MARVELL

Data plane Workload Accelerator(DWA)

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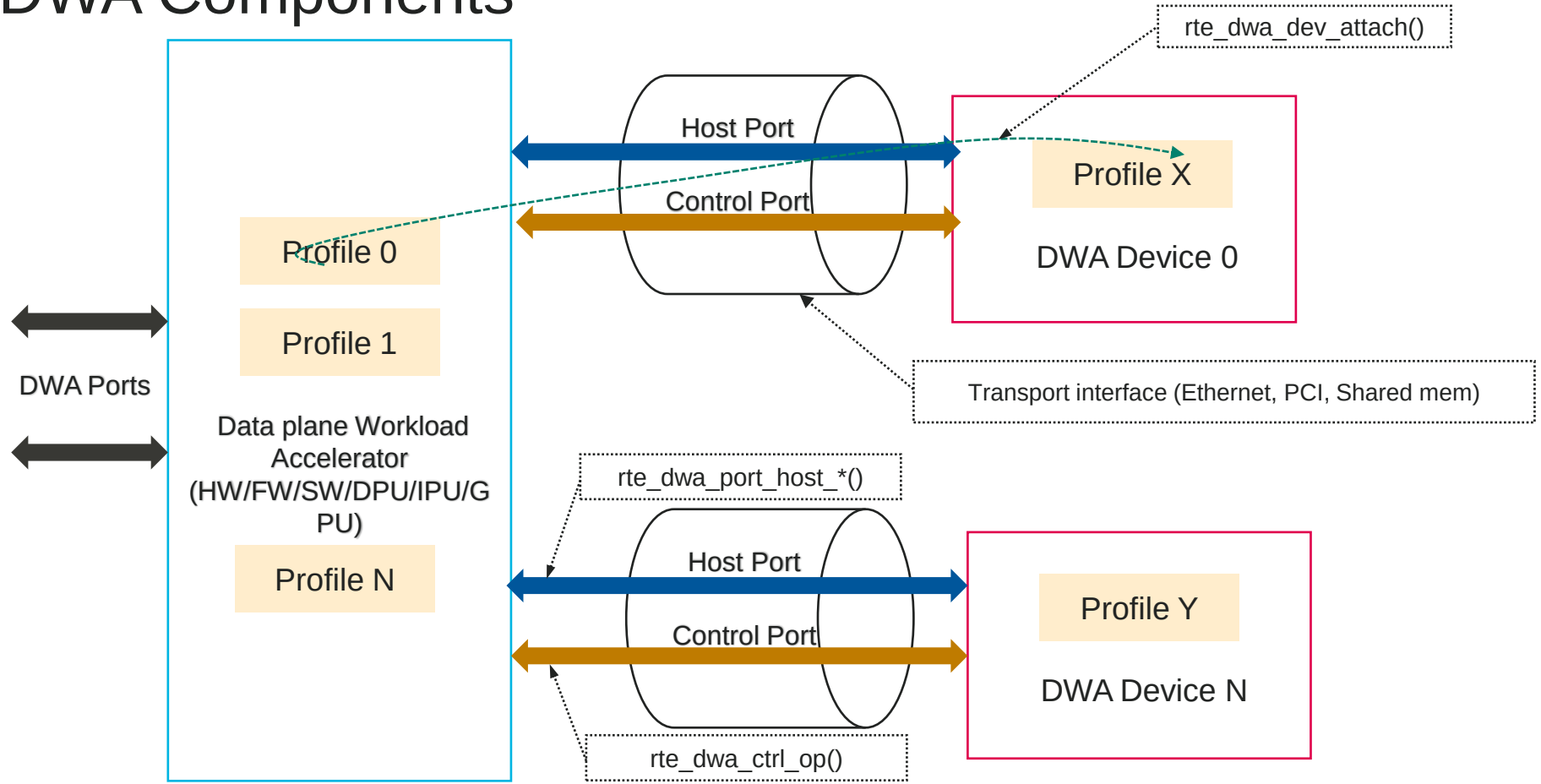
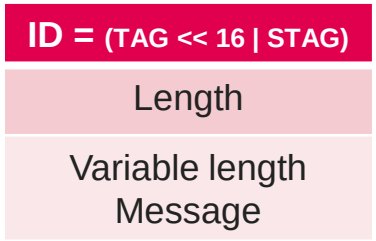
DWA Components



Components Definition - 1

- Transfer data as TLV



- Control Port
  - Transferring Control plane messages
  - Synchronous
  - Available per DWA device

