

storage performance development kit Overview

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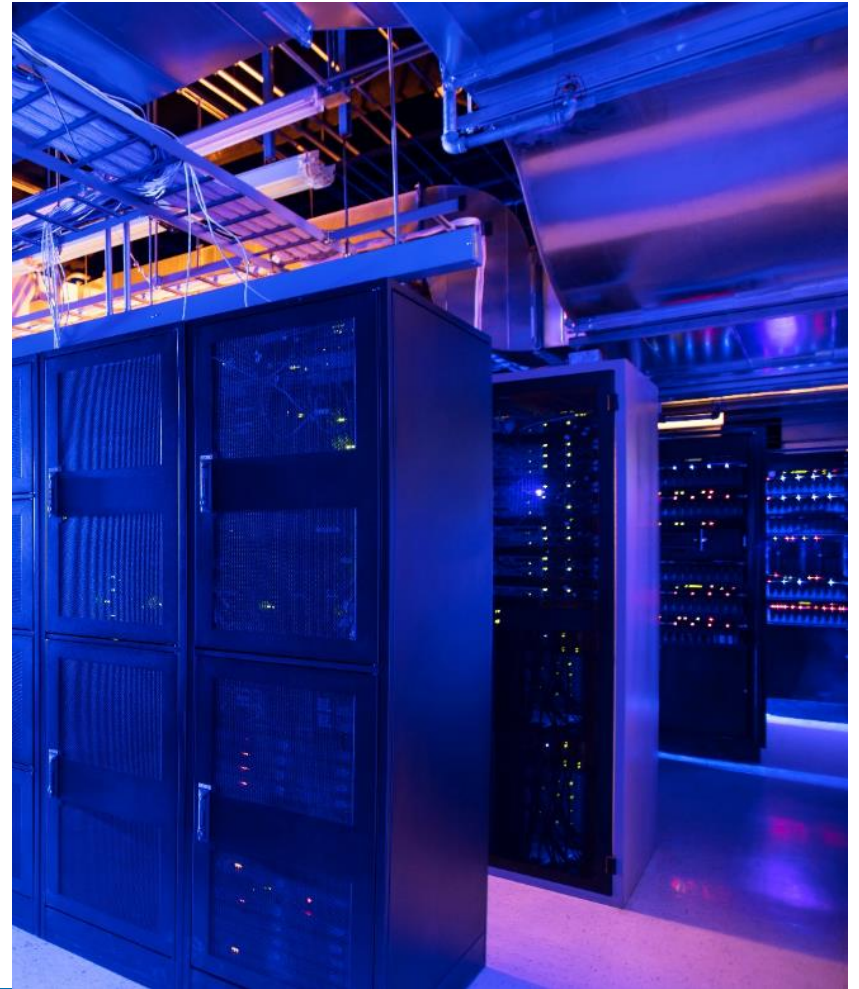
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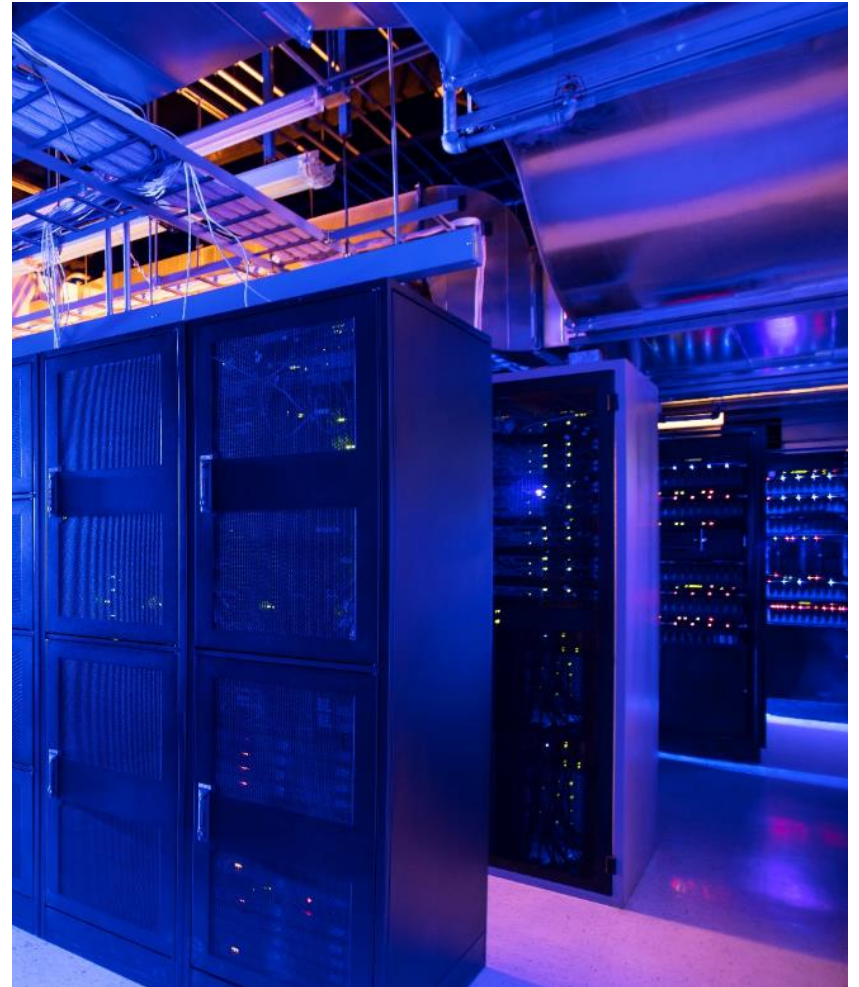
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Agenda

- Introduction
- Community
- Overview of Components



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What is SPDK?

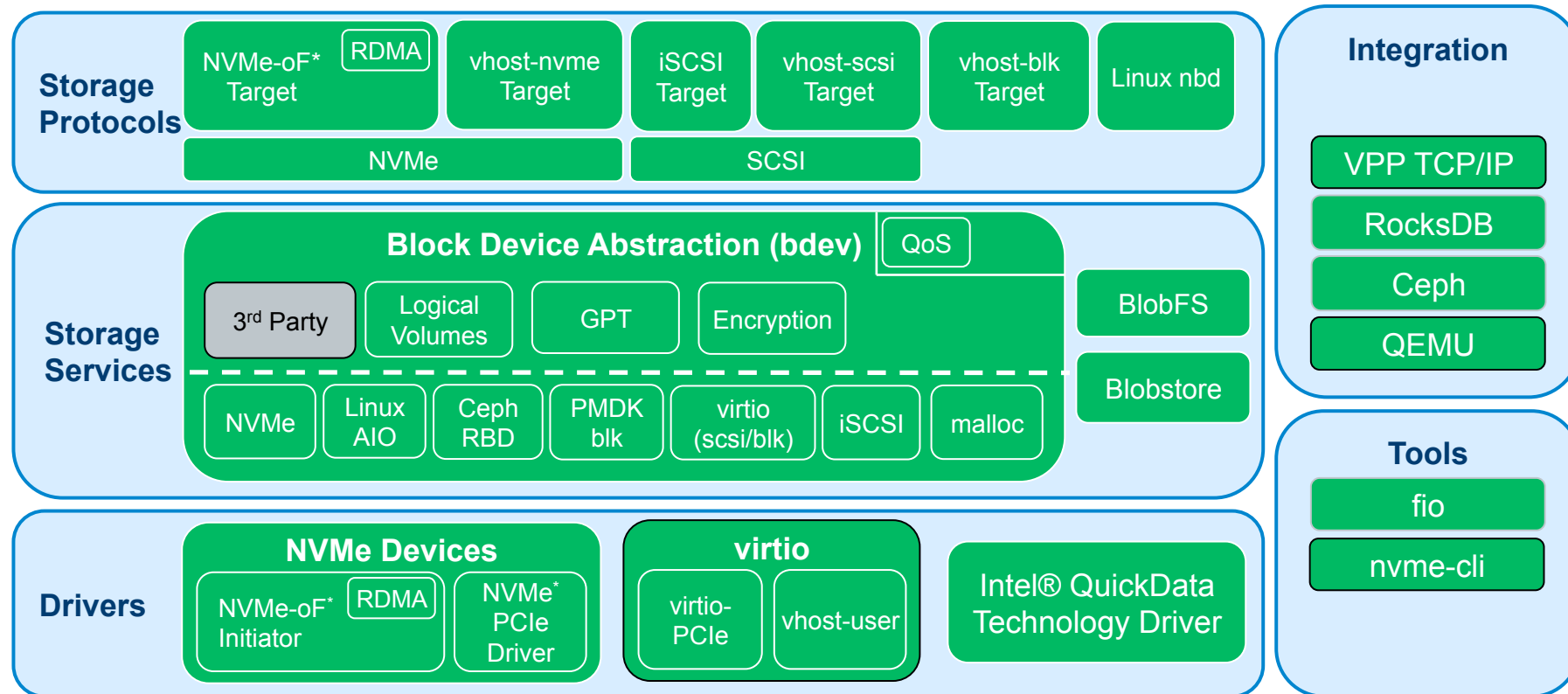
Storage Performance Development Kit

Open Source, BSD Licensed

<http://spdk.io>

User-space Drivers and Libraries for Storage, Storage Networking and Storage Virtualization

SPDK Architecture



SPDK and Kernel

SPDK has better performance and efficiency compared to interrupt-driven approaches

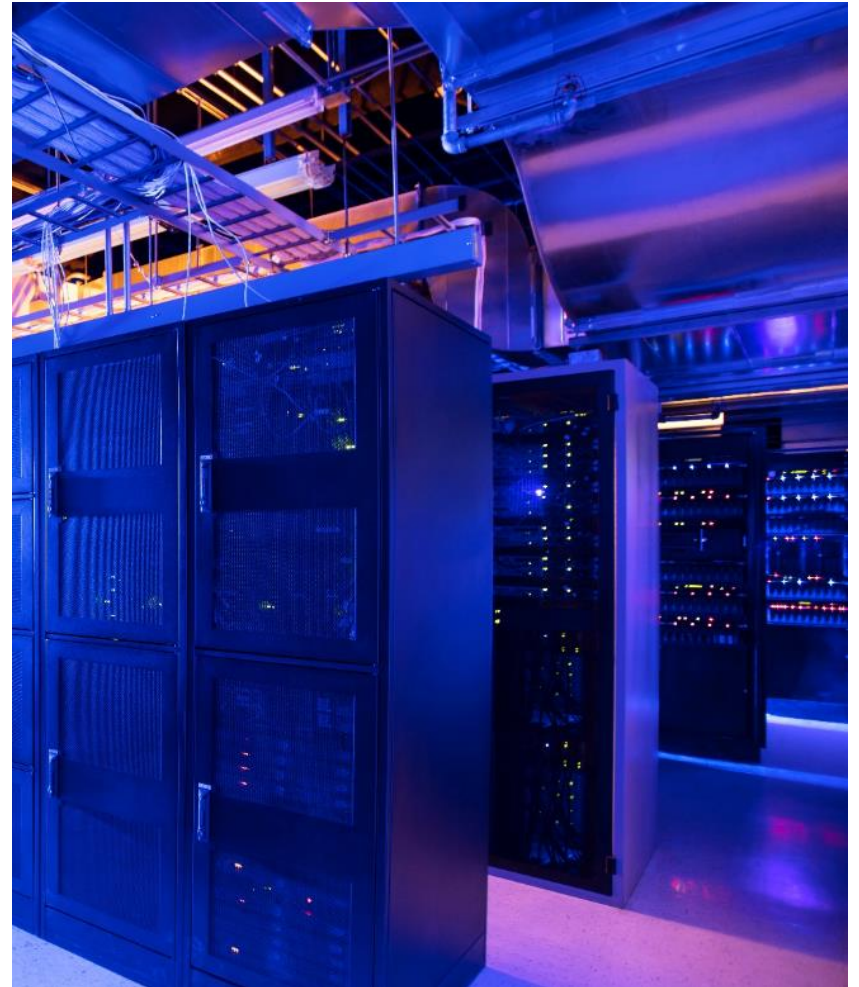
BUT...

