOpData)

Definition of callback function for compression data plane API.

This is the callback function prototype. The callback function is registered by the application using the **cpaDcDpRegCbFunc** function call, and called back on completion of asychronous requests made via calls to **cpaDcDpEnqueueOp** or **cpaDcDpEnqueueOpBatch**.

Context:
This callback function can be executed in a context that DOES NOT permit sleeping to occur.

Assumptions:
None

Side-Effects:
None

Reentrant:
No

Thread-safe:
No

Parameters:

`[in]`	*pOpData*	Pointer to the **CpaDcDpOpData** object which was supplied as part of the original request.

Returns:
None

Precondition:
Instance has been initialized. Callback has been registered with **cpaDcDpRegCbFunc**.

Postcondition:
None

Note:
None

See also:
cpaDcDpRegCbFunc

8.7 Function Documentation

CpaStatus cpaDcDpInitSession (**CpaInstanceHandle** *dcInstance*, **CpaDcSessionHandle** *pSessionHandle*, **CpaDcSessionSetupData** * *pSessionData*)

Initialize compression or decompression data plane session.

This function is used to initialize a compression/decompression session. A single session can be used for both compression and decompression requests. Clients MUST register a callback function for the compression service using this function. This function returns a unique session handle each time this function is invoked. The order of the callbacks are guaranteed to be in the same order the compression or decompression requests were submitted for each session, so long as a single thread of execution is used for job submission.

Context:
This function may be called from any context.

Assumptions:
None

Side-Effects:
None

Blocking:
Yes

Reentrant:
No

Thread-safe:
Yes

Parameters:

`[in]`	*dcInstance*	Instance handle derived from discovery functions.
`[in,out]`	*pSessionHandle*	Pointer to a session handle.
`[in,out]`	*pSessionData*	Pointer to a user instantiated structure containing session data.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.

CPA_STATUS_RESOURCE	Error related to system resources.
CPA_STATUS_RESTARTING	API implementation is restarting. Resubmit the request.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:
dcInstance has been started using **cpaDcStartInstance**.

Postcondition:
None

Note:
Only a synchronous version of this function is provided.

This initializes opaque data structures in the session handle. Data compressed under this session will be compressed to the level specified in the pSessionData structure. Lower compression level numbers indicate a request for faster compression at the expense of compression ratio. Higher compression level numbers indicate a request for higher compression ratios at the expense of execution time.

The session is opaque to the user application and the session handle contains job specific data.

The window size specified in the pSessionData must match exactly one of the supported window sizes specified in the capability structure. If a bi-directional session is being initialized, then the window size must be valid for both compress and decompress.

Note stateful sessions are not supported by this API.

See also:
None

CpaStatus cpaDcDpRegCbFunc (const **CpaInstanceHandle** *dcInstance*, const **CpaDcDpCallbackFn** *pNewCb*)

Registration of the operation completion callback function.

This function allows a completion callback function to be registered. The registered callback function is invoked on completion of asychronous requests made via calls to **cpaDcDpEnqueueOp** or **cpaDcDpEnqueueOpBatch**.

Context:
This is a synchronous function and it cannot sleep. It can be executed in a context that DOES NOT permit sleeping.

Assumptions:
None

Side-Effects:
None

Reentrant:
No

Thread-safe:
No

Parameters:

[in]	*dcInstance*	Instance on which the callback function is to be registered.
[in]	*pNewCb*	Callback function for this instance.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_RESOURCE	Error related to system resources.
CPA_STATUS_RESTARTING	API implementation is restarting. Resubmit the request.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:

Instance has been initialized.

Postcondition:

None

Note:

None

See also:

cpaDcDpCbFunc

CpaStatus cpaDcDpEnqueueOp (**CpaDcDpOpData** * *pOpData*,
const **CpaBoolean** *performOpNow*
)

Enqueue a single compression or decompression request.

This function enqueues a single request to perform a compression, decompression operation.

The function is asynchronous; control is returned to the user once the request has been submitted. On completion of the request, the application may poll for responses, which will cause a callback function (registered via **cpaDcDpRegCbFunc**) to be invoked. Callbacks within a session are guaranteed to be in the same order in which they were submitted.

The following restrictions apply to the pOpData parameter:

- The memory MUST be aligned on an 8-byte boundary.
- The reserved fields of the structure MUST NOT be written to or read from.
- The structure MUST reside in physically contiguous memory.

Context:

This function will not sleep, and hence can be executed in a context that does not permit sleeping.

