

STORAGE DEVELOPER CONFERENCE



BY Developers FOR Developers

Open Programmable (OPI) Project's DPU/IPU Demos

Presentation Subtitle

Presented by Dan Daly, Intel

OPI – Quick Review

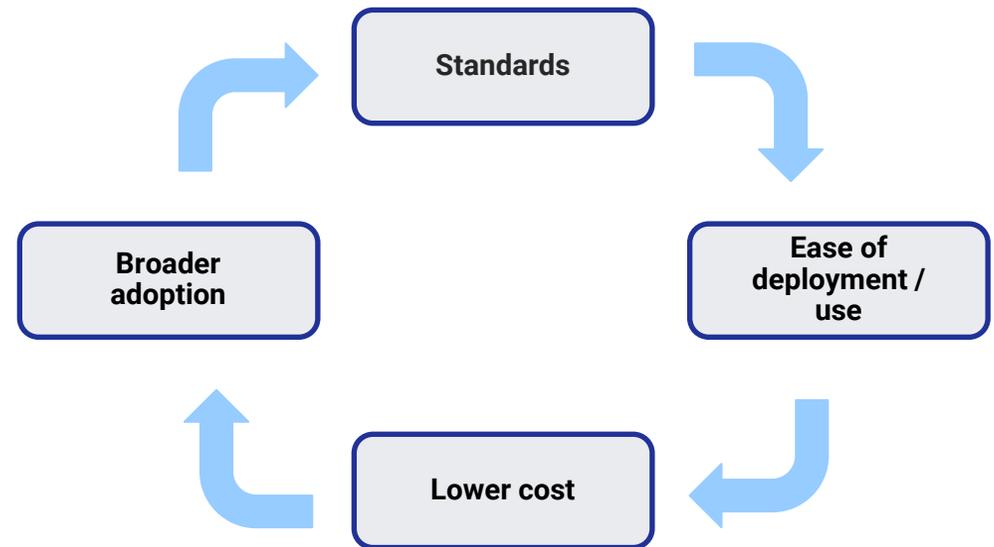
Standardizing DPU/IPU

- Easier to Deploy with OPI Provisioning
- Easier to Run & Maintain with OPI APIs

Well Defined Use Cases

- Use Case Today @ SDC:

Virtual Block Storage



Virtual Block Storage

Initiator – Target Design

Initiator:

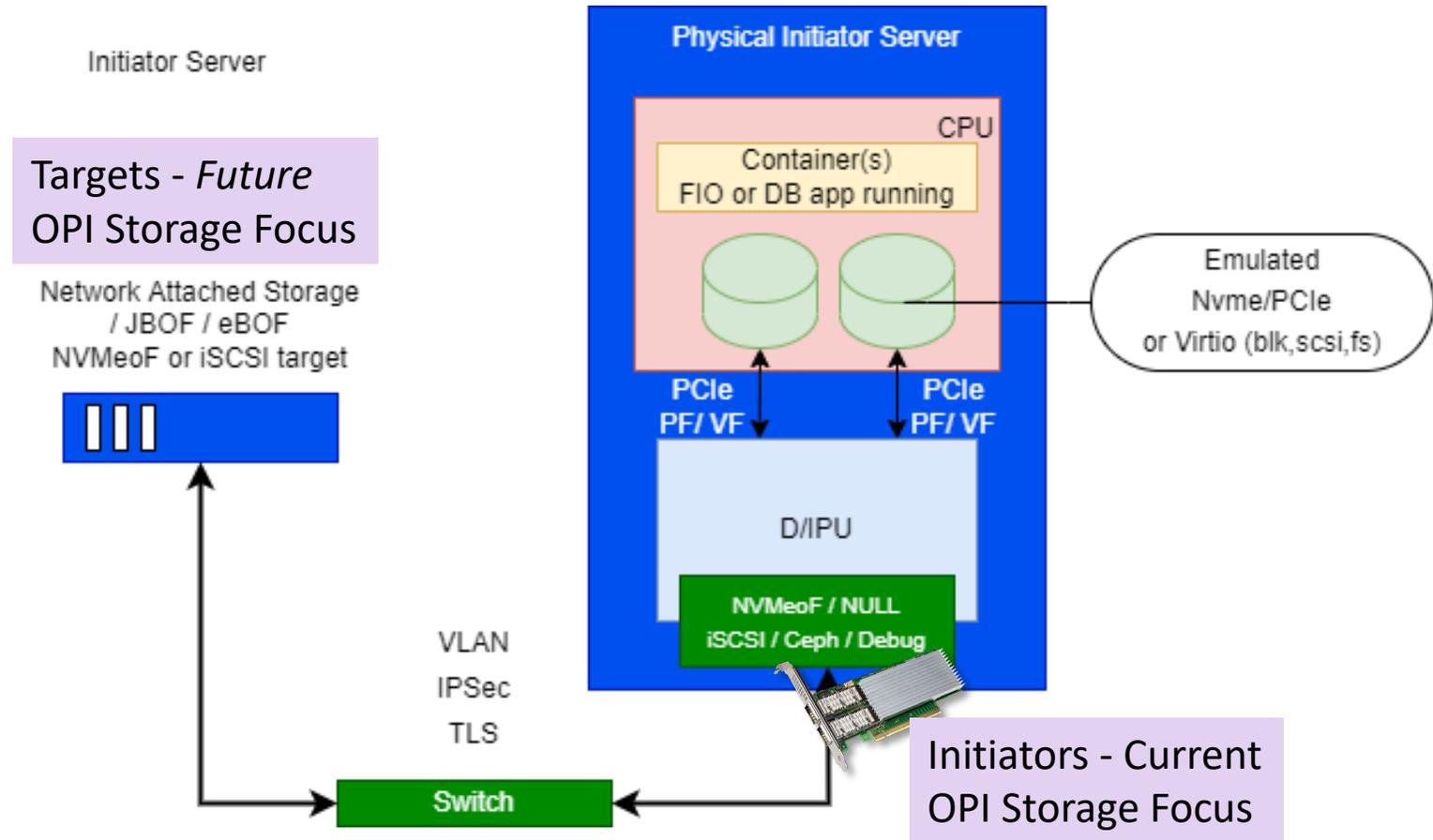
Virtual Device Operations
(Read/Write/Flush/etc.)

Packetized Over Network

Target:

Contains Disks

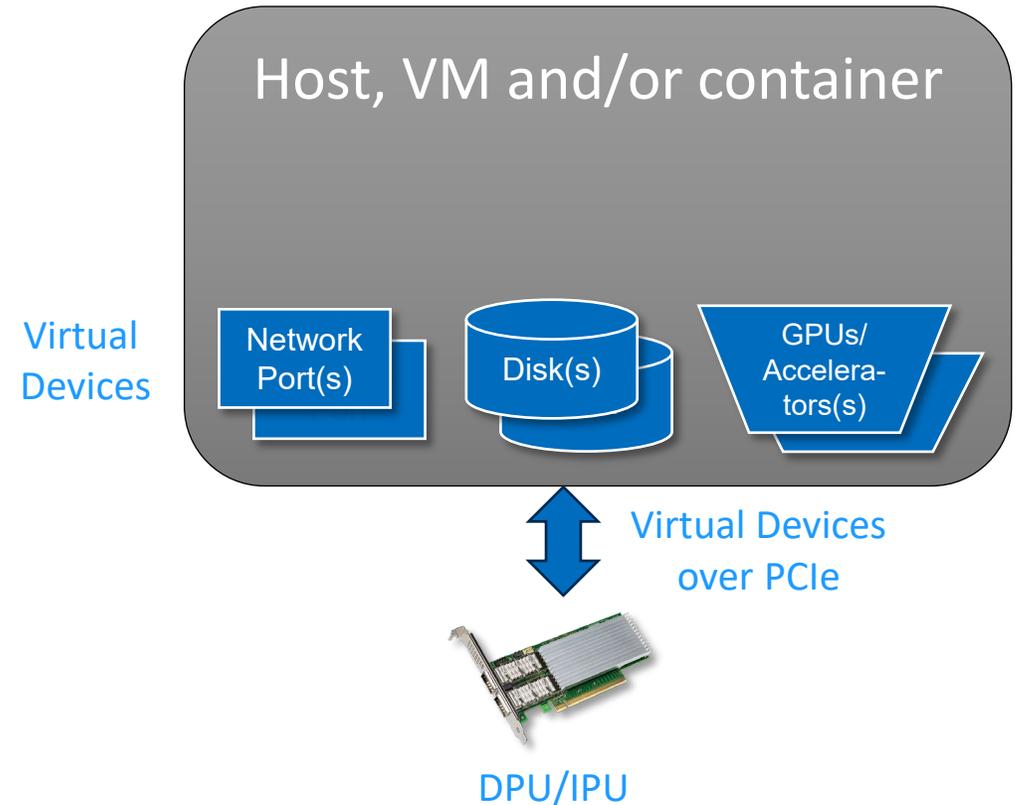
Applies Resiliency



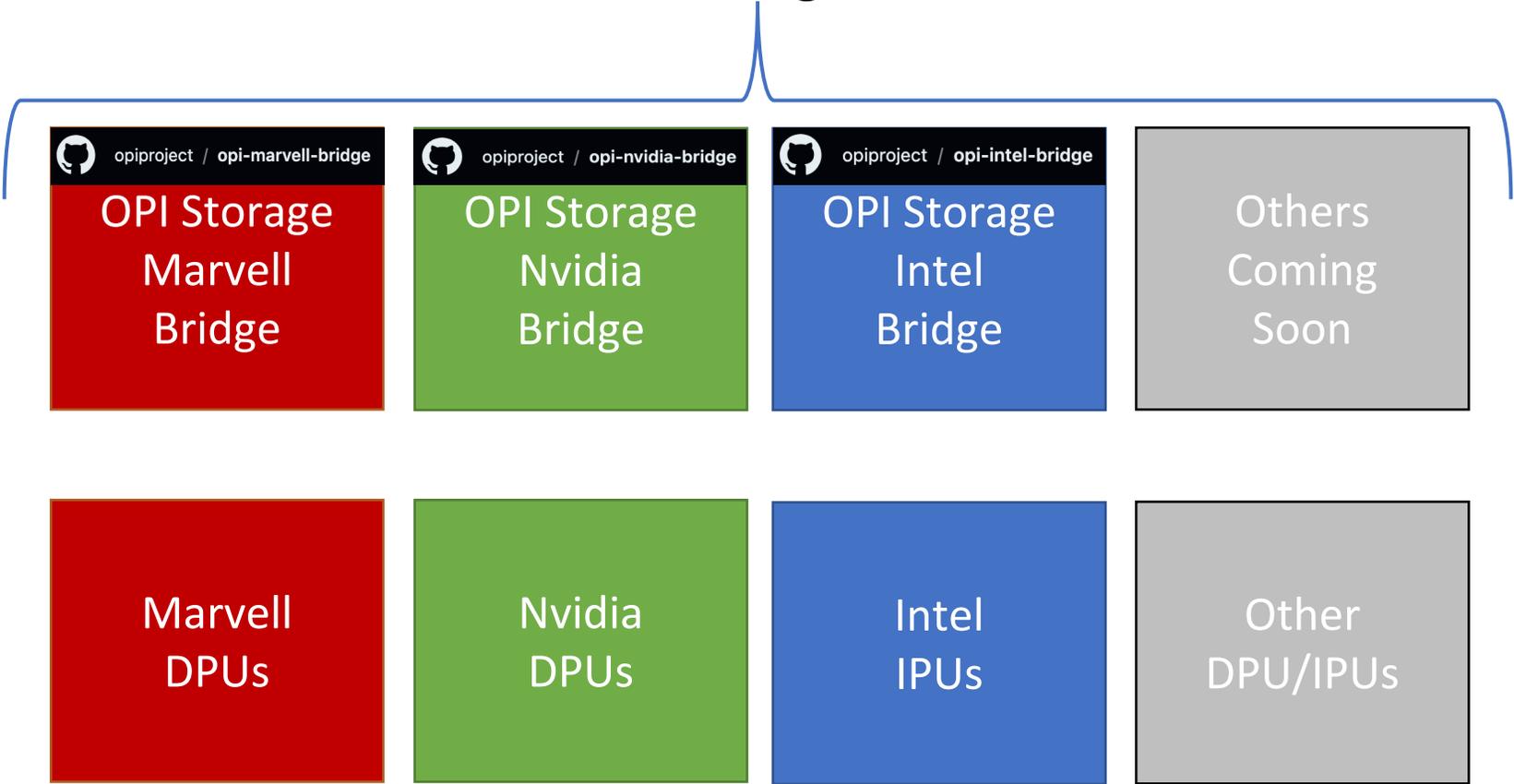
Block Storage Initiator - Overview

Virtual Storage Devices Inside a Server

- No Server Footprint (Drivers Only)
 - Significant Core Savings
 - Simplifies Deployment
- Resilient, Migrate-able, Virtual Disks
 - Disks & Data follows the application
 - Built-in Redundancy & Data Integrity
- No Loss in Performance
 - SSD-level Performance
 - Hardware QoS
- Standard Drivers (NVMe, Virtio-blk/scsi)



OPI APIs Standardization



Let's Try It!



opiproject / opi-marvell-bridge



OPI Storage APIs

Front End – Host Facing APIs

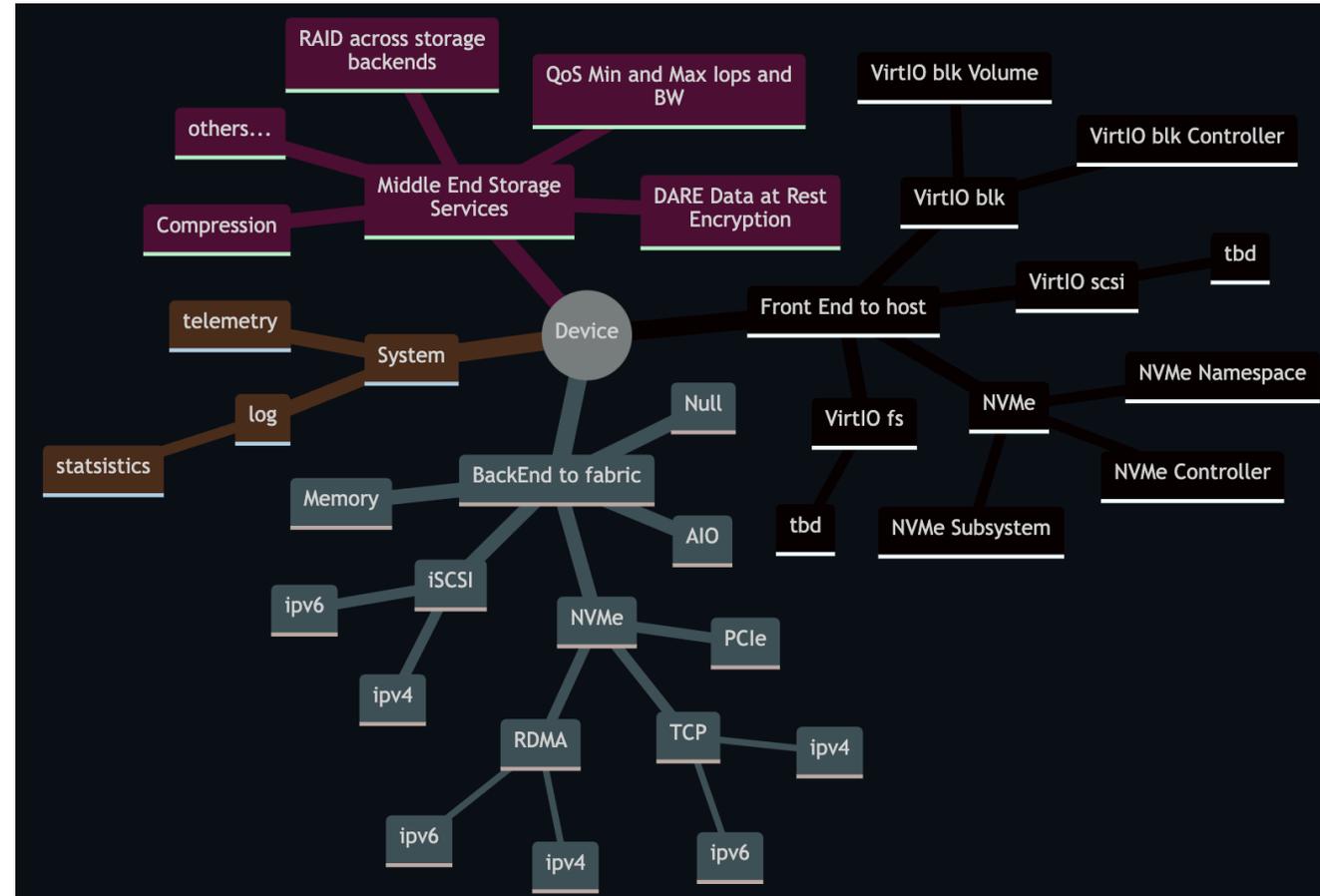
NVMe, Virtio-blk/scsi create, delete, limit, ...
Properties of controllers & disks
Future: Object & Filesystem Front End

Middle End – Storage Services APIs

Encryption, QoS, Compression, Resiliency, ...
Logical Services for Virtual Devices

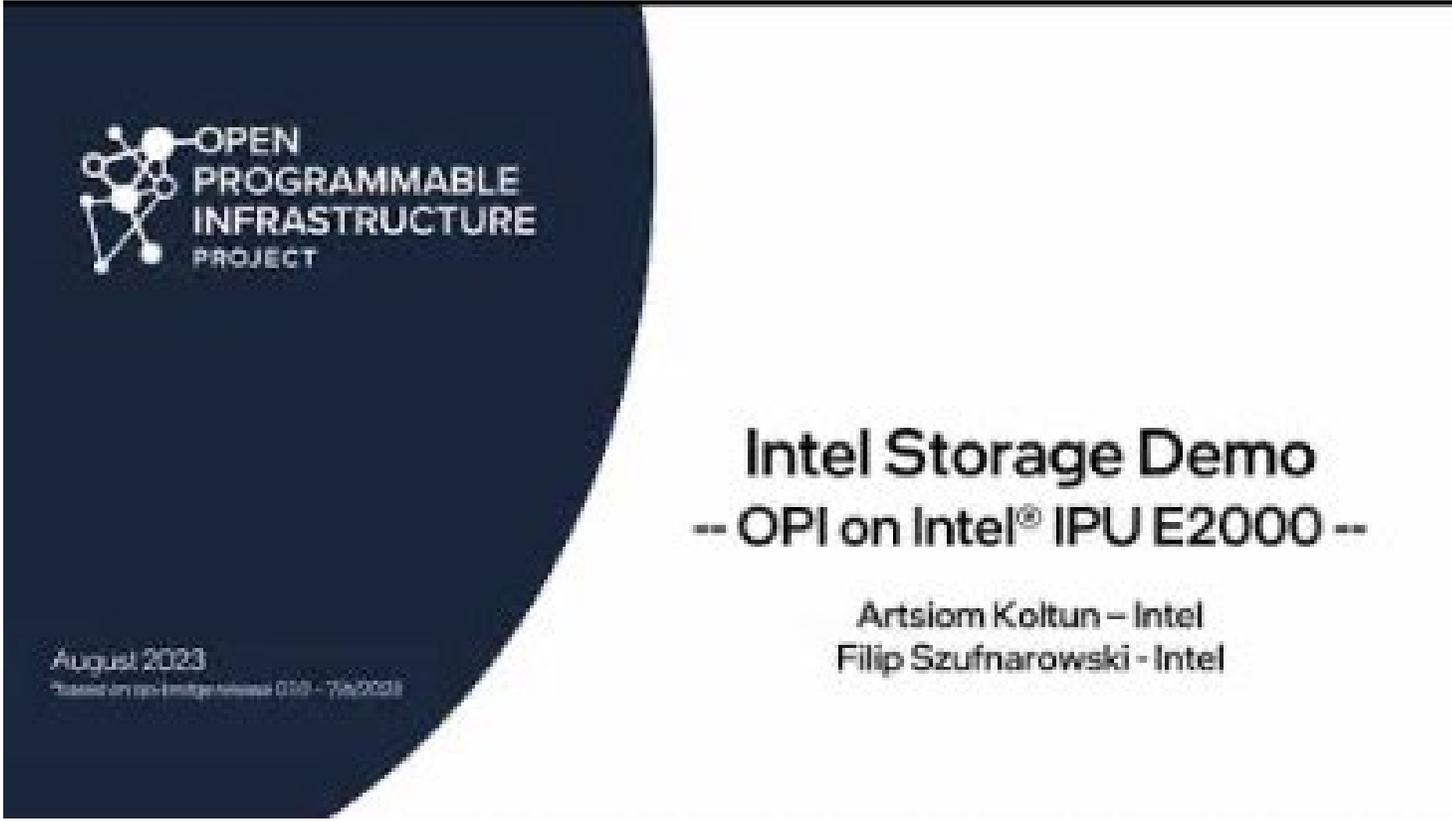
Back End – Network Facing APIs

Local Disks & Remote Targets
Transports (PCI, TCP, RDMA, ...)
Protocols (NVMe-o-TCP/TLS/Fabric, iSCSI, ...)



OPI Storage APIs Demo

1. Device Creation
2. Remote Target Connect w/ Multipath
3. Device Level QoS Hardware Rate Limit
4. Hardware Disk Encryption



The slide features a dark blue background on the left side with a white logo for the 'OPEN PROGRAMMABLE INFRASTRUCTURE PROJECT' and the date 'August 2023'. The right side is white and contains the title 'Intel Storage Demo -- OPI on Intel® IPU E2000 --' and the names of the presenters: 'Artsiom Koltun - Intel' and 'Filip Szufnarowski - Intel'.

Coming Soon - OPI Lab

Access to DPU/IPUs donated by vendors

Provisioned and Programmed Using OPI Standards

Set up more complex use cases

e.g.,

DPU/IPU Infrastructure for AI Clusters

DPU/IPUs Enabling Cloud Native Wireless Core

Virtualized, Secure, High-Speed Networking & Storage

Summary

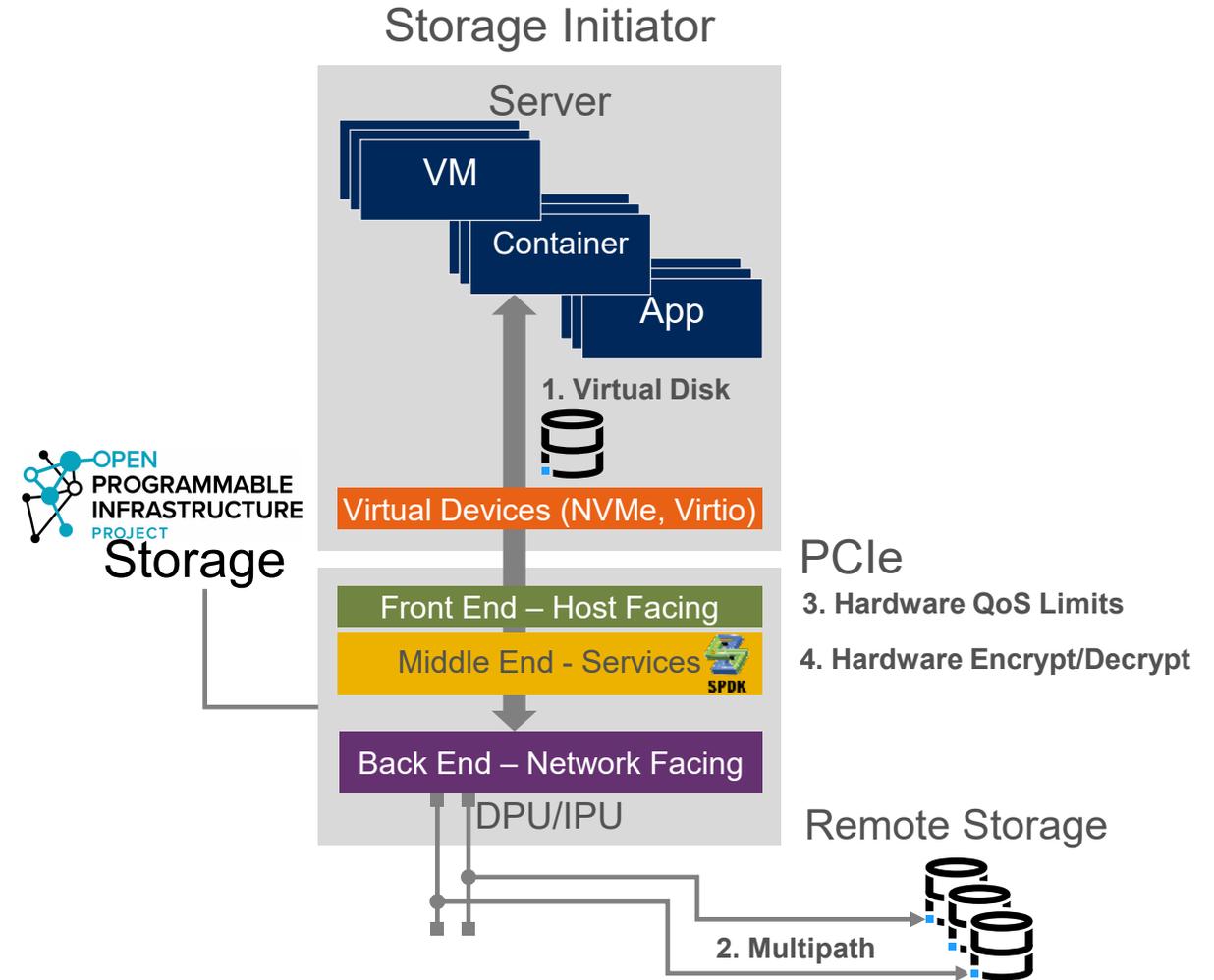
OPI Storage APIs running on
Multiple DPU/IPU-based Systems

1. Block Device Management
2. Multipath Network Connectivity
3. Hardware QoS Limits
4. Hardware Crypto

More features exposed over time

OPI Lab to Build & Test Systems

Join Us! github.com/opiproject 





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