SPDK is not a general-purpose solution

- Covers some use cases very well – others not at all (or at least not well)

Polling, shared-nothing, message passing, and zero copy drove all aspects of SPDK's design

- Introduction
- **Community**
- Overview of Components



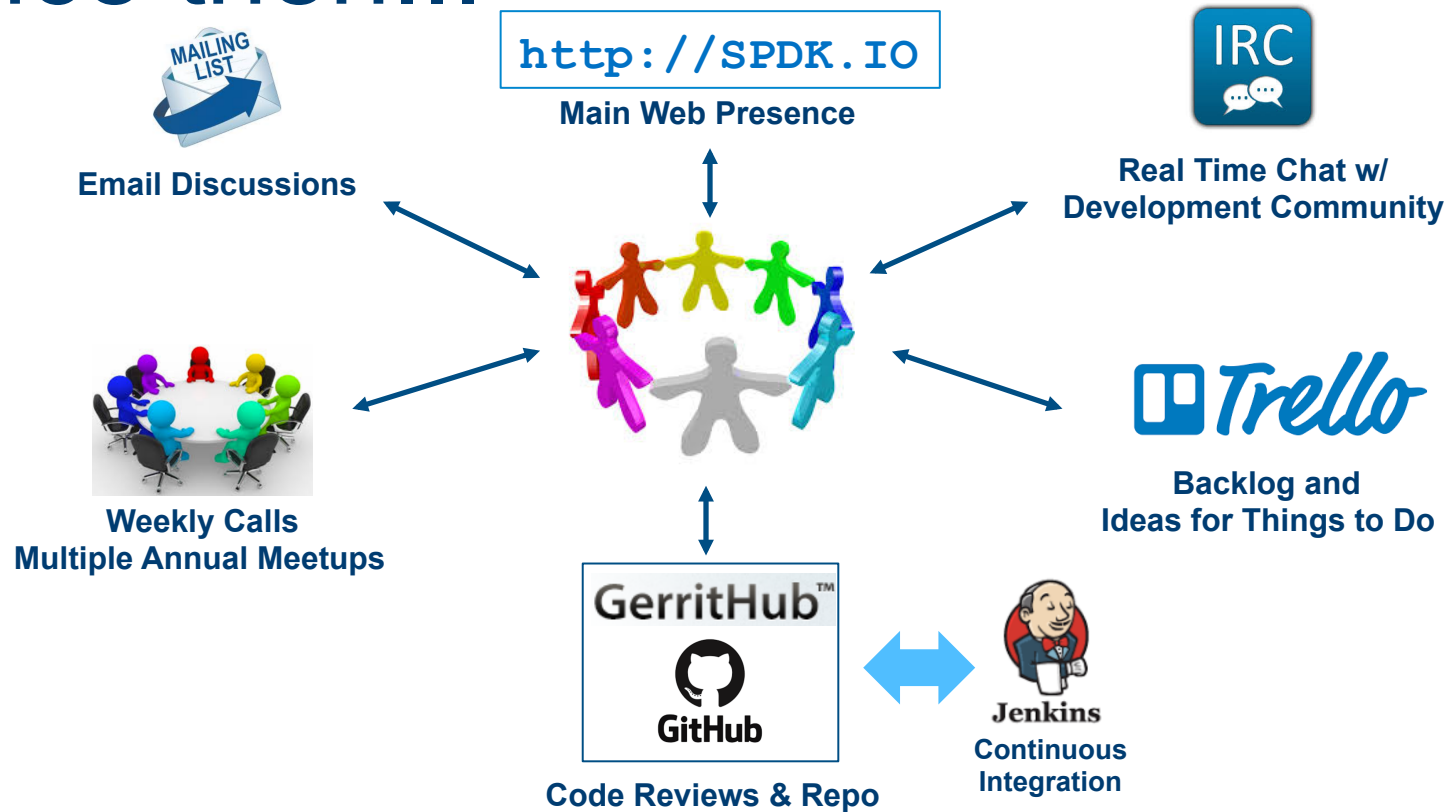
2 yearS ago...

SPDK delivering exciting features and performance, but...