Components Definition - 2

- Host port
  - Used for transferring User Plane TLVs
  - Decouple User Plane TLVs with Transport mechanism differences
  - Example Host ports
    - Ethernet
    - PCIe (DMA style)
    - Shared Mem
  - Asynchronous transfers unlike control port
- DWA Port
  - Data comes from external source to process by DWA
  - Unlike Host port, Host CPU not involved in feeding data to DWA
  - Example DWA Ports
    - Ethernet
    - ECPRI

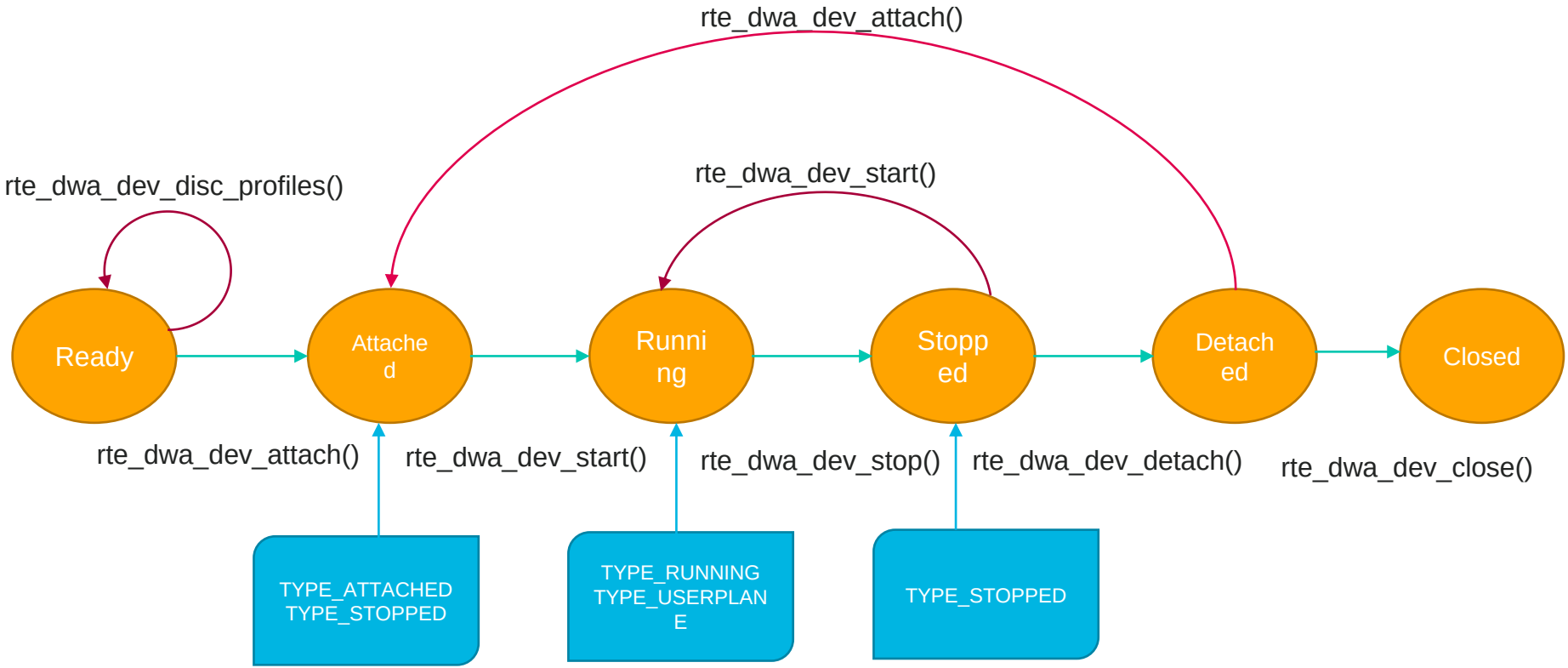
TLV - Type

- Host to DWA
  - Specified as H2D
  - Used for requesting DWA to do certain action
- DWA to Host
  - Specified as D2H
  - Notifying H2D action completed, or any other action from DWA

