



DPDK

DATA PLANE DEVELOPMENT KIT

Use DPDK to accelerate data compression in SPDK

FIONA TRAHE, INTEL

PAUL LUSE, INTEL

JIM HARRIS, INTEL

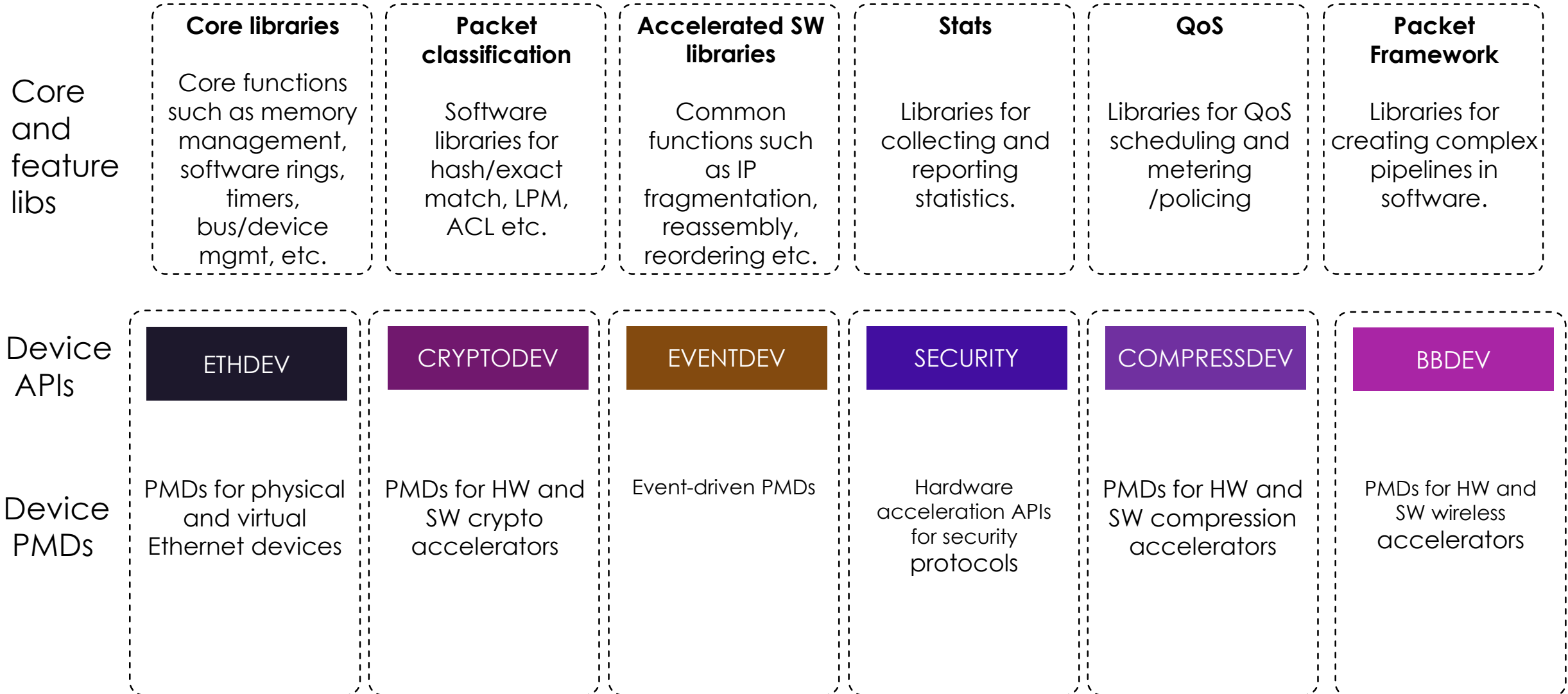
Agenda

- Overview of DPDK and its compressdev infrastructure
- Overview of SPDK and how it uses DPDK
- Creating a compression device with SPDK's new reducelib, vbdev and compressdev



