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| **Data Plane Acceleration (DPACC)** |
| API Guidelines |
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# Basic Types

Linux type definitions shall be followed. For example int, u64, char etc. shall be used.

<https://www.kernel.org/doc/Documentation/CodingStyle>

<http://www.gnu.org/prep/standards/standards.html>

# API Naming convention

apitype\_acceleratorname\_acceleratortype\_operation\_commonname

* apitype
  + g for g-API
* acceleratorname
  + crypto
  + ipsec
  + pdcp
* acceleratortype (as defined in dpacc usecase[X])
  + la for lookaside model
  + in for inline model
  + dp for data path offload model
* operation
  + open
  + close
  + get
  + set
  + add
  + delete
  + find
  + process
  + notify
* commonname(s)
  + api\_version
  + active\_list

Example:

g\_ipsec\_la\_get\_api\_version

g\_pdcp\_la\_get\_api\_version

g\_ipsec\_la\_open

g\_pdcp\_la\_close

# Variable Naming convention

Naming convention for variables shall follow Linux style, readable and separated by underscore, when necessary.

# Function Arguments and Return Values

Return values SUCCESS or FAILURE.

For control or setup APIs that are used to setup states in the hardware accelerator it is preferable to use data structures to pass input and output parameters. While these setup or control functions do not come in the data path and hence do not impact performance, having parameters defined as structures enables extensibility in future without changing API prototypes. Structure introduced for passing in as parameters for functions shall have the function name as prefix and inargs/outargs as suffixes to indicate input and output arguments. For example, the input argument to g\_ipsec\_la\_sa\_add() would be g\_ipsec\_la\_sa\_add\_inargs and g\_ipsec\_la\_sa\_add\_outargs.

For data processing APIs, data structures are avoided in the packet processing calls and linear buffers are used with performance considerations in mind.

APIs shall also have flags to modify API behavior such as synchronous/asynchronous, response expected or not.

For example a set up API for setting up SAs would be as follows:

int g\_ipsec\_la\_sa\_add(

struct g\_ipsec\_la\_handle \*handle, /\* Accelerator handle \*/ const struct g\_ipsec\_la\_sa\_add\_inargs \*in, /\* Input \*/ enum g\_ipsec\_la\_control\_flags flags, /\* API flags \*/ struct g\_ipsec\_la\_sa\_add\_outargs \*out /\* Output \*/,

struct g\_ipsec\_la\_resp\_args resp /\* response callback in case

asynchronous mode with response flag is set \*/ );

In the above API, g\_ipsec\_la\_control\_flags and g\_ipsec\_la\_resp\_args are defined as follows:

enum **g\_ipsec\_la\_control\_flags**

{

G\_IPSEC\_LA\_CTRL\_FLAG\_ASYNC=1, /\* If Set, API call be asynchronous.

Otherwise, API call will be synchronous \*/ G\_IPSEC\_LA\_CTRL\_FLAG\_NO\_RESP\_EXPECTED=1, /\* If set, no response is

expected for this API call \*/

}**;**

struct **g\_ipsec\_la\_resp\_args**

{

struct g\_ipsec\_la\_resp\_cbfn cb\_fn;

/\* Callback function if ASYNC flag is chosen \*/

void \*cb\_arg;

int32\_t cb\_arg\_len; /\* Callback argument length \*/

}

Application can request the response to be returned synchronously or asynchronously (G\_IPSEC\_LA\_CTRL\_FLAG\_ASYNC). If the response is requested asynchronously, then the application should provide a callback function pointer and callback argument.

Also, in some scenarios, the API layer may have to do additional operations to force a response from the backend. The flag G\_IPSEC\_LA\_CTRL\_FLAG\_NO\_RESP\_EXPECTED can be used by application to indicate whether the application should force the response from the backend or not.

A packet processing API in the case of IPSec would be as follows:

Prototype:

int32\_t g\_ipsec\_la\_packet\_encap(

struct g\_ipsec\_la\_handle \*handle, struct g\_ipsec\_la\_control\_flags flags,

struct g\_ipsec\_la\_sa\_handle \*handle; /\* SA Handle \*/ uint32 num\_sg\_elem; /\* num of Scatter Gather elements \*/ struct g\_ipsec\_la\_data in\_data[];

/\* Array of data blocks \*/ struct g\_ipsec\_la\_data out\_data[];

/\* Array of output data blocks \*/ struct g\_api\_resp\_args resp)

All the enum should be declared to support the binary compatibility.

For ex:

enum g\_pdcp\_sn\_size

{

G\_PDCP\_SN\_SIZE\_5=5,

G\_PDCP\_SN\_SIZE\_7=7,

G\_PDCP\_SN\_SIZE\_12=12,

G\_PDCP\_SN\_SIZE\_15=15,

};

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