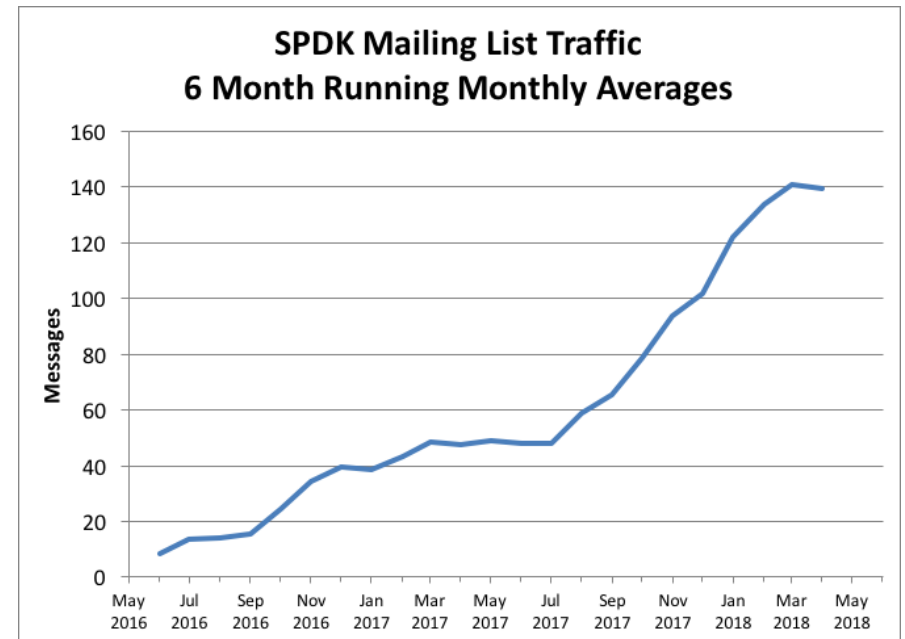
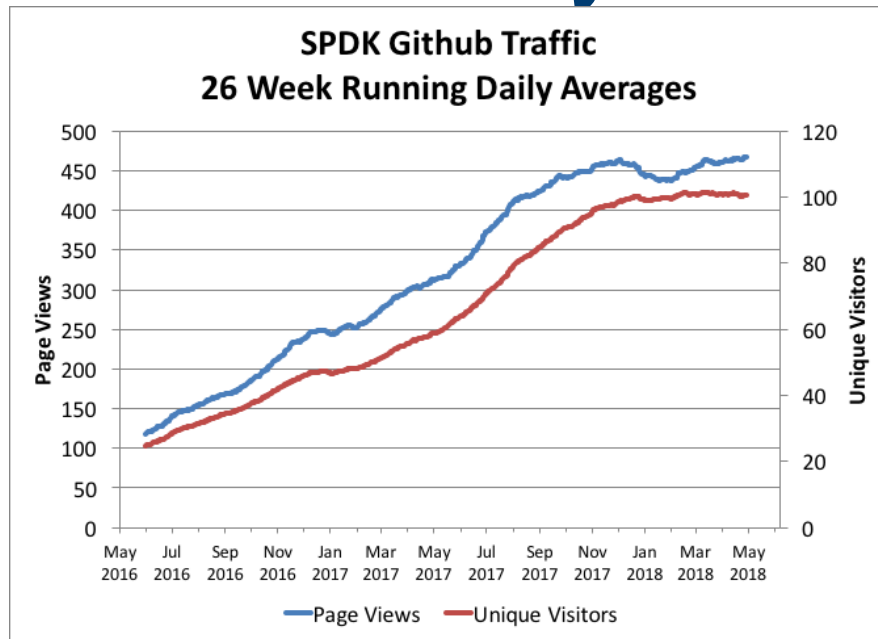
- Was difficult for people outside Intel to contribute
- No transparency on work going on inside Intel
- Internal automated test framework

**SPDK needed to truly become an open source community –
not just an Intel open source code repository!**

Since then...



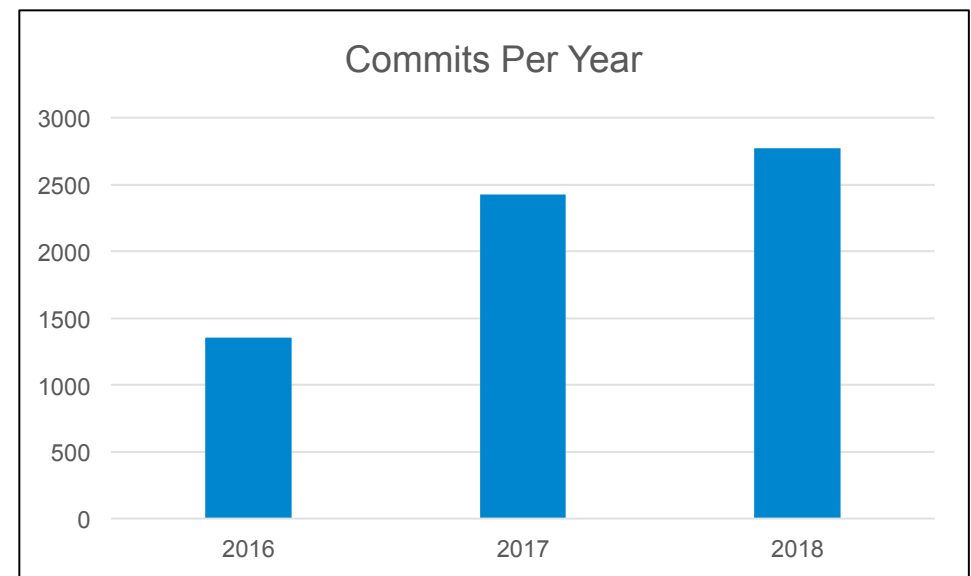
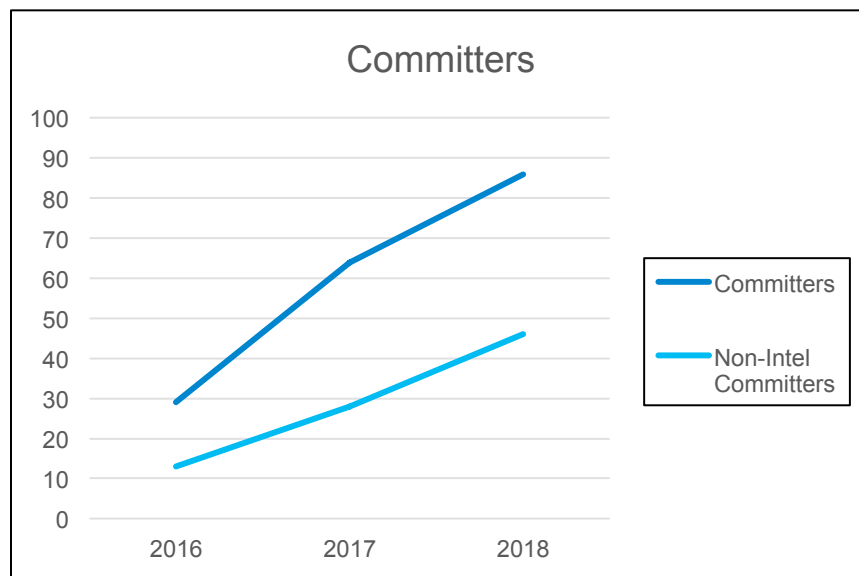
Community Growth