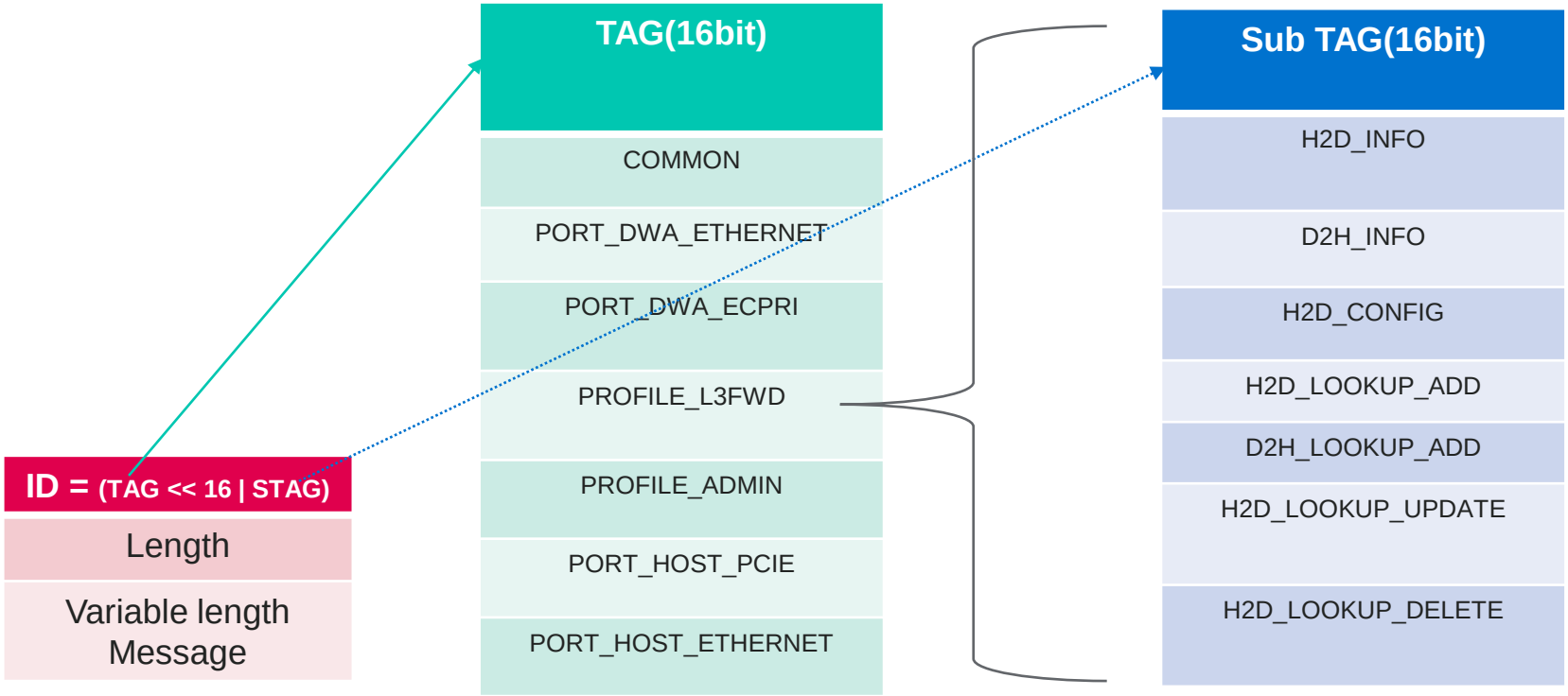
TLV Attributes and DWA State

State name	Comments	Valid Message Type
STATE_ANY	Message transferred at any time	TYPE_ATTACHED TYPE_STOPPED TYPE_RUNNING
STATE_STOP	Message transferred after *rte_dwa_dev_attach()* or after *rte_dwa_stop().* But not after *rte_dwa_start()*	TYPE_STOPPED
STATE_START	Message transferred after *rte_dwa_start()*	TYPE_RUNNING
USER_PLANE	Message transferred after *rte_dwa_start()* and transferred via Host port, not via control port	TYPE_USERPLANE