Side-Effects:

None

Blocking:

No

Reentrant:

No

Thread-safe:

No

Parameters:

[in]	*pOpData*	Pointer to a structure containing the request parameters. The client code allocates the memory for this structure. This component takes ownership of the memory until it is returned in the callback, which was registered on the instance via **cpaDcDpRegCbFunc**. See the above Description for some restrictions that apply to this parameter.
[in]	*performOpNow*	Flag to indicate whether the operation should be performed immediately (CPA_TRUE), or simply enqueued to be performed later (CPA_FALSE). In the latter case, the request is submitted to be performed either by calling this function again with this flag set to CPA_TRUE, or by invoking the function **cpaDcDpPerformOpNow**.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_RETRY	Resubmit the request.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_RESTARTING	API implementation is restarting. Resubmit the request.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:

The session identified by pOpData->pSessionHandle was setup using **cpaDcDpInitSession**. The instance identified by pOpData->dcInstance has had a callback function registered via **cpaDcDpRegCbFunc**.

Postcondition:

None

Note:

A callback of type **CpaDcDpCallbackFn** is generated in response to this function call. Any errors generated during processing are reported as part of the callback status code.

See also:

cpaDcDpPerformOpNow

CpaStatus cpaDcDpEnqueueOpBatch (const **Cpa32U** *numberRequests*, **CpaDcDpOpData** * *pOpData*[], const **CpaBoolean** *performOpNow*)

Enqueue multiple requests to the compression data plane API.

This function enqueues multiple requests to perform compression or decompression operations.

The function is asynchronous; control is returned to the user once the request has been submitted. On completion of the request, the application may poll for responses, which will cause a callback function (registered via **cpaDcDpRegCbFunc**) to be invoked. Separate callbacks will be invoked for each request. Callbacks within a session and at the same priority are guaranteed to be in the same order in which they were submitted.

The following restrictions apply to each element of the pOpData array:

- The memory MUST be aligned on an 8-byte boundary.
- The reserved fields of the structure MUST be set to zero.

- The structure MUST reside in physically contiguous memory.

Context:
This function will not sleep, and hence can be executed in a context that does not permit sleeping.

Assumptions:
Client MUST allocate the request parameters to 8 byte alignment. Reserved elements of the CpaDcDpOpData structure MUST not used The CpaDcDpOpData structure MUST reside in physically contiguous memory.

Side-Effects:
None

Blocking:
No

Reentrant:
No

Thread-safe:
No

Parameters:

[in]	*numberRequests*	The number of requests in the array of CpaDcDpOpData structures.
[in]	*pOpData*	An array of pointers to CpaDcDpOpData structures. Each CpaDcDpOpData structure contains the request parameters for that request. The client code allocates the memory for this structure. This component takes ownership of the memory until it is returned in the callback, which was registered on the instance via **cpaDcDpRegCbFunc**. See the above Description for some restrictions that apply to this parameter.
[in]	*performOpNow*	Flag to indicate whether the operation should be performed immediately (CPA_TRUE), or simply enqueued to be performed later (CPA_FALSE). In the latter case, the request is submitted to be performed either by calling this function again with this flag set to CPA_TRUE, or by invoking the function **cpaDcDpPerformOpNow**.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_RETRY	Resubmit the request.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_RESTARTING	API implementation is restarting. Resubmit the request.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:
The session identified by pOpData[i]->pSessionHandle was setup using **cpaDcDpInitSession**. The instance identified by pOpData[i]->dcInstance has had a callback function registered via **cpaDcDpRegCbFunc**.

Postcondition:
None

Note:

Multiple callbacks of type **CpaDcDpCallbackFn** are generated in response to this function call (one per request). Any errors generated during processing are reported as part of the callback status code.

See also:
cpaDcDpEnqueueOp

CpaStatus cpaDcDpPerformOpNow (**CpaInstanceHandle** *dcInstance*)

Submit any previously enqueued requests to be performed now on the compression data plane API.

This function triggers processing of previously enqueued requests on the referenced instance.

Context:
Will not sleep. It can be executed in a context that does not permit sleeping.

Side-Effects:
None

Blocking:
No

Reentrant:
No

Thread-safe:
No

Parameters:
[in] *dcInstance* Instance to which the requests will be submitted.

Return values:

CPA_STATUS_SUCCESS	Function executed successfully.
CPA_STATUS_FAIL	Function failed.
CPA_STATUS_RETRY	Resubmit the request.
CPA_STATUS_INVALID_PARAM	Invalid parameter passed in.
CPA_STATUS_RESTARTING	API implementation is restarting. Resubmit the request.
CPA_STATUS_UNSUPPORTED	Function is not supported.

Precondition:
The component has been initialized via **cpaDcStartInstance** function. A compression session has been previously setup using the **cpaDcDpInitSession** function call.

Postcondition:
None

See also:
cpaDcDpEnqueueOp, **cpaDcDpEnqueueOpBatch**