Getting to One

The case for NVMe as the unifying interface for storage devices

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Why is PCIe-NVMe Synonymous with SSD?

1. Massive Parallelism
   - Many IO queues, direct connect to the memory complex.
   - A rich, but lightweight protocol.
   - Flexible capacity management.

2. Protocol
   - Rich, but lightweight.
   - Abstracts device complexity.
   - Security innovation.

3. Capacity Management
   - Name spaces & associated benefits to space allocation and performance segregation.

Why?
Because it was designed for SSD.
Four Pieces of the Puzzle to Bring HDD into the Family

**PCI connectivity**
- PCI Switch architectures for dense JBOD applications

**Command “Standard”**
- NVMe has the needed commands for HDD
- Some optimization would be nice

**Direct Connect**
- Copper connection to storage servers
- Now available in some HBA configurations

**Indirect Connection**
- Fabric solