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| **Freescale Semiconductor** | Document |
| LDPAA AIOP SERVICE LAYER | Number: AIOPSLRN |
| Release Notes for LDPAA AIOP Service Layer Alpha v0.4 | Doc. Rev. 0.1 May. 15 2014 |

**LDPAA AIOP SERVICE LAYER ALPHA V0.4**

**Release Notes**

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1. Overview

This document describes the main updates included in the LDPAA AIOP Service Layer Alpha v0.4.

Alpha testing (i.e. verification of good flows on the simulator without error cases) has been conducted for functions described below.

Applications should use APIs in: aiopsl/src/include/

All other APIs are internal to the Service Layer and should not be called by applications.

In addition, note that:

* For spinlock, use only:
  1. lock\_spinlock
  2. unlock\_spinlock

All other spinlock functions will be removed in future release.

API may be changed in future releases.

API may be updated in future releases to align with the latest HW specs.

This release can be retrieved from GIT:

GIT repository: ssh://gerrit/ldpaa/aiopsl

GIT tag: **ldpaa-aiop-sl-v0.4**

Please see the aiopsl/docs/AIOPCoreLib\_ChangeLog.txt and aiopsl/docs/AIOP\_ARENA\_ChangeLog.txt files for a detailed list of changes.

The API documentation (.chm) may be downloaded from Compass at: <http://compass.freescale.net/livelink/livelink?func=ll&objId=230824100&objAction=browse&viewType=1>

Please subscribe to the AIOPSREL mailing list to receive future release notifications.

1. Compatibility List

This release is bit accurate with respect to the following docs/tools.

As such, it is suitable for running on RTL/Emulator and/or on the AIOP Simulator.

|  |  |
| --- | --- |
| **Tool/Doc** | **Version** |
| AIOP\_Archdef | 0.7.5 |
| FD\_section | 0.62.2 |
| CTLU\_AIOP\_bg | 0.7.2 |
| TMan | 0.59 |
| Parser\_Block\_Guide | 3.070 (spec version from 15/4/2014) |
| AIOP\_Instruction\_Additions | 1.00 |
| Compiler | Build 275 |
| CW for DPAA | 10.0.7 |
| Simulator | DPAA\_SWSIM\_RELEASE = DPAA\_SIM\_RELEASE\_0\_7\_0\_0101 + ctlu patch located at: http://gforge.freescale.net/frs/download.php/2041/LS2100\_SIM\_CTLU-20140418.tbz2 |
| MC Firmware | Alpha Release 0.3.2 |
| PowerISA | 2.06 |
| AIOP\_z490\_CPU\_Specification | Rev1.2 |

1. New Features in This Release

The main additions/changes in this version are (related to previous official v0.3 release):

**Arena:**

* Integration:
  + This version has been upgraded to run in an AIOP-MC integrated environment.  Please refer to the README file in  aiopsl\build\aiop\_t4ls\_sim\apps\app\_process\_packet\src for instructions on running the app\_process\_packet demo in this environment.
* Boot Features:
  + Multi-core boot is now supported.
  + AIOP initialization configures the number of tasks per core to 16. (Added in V0.3.update\_03)
  + Code can be placed in the iRAM or Shared SRAM using the \_\_HOT\_CODE and \_\_WARM\_CODE attributes.  
    (HOT\_CODE added in V0.3.update\_03)
  + Global variables can be placed in the Shared SRAM using the \_\_SHRAM attribute   
    (Added in V0.3.update\_03)
  + Added support for small data sections.    
    (Added in V0.3.update\_02)
* Memory Management:
  + Added Slab API for incrementing/decrementing reference counts. (Added in V0.3.update\_02)
  + The current ARENA version allocates BMan pool IDs 1-11 to the AIOP as defined by the SLAB\_BPIDS\_ARR. Applications must not use these BMan pool IDs.   
    (This is a temporary solution until user-controlled BMan pool initialization is supported.)  
    (Added in V0.3.update\_02)
* Network Interface Management
  + Added support for DPNI object discovery and enablement.   
    (Added in V0.3.update\_01)
  + Added support for setting/getting the receive and send NI IDs.   
    (Added in V0.3.update\_01)
  + Added support for querying a DPNI MAC address.   
    (Added in V0.3.update\_01)
  + Added support for DPNI callback de-registration.   
    (Added in V0.3.update\_01)
* Console IO:
  + UART is now supported using UART0.
  + UART support has been adapted for multi-core.
  + Service Layer print messages are debug-level sensitive.
* Network Utilities:
  + Added ntohs, ntohl, htons, htonl APIs.   
    (Added in V0.3.update\_02)