DPDK compressdev overview

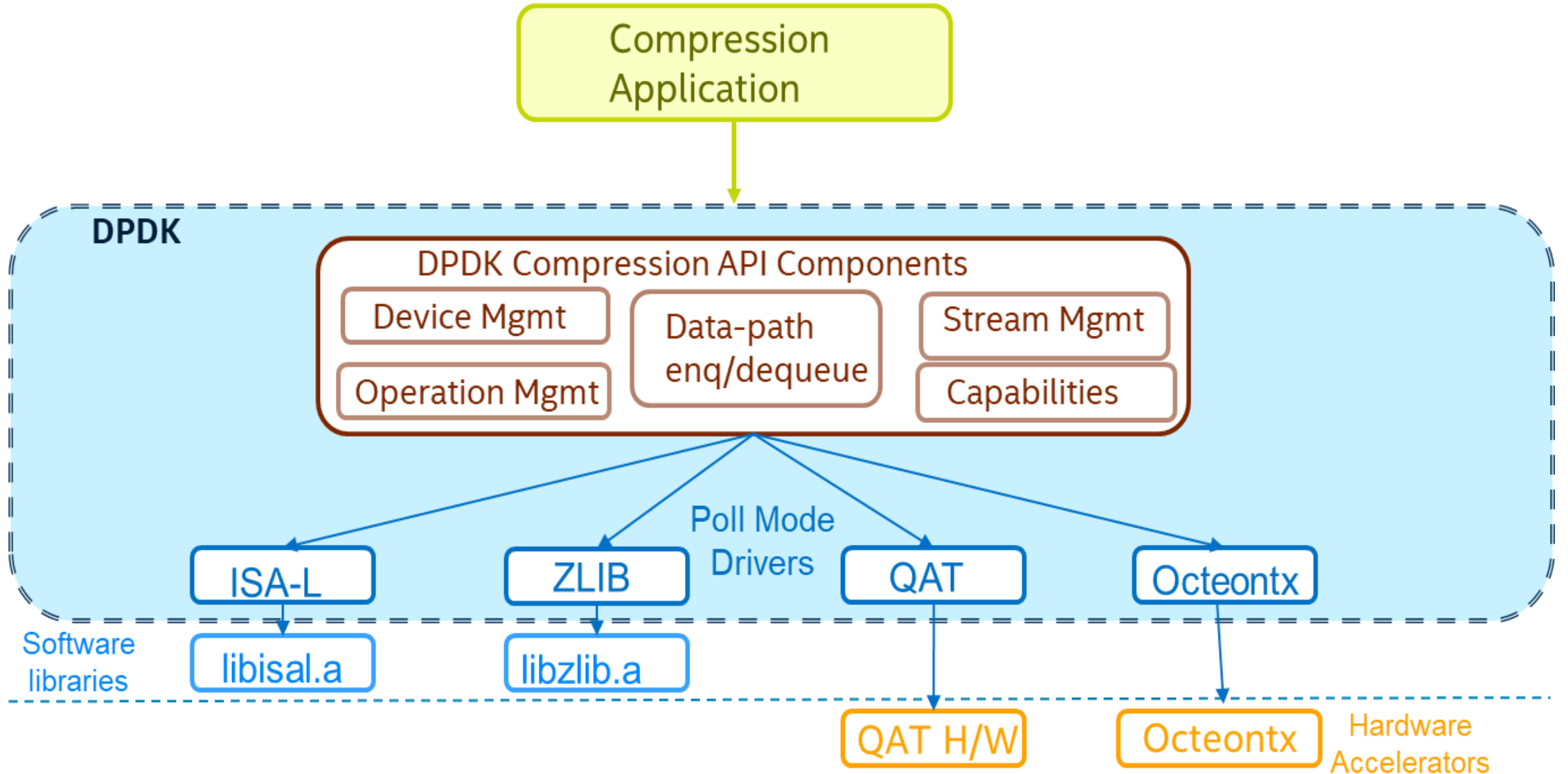
DPDK libraries



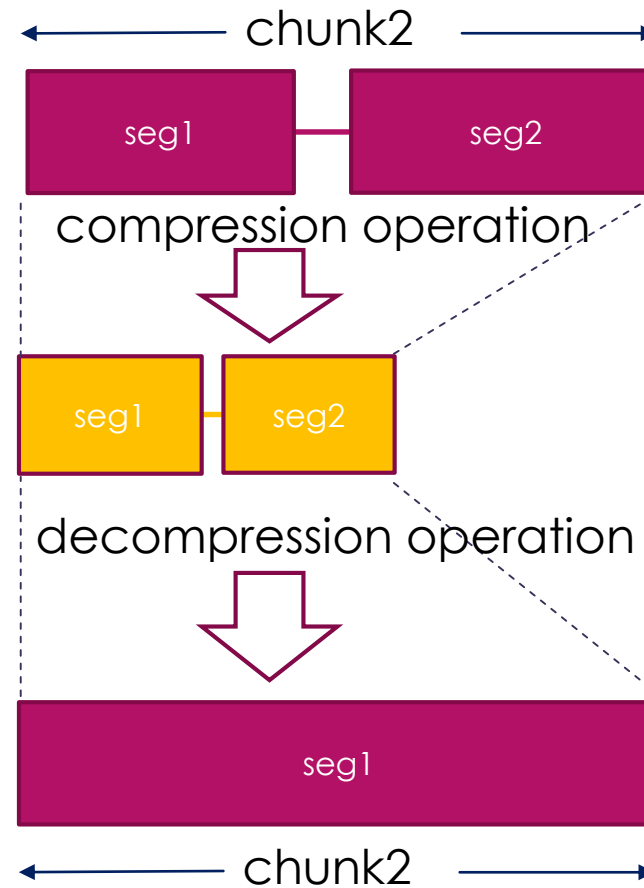
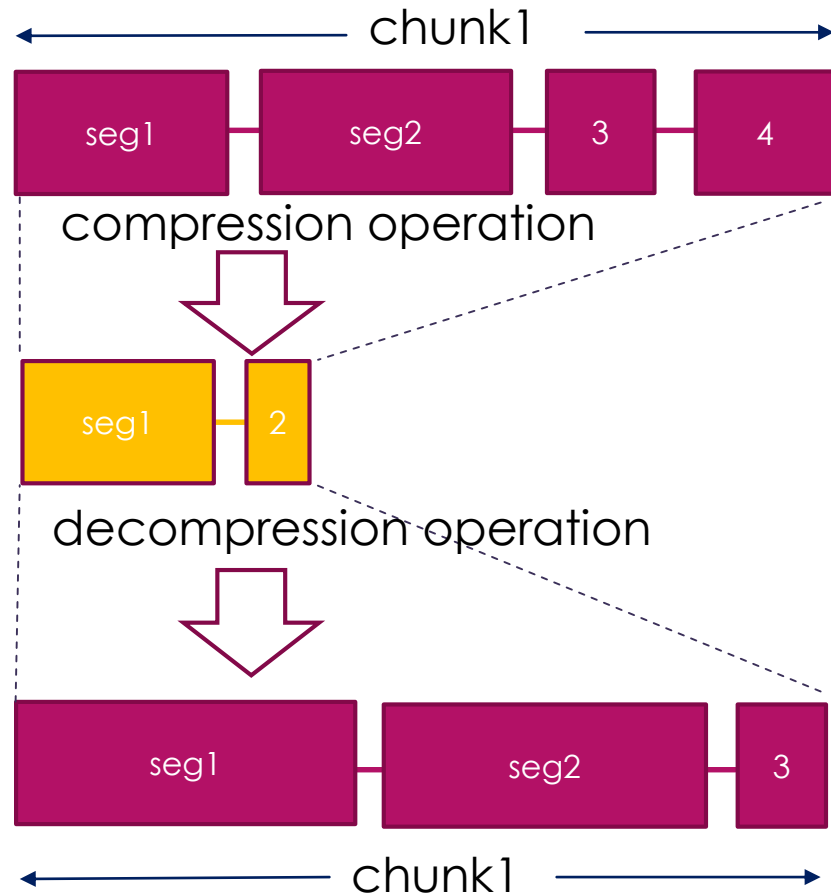
dpdk/compressdev key features

Asynchronous burst API	Chained mbufs	compression Algorithms	Compression Levels	Checksum	Hash Generation
To support HW & SW acceleration	To allow compression of data greater than 64K-1. Can attach external data buffers to mbufs.	<ul style="list-style-type: none">• Deflate• LZS	<ul style="list-style-type: none">-1: PMD default1: Fastest...9: Best Ratio	<ul style="list-style-type: none">○ CRC32○ Adler32○ Combined Adler32_CRC32	<ul style="list-style-type: none">• SHA1• SHA256

compressdev components



Stateless compression with SGLs



- A chunk passed in or out of an operation may be comprised of one or more buffers (segments) chained together.
- Segments can be any size < 64k.
- There is no correlation between the number of segments passed in for compression and the number of segments it will decompress to.