GitHub Traffic +60% Mailing List Traffic +200%

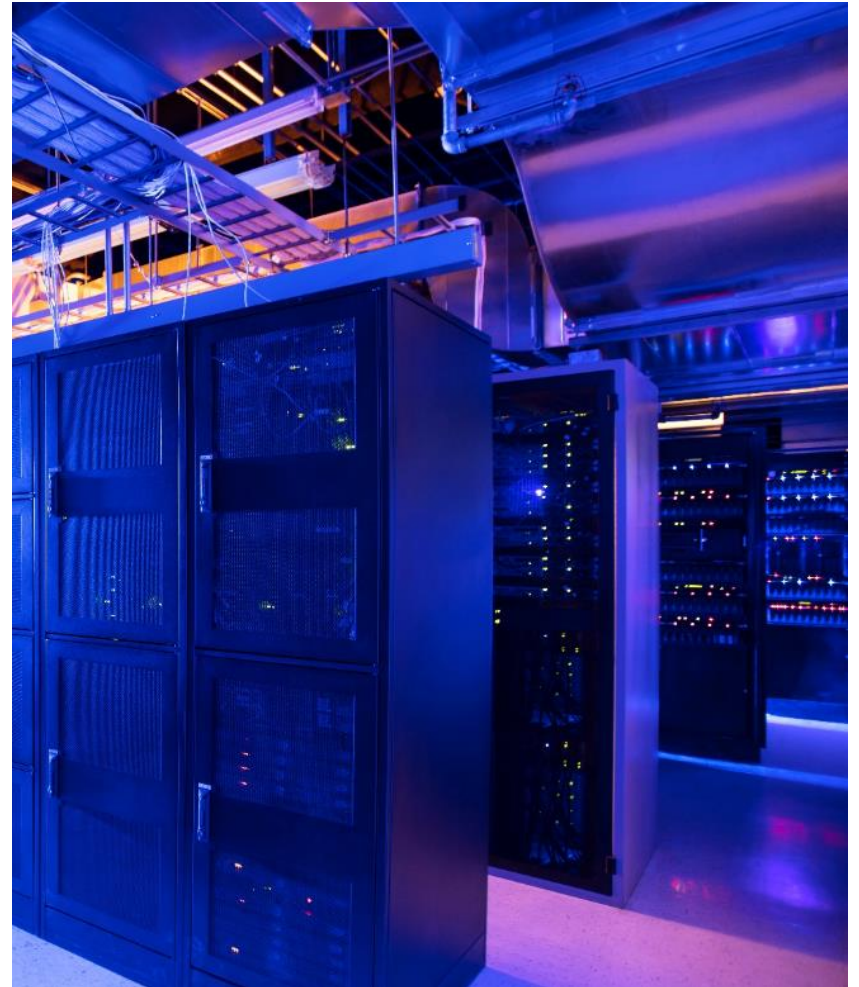
Intel internal data based on publicly available GitHub and mailing list data.

Community Growth

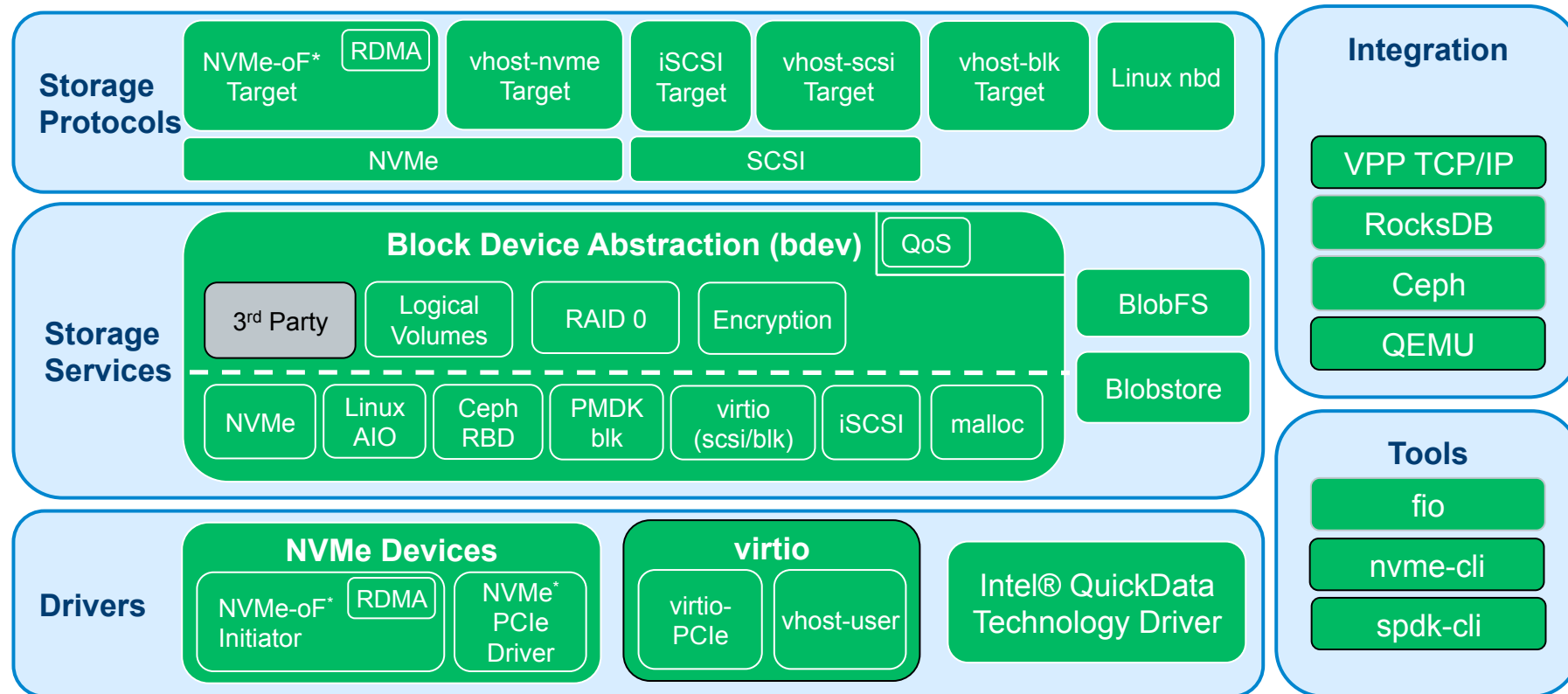


Intel internal data based on publicly available GitHub and mailing list data.