State machine



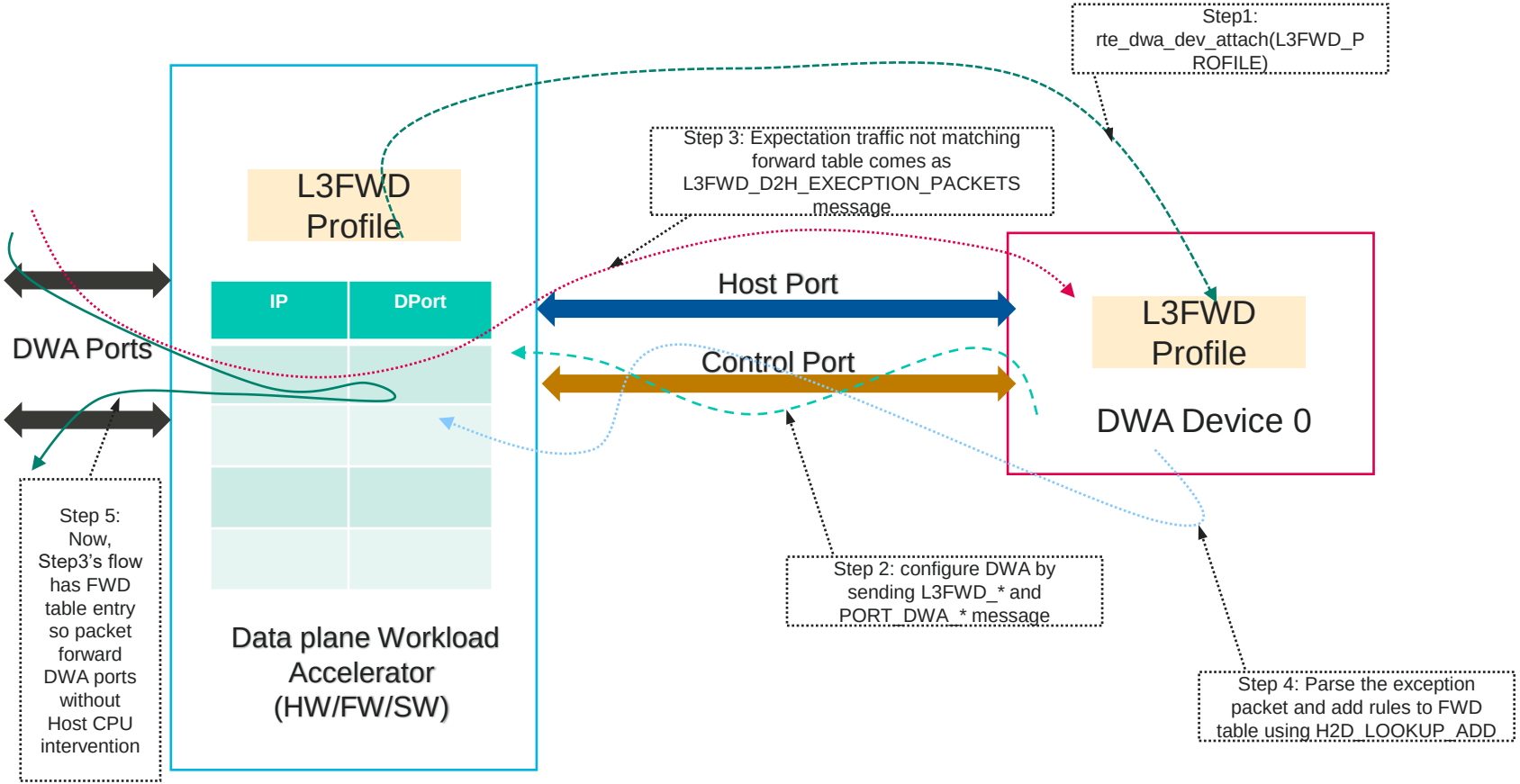
TLV - Layout


TAG(16bit)
COMMON
PORT_DWA_ETHERNET
PORT_DWA_ECPRI
PROFILE_L3FWD
PROFILE_ADMIN
PORT_HOST_PCIE
PORT_HOST_ETHERNET
Sub TAG(16bit)
H2D_INFO
D2H_INFO
H2D_CONFIG
H2D_LOOKUP_ADD
D2H_LOOKUP_ADD
H2D_LOOKUP_UPDATE
H2D_LOOKUP_DELETE
ID = (TAG << 16 | STAG)
Length
Variable length Message

Putting all together – Example TLV

TAG	STAG	Type	Attribute	Payload	Response TAG/STAG
PROFILE_L3FWD	H2D_INFO	H2D	STATE_ANY	No	PROFILE_L3FWD /D2H_INFO
PROFILE_L3FWD	D2H_INFO	D2H	STATE_ANY	struct rte_dwa_profile_l3fwd_d2h_info { uint32_t max_lookup_rules; uint16_t modes_supported; uint16_t nb_host_ports; uint16_t host_ports[]; } __rte_packed;	NA

L3FWD offload realization using DWA framework



Where is the code?

- Based on DPDK RFC
  - http://mails.dpdk.org/archives/dev/2021-October/226070.html
  - https://patches.dpdk.org/project/dpdk/patch/20211019181459.1709976-2-jerinj@marvell.com/

- Current status:
  - TB approved the DWA library to be part of dpdk.org
    - https://lore.kernel.org/all/CALBAE1O+uo=V-R3TZah+mpXLV9BtLPkCrc-NkgU0=asJEaKDdw@mail.gmail.com/T/
  - Planning to send implementation with L3FWD profile