Find out more about compressdev

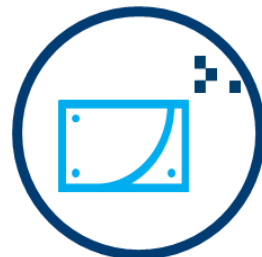
- compressdev home on dpdk.org
http://doc.dpdk.org/guides/prog_guide/compressdev.html
- compressdev poll mode drivers
<https://doc.dpdk.org/guides/compressdevs/index.html>
- Deflate your data with DPDK – presentation from DPDK Dublin summit
https://www.snia.org/sites/default/files/SDC/2018/presentations/DPCO/Trahe_F_Daly_L_Deflate_Your_Data_with_DPDK.pdf

SPDK overview

What is SPDK?

Storage Performance Development Kit

Available via spdk.io



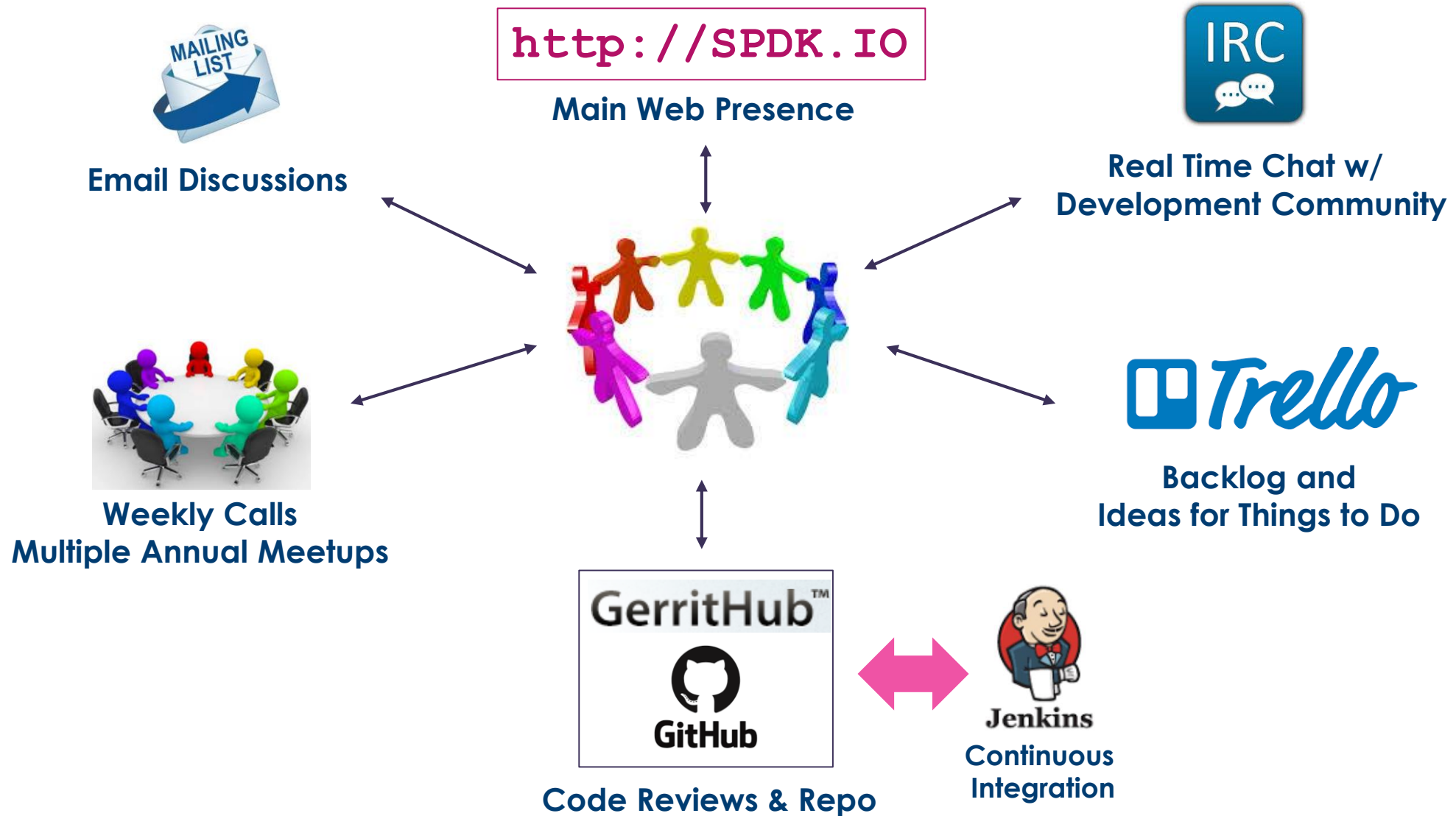
Open Source Software

- Optimized for latest generation CPUs and SSDs
- Software building blocks (BSD licensed)
- Designed to extract maximum performance from non-volatile media

Scalable and Efficient Software Ingredients

- User space, lockless, polled-mode components
- Up to millions of IOPS per core
- Minimize average and tail latencies

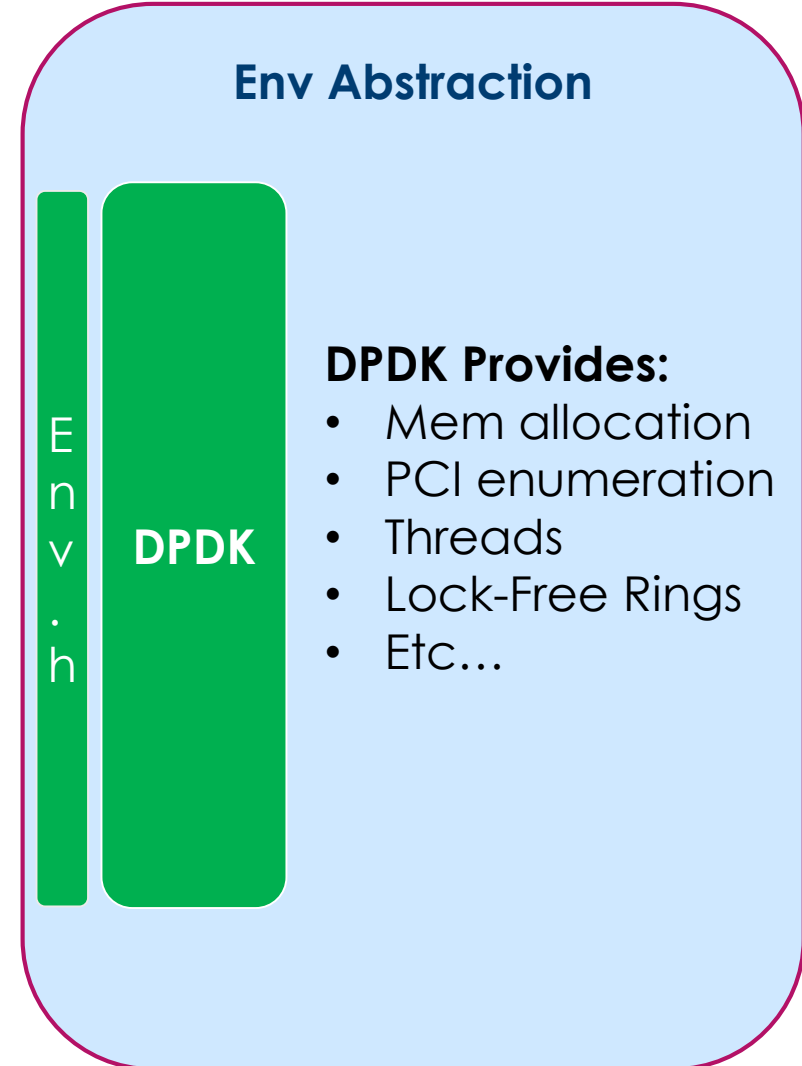