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SPDK Architecture



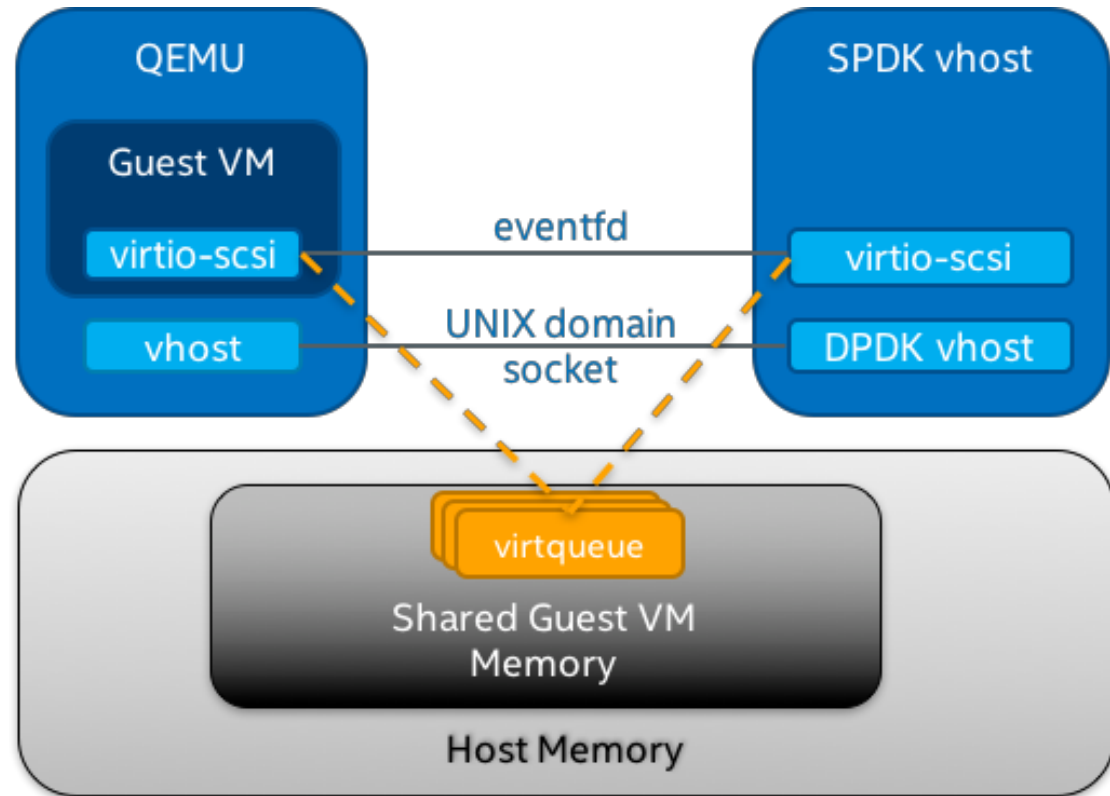
vhost

Provide SPDK-based storage to QEMU-based VMs

- virtio-scsi
- virtio-blk
- nvme (experimental)