**Service-Layer:**

* Compatible with 0.7.5 ArchDef. The following CDMA functions were updated:
  + The size was removed from the acquire command.
  + The refcount was increased to 32 bits.
* Comply with CTLU spec 0.7.2, Parser 3.070 spec and TMan 0.59 spec.
* CDMA
  + Moved 4 CDMA functions from fsl\_cdma.h into cdma.h.
  + Added Slab API for incrementing/decrementing reference counts.
* FDMA
  + Added the following FDMA SR functions: fdma\_close\_segment(), fdma\_delete\_segment\_data() and fdma\_discard\_fd().
* Parser
  + Changed input to parser\_profile\_create() and parser\_profile\_replace() to be parse\_profile\_input struct (according to HW struct).
* TMan
  + Added mask to the return status of the tman timer query function.
  + Fixed in Timer query return status codes.
* Added call to ARENA's function slab\_find\_and\_fill\_bpid() for handling:
  + Parser and KeyGen pool ID creation.
  + Storage Profile buffers – 300 buffers of 2048 bytes.
  + IPR context and instance buffers – 300 buffers of 2688 bytes.
* Table SRs:
  + table\_lookup\_by\_keyid was renamed to table\_lookup\_by\_keyid\_default\_frame.
  + table\_lookup\_by\_keyid was introduced, supporting non default parameters.
  + Table statuses were updated.
  + Removed ICID Error status.
  + Added function specific return values documentation.
* Added the following IPR functionality:
  + IPR is not limited to only 2 fragments and IPv4 checksum generation is supported.
  + Out of order.
  + IPv6 support.
  + Concurrent mode support.
* Added the following GRO functionality:
  + Added GRO functionality for any number of aggregated packets and Packet limit size.
  + Timeout limit.
  + IPv4 checksum.
  + TCP checksum.
  + IPv4 ECN.
  + IPv4 timestamp.
  + IPv6.
  + Metadata.
  + TCP flags.
  + Unexpected sequence number.
  + Unexpected Ack number.
  + Granularity field to timeout parameters.
* Added the following IPF functionality:
  + ipf\_discard\_frame\_remainder.
  + IPv4 options headers.
  + IPv4 fragmentation of fragments.
  + IPv6 ID.
* Network Interface
  + Added call to terminate task at the end of function receive\_cb().
* Alpha verification for functions listed in section 7.

1. Quick Start with this release

Please see the README.txt file at aiopsl\build\aiop\_t4ls\_sim\apps\app\_process\_packet\src\ for running instructions.

Important Note:

Due to the added support for \_\_SHRAM, the following fields must be placed in the Shared Ram GROUP in the lcf file

.shdata (DATA) : {}

.shbss (BSS) NO\_INIT\_BSS : {}

Due to the added support for \_\_HOT\_CODE, the following fields must be placed in the iRam GROUP in the lcf file:

 .itext (TEXT) ALIGN(0x1000): {}

 .itext\_vle (VLECODE) ALIGN(0x1000): {

         \*(.itext)

         \*(.itext\_vle)

 }

Please refer to aiopsl\build\aiop\_t4ls\_sim\cw\_files\aiop\_link.lcf as an example.  In addition, note that currently, the shared\_ram region starting from org = 0x01010000, len = 0x00030000 is reserved for heap allocation (malloc) and should not be used for static variable allocations.