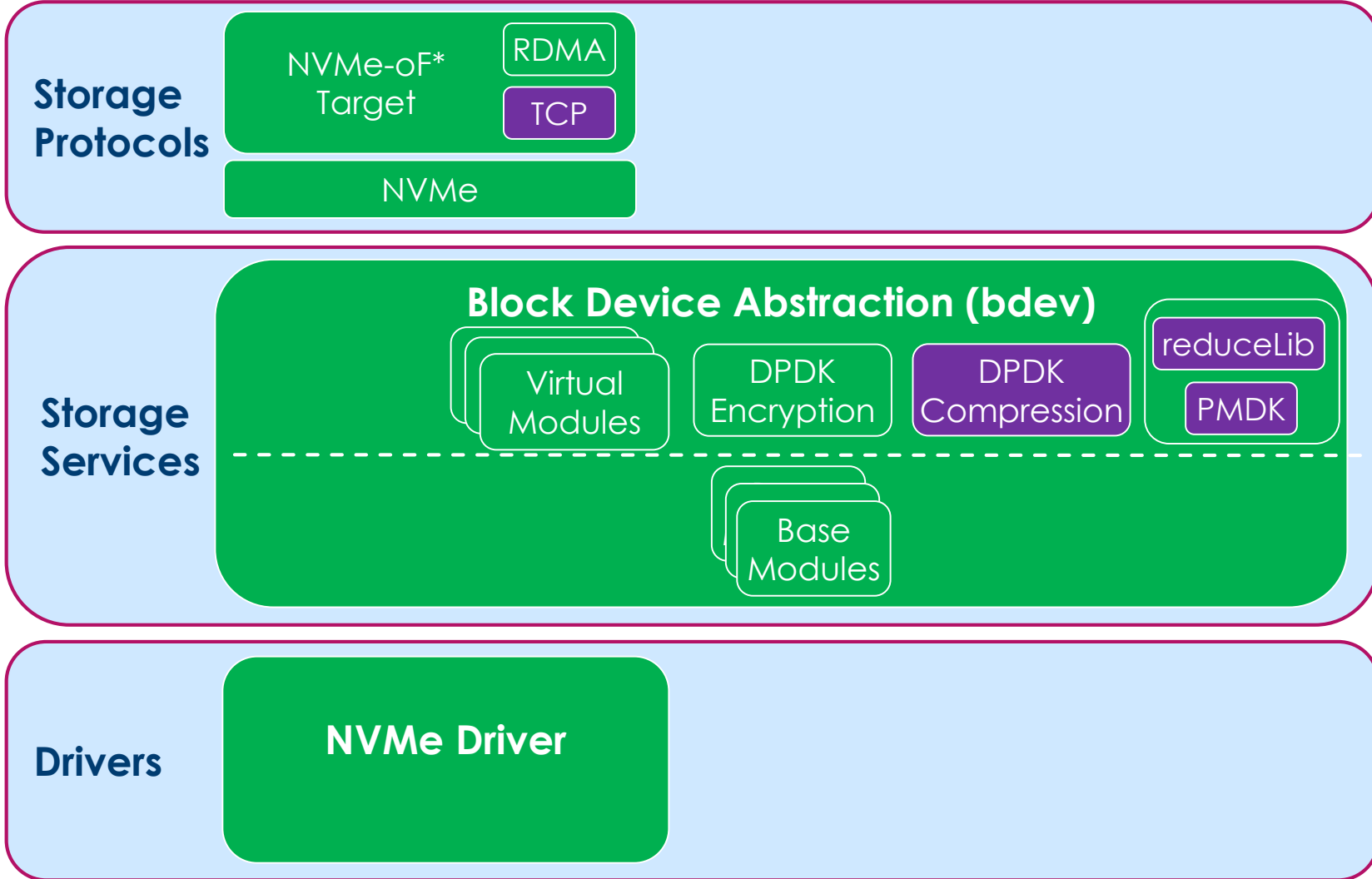
SPDK Community



SPDK High Level Architecture*

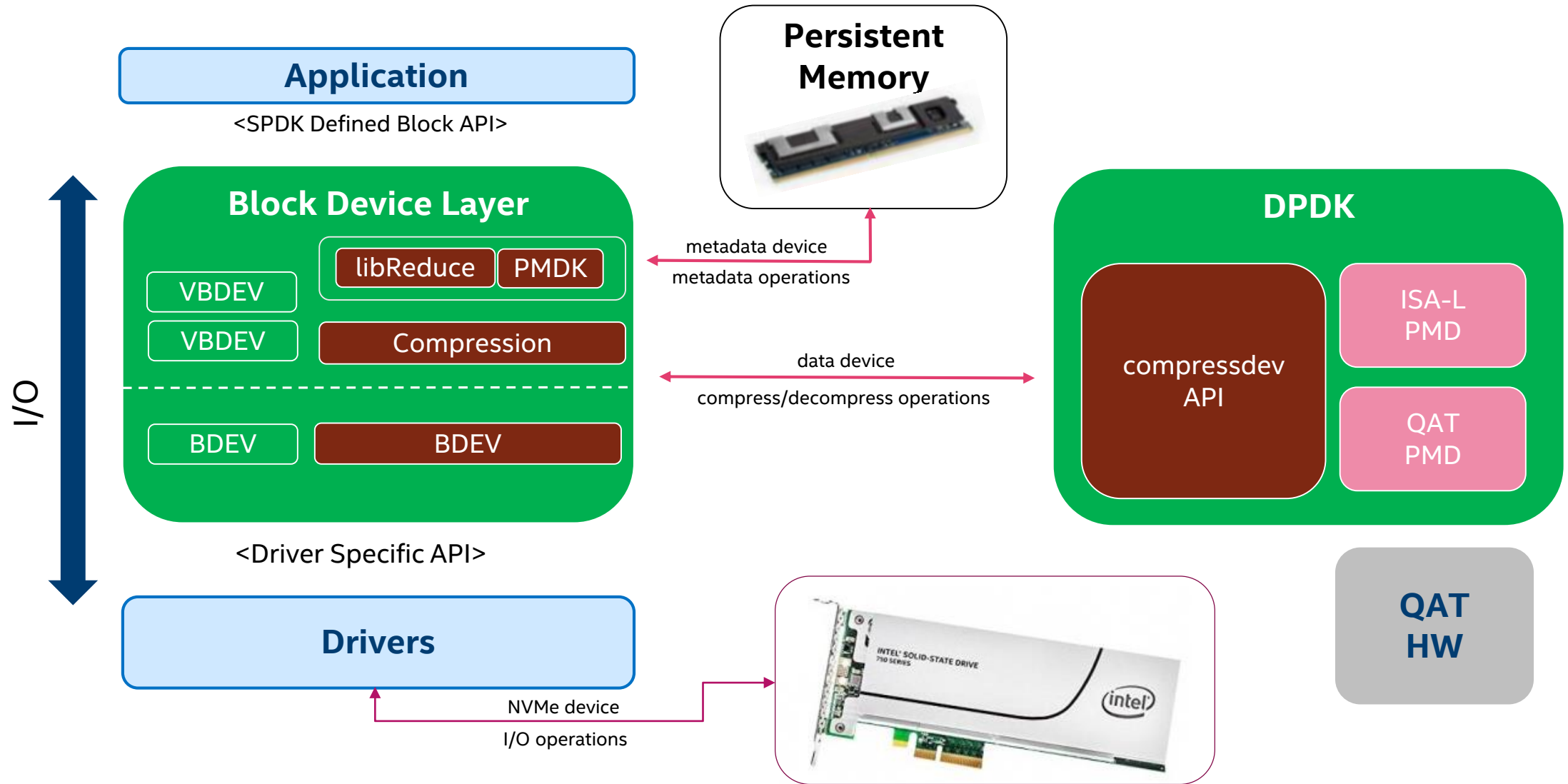
*simplified to just the modules relevant to this presentation

Released
In Progress

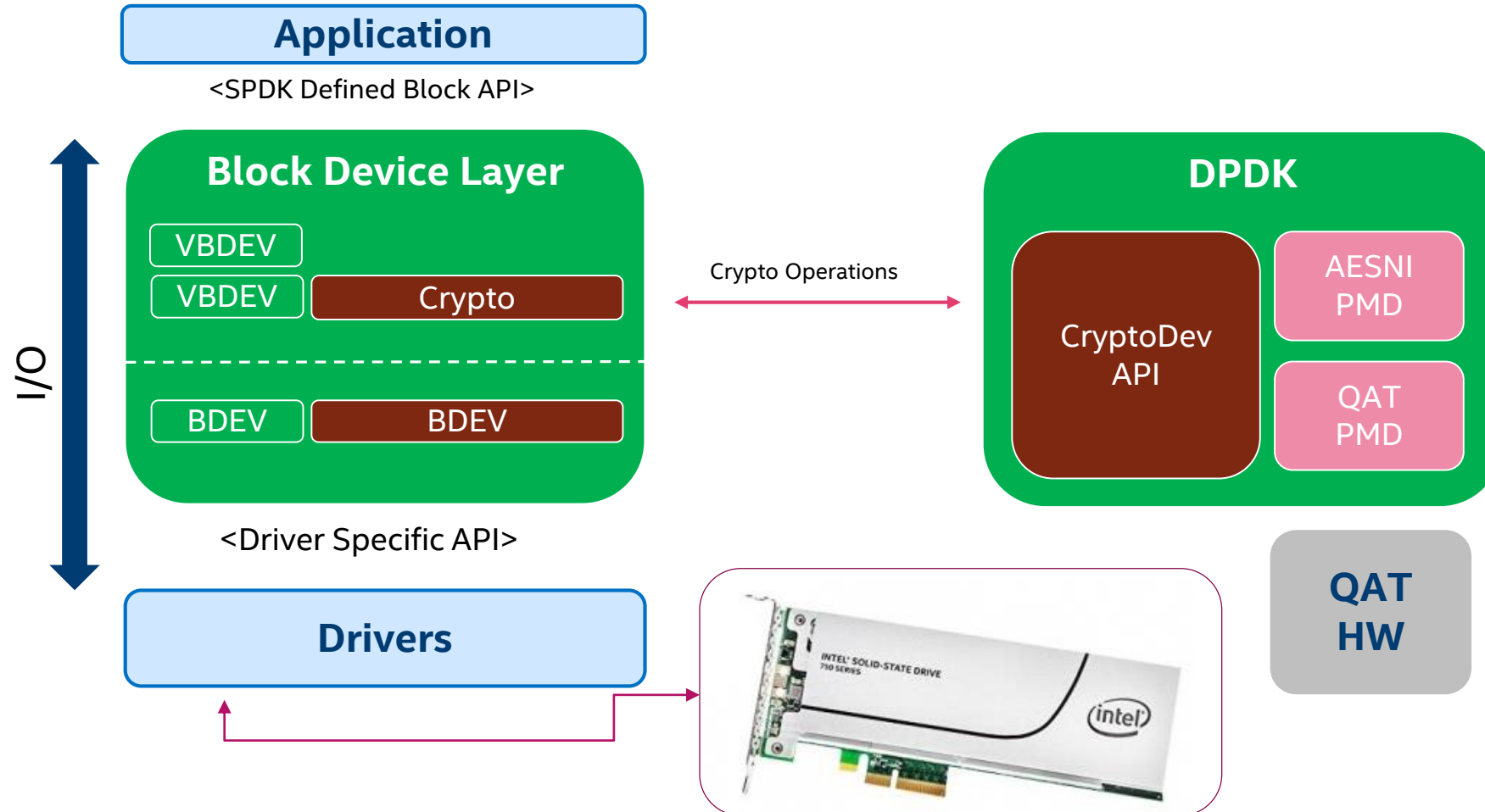


Creating a compression device in SPDK

The Compression Vbdev module



The Crypto Vbdev Module



Find out more

- SPDK home

<https://spdk.io/>

- The secret to customizing SPDK: (all about Virtual BDEVs)

https://www.snia.org/sites/default/files/SDC/2018/presentations/SSS_NVM_PM_NVDIMM/Luse_P_Trahe_F_Virtual_BDEVs_The_Secret_to_Customizing_SPDK.pdf

- PMDK - persistent memory development kit

https://ci.spdk.io/download/events/2018-summit/day1_10_LusePMDKSPDK.pdf

Get involved in the development

- compressdev vbdev (WIP)

<https://review.gerrithub.io/c/spdk/spdk/+429395>

- libreduce design (WIP)

<https://review.gerrithub.io/c/spdk/spdk/+430385>

BACKUP

SPDK ARCHITECTURE

Released

In Progress

DATA PLANE DEVELOPMENT KIT