and non-QEMU host processes

- containers

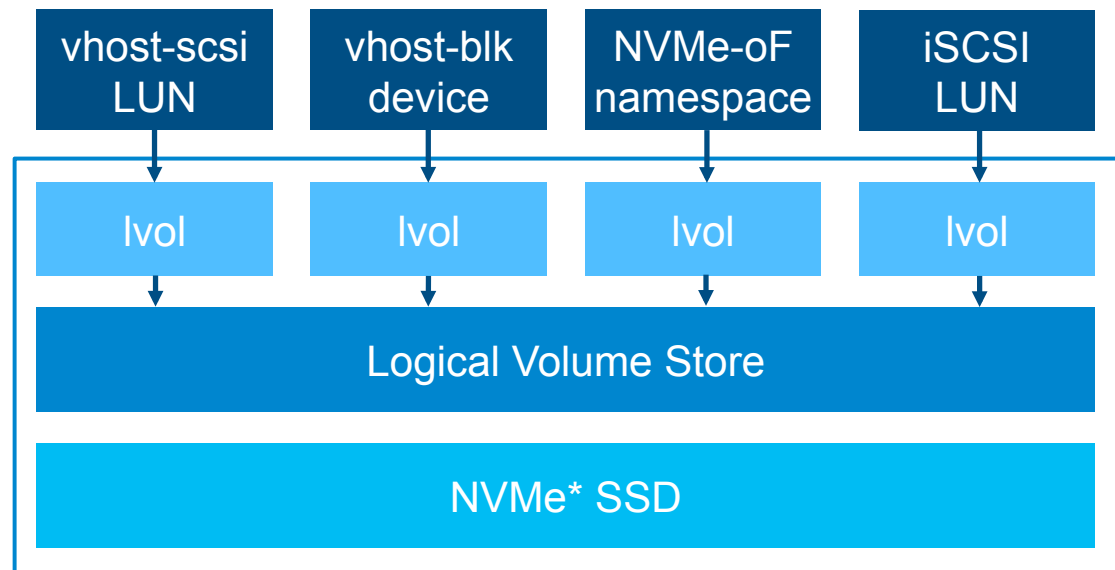


Logical Volumes

Dynamic partitioning

Thin provisioning

Clones and snapshots



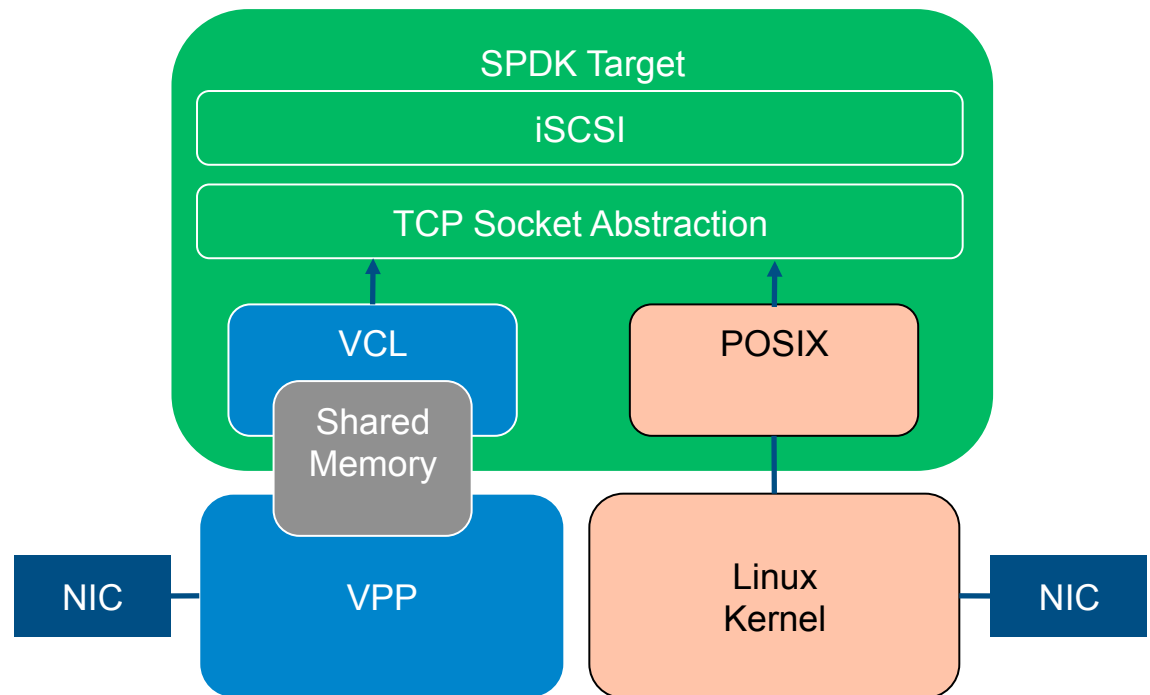
Userspace TCP/IP



FD.io – The Fast Data Project

- VPP – Vector Packet Processing

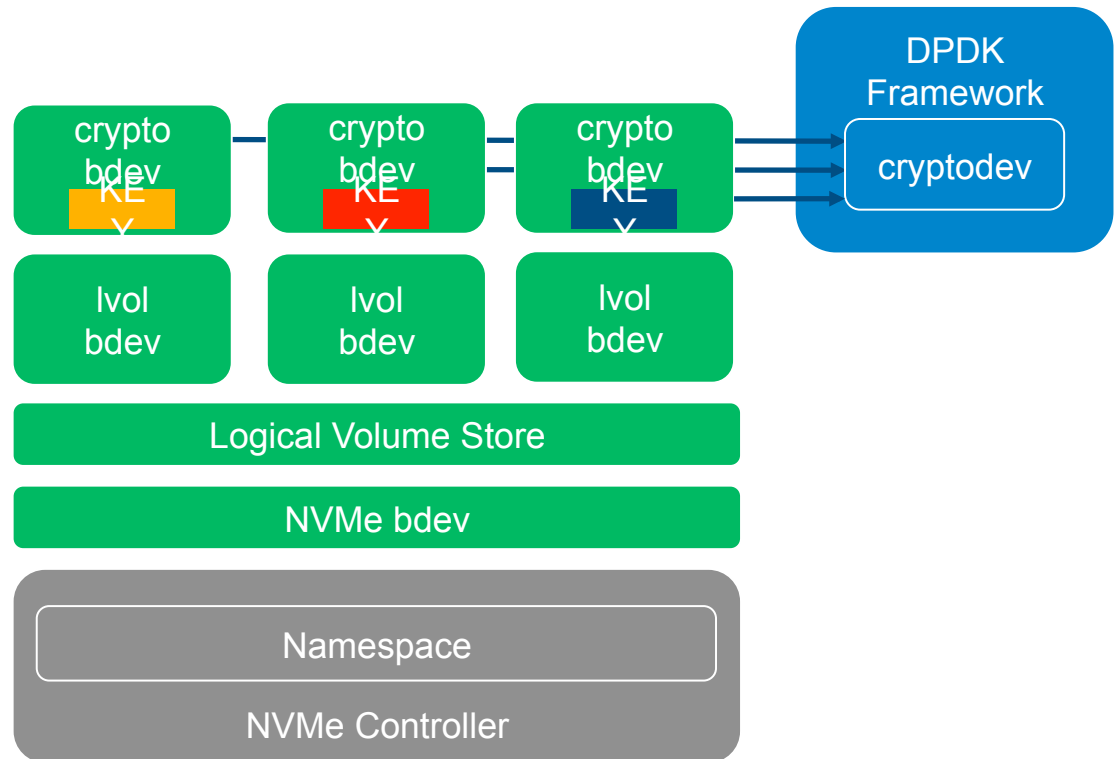
Utilize VCL (VPP Communications Library) for accelerated TCP processing



Accelerators

DPDK Framework

- Hardware Accelerators
- Optimized Software



Configuration

Full JSON-RPC Configuration

spdkcli - Terminal-based user interface

```
% sudo scripts/spdkcli.py                                     (git)-[master]-
SPDK CLI v0.1

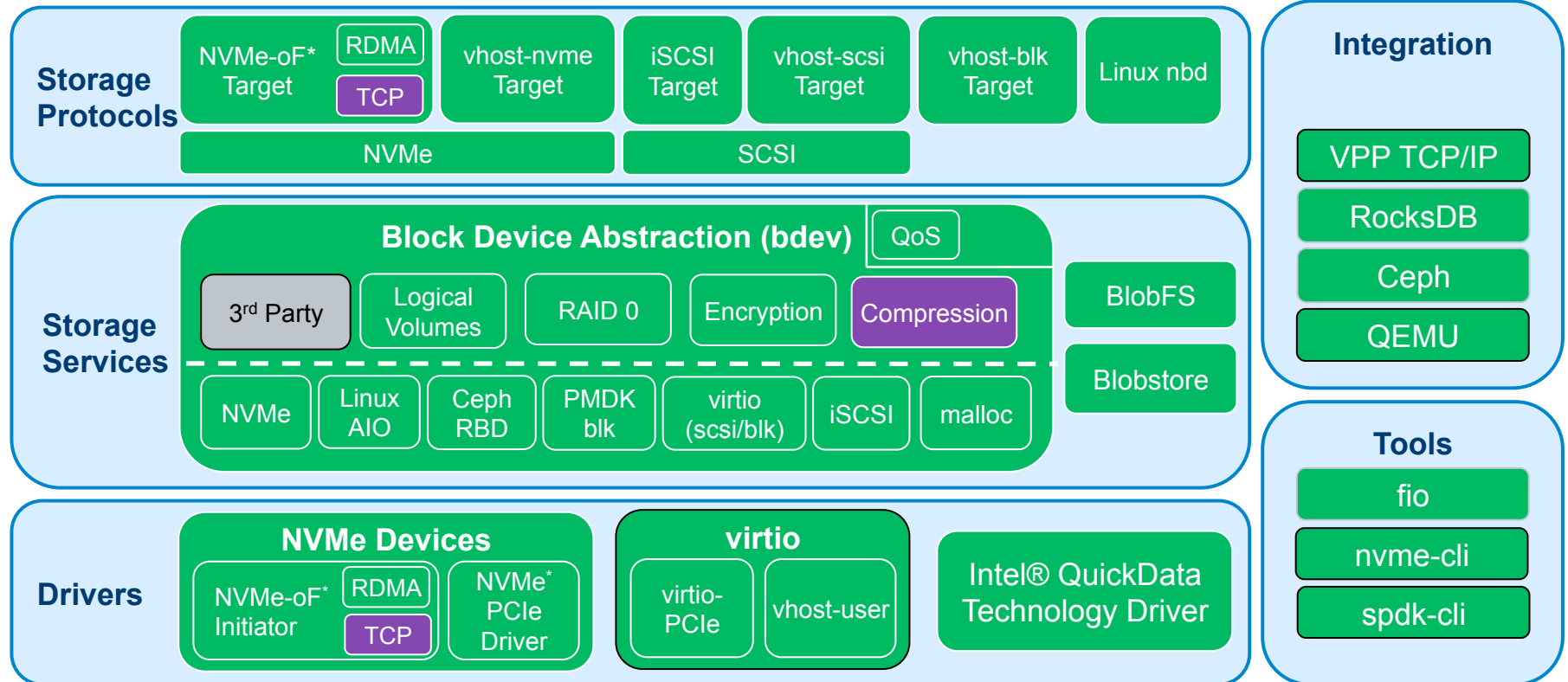
/> ls
o- / ..... [...]
  o- bdevs ..... [Bdevs: 0]
    | o- AIO ..... [Bdevs: 4]
    | o- Logical_Volume ..... [lvs0/lvol0, Size=1.0G, Not claimed]
    | | o- 2f0293da-2106-40c2-8837-57a86a8be9b4 ..... [lvs0/lvol3, Size=40.0G, Not claimed]
    | | o- 47c8d645-3f10-4f08-acfb-0731b7c21aa4 ..... [lvs0/lvol2, Size=20.0G, Not claimed]
    | | o- 89859d4a-d6cc-4bcc-821d-29a52eb1fc75 ..... [lvs0/lvol1, Size=10.0G, Not claimed]
    | | o- a9fe328b-a9f5-42c8-a888-f290a1f3a5e7 ..... [Size=512.0M, Not claimed]
    | o- Malloc ..... [Size=512.0M, Not claimed]
    | o- NVMe ..... [Bdevs: 2]
    | | o- Nvme0n1 ..... [Size=3.6T, Claimed]
  o- lvol_stores ..... [Lvol stores: 1]
    o- lvs0 ..... [Size=3.6T, Free=3.6T]

/>
```

SPDK Architecture

SPDK 18.10

In Progress



Also In Progress...

Open Channel

Zoned Namespaces

Block Device Aggregation

Mirroring/Replication

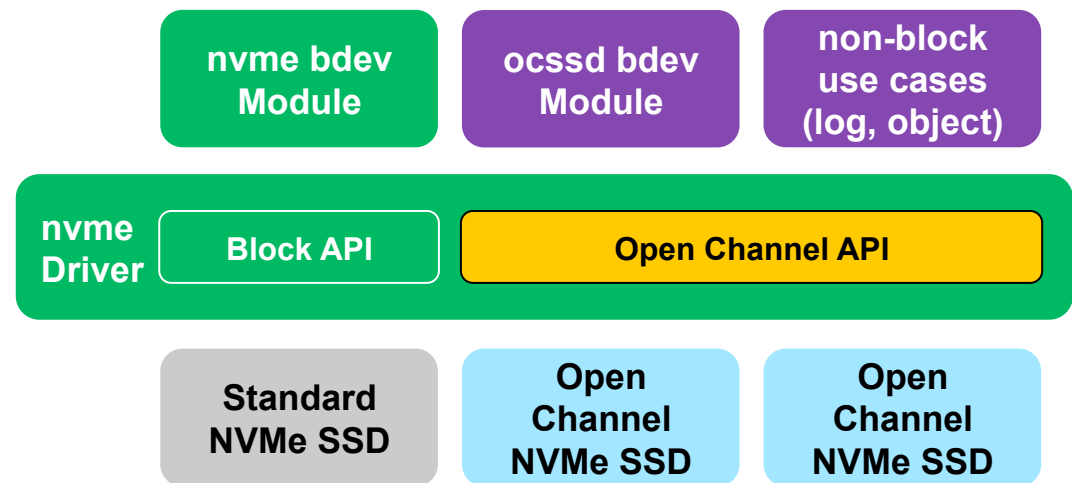
Fibre Channel

Deduplication

open channel

Extend nvme driver API

Ideal environment for Open Channel based applications



Call To Action

Join the community!