1. Contact Information

* Mail List: **AIOPSREL**
* Bug Reporting [Clear Quest](http://cq.freescale.net/cqweb/) BINs: **LS-AIOP-LOW-LEVEL** and **LS-ARENA**

1. Bug Fixes

The following bugs have been fixed in this version:

* fsl\_os\_xmalloc() is now operational at run-time for all memory targets (ENGR00313297).
* Slab\_acquire success after slab pool is freed (ENGR00307828).
* Slab\_release() does not decrement reference count.  (ENG00303738)
* Fixed ENGR310243 and ENGR310688 (KeyGen related).

1. Known Limitations/ Issues

## General Limitations

* Multi-core support is currently limited to the boot process only.  Run time ARENA code is not yet fully adapted to a multi-core environment.
* The fsl\_os\_print() function is limited to strings smaller than 128 characters.
* The current ARENA version allocates BMan pool IDs 1-11 to the AIOP as defined by the SLAB\_BPIDS\_ARR. Applications must not use these BMan pool IDs.
* Slab creation does not support additional buffers beyond the committed number (i.e. only extra\_buffs=0 is currently supported).
* Parse profile ID is set to “0” as default. Other Parse Profile IDs cannot be used.
* IPR table location is set to PEB only.

## Known problems

* The slab\_debug\_info\_get() command does not check the validity of the slab being queried.  (ENG00312975)
* Reading TMAN TimeStamp value in not supported (An inquiry is done by the HW team see ENGR00290447).
* GRO TCP checksum is not supported (ENGR00313276).

## Tools known issues

The below are known simulator issues which cause limitations in the Service Layer.

* OSM inhibit bit is incorrectly set. (ENGR00310944)
* Unable to test multi-cluster ELF loader.  (ENGR00313161).
* Work Scheduler is always enabled by default.  (ENGR00313165)

CTLU:

* Suspect simulator issue in table\_get\_miss\_result command. (ENGR306553).
* Table\_get\_params issue in case of table create with MR. (ENGR00308387).
* The address issue in Reference Pointer (RPTR) while increase Reference counter in table look up. (ENGR00308981).
* Zero keysize issue in get miss miss result in LPM table. (ENGR309657).
* Zero keysize issue in replace miss result in LPM table. (ENGR00310008).
* Suspect issue that the miss rule can not be found in table with miss result. (ENGR00310040).
* The covered instructions show not covered in coverage report. (ENGR00312494).
* Issue in LPM table lookup by keyed. (ENGR00313122).
* Query miss with large keys in rule query testing. (ENGR00313464).

IPR:

* Padding not supported due to Simulator. (ENGR310910).
* IPv6 not supported due to Simulator (ENGR00312273 & ENGR00312444).
* Scatter/Gather not supported due to Simulator (ENGR305821).

IPF:

* + IPv6 is not supported due to the following simulator issues:
    - FDMA replace command didn't fetch data from cache . (ENGR307965).
    - Extension header(IPv6 fragments) haven't been parsed correctly. (ENGR311002).
  + Fragment restoration feature is not supported since Split by SF is not supported by simulator (ENG00313806).

KeyGen:

* Extraction of user metadata in keygen\_gen\_key command is not supported due to simulator issue (ENGR311650).

GSO:

* The simulator does not calculate TCP checksum (CR ENGR306403, see below for L4 checksum). The simulator does not calculate TCP checksum (CR ENGR306403, see below for L4 checksum).

L4 checksum:

* Generate parse result command problem (ENGR00306403).

GRO:

* GRO can run with one frame only (ENGR311215).

IPSec (not functional due to simulator):

* + Simulator exit upon encryption (ENGR309515).
  + SEC / CAAM - IPsec AESHA DESHA - Invalid Key1 Length (ENGR304467).
  + SEC / CAAM - IPsec protocol works without C2KEY (ENGR00308342).
  + SEC / CAAM - invalid SHRD condition (ENGR00308345).
  + Decryption frame stuck (ENGR311680).
  + IPsec PDB decap error (ENGR313035).

SG after frame concatenation (IPR/GRO) or as input to any FM function is not supported (ENGR305821).

The below are known tools issues which cause limitations in the Service Layer.

Arena:

* It is not currently possible to run single-core due to tool limitation due to tool issue.

1. Verification

Attached is an xls including verification status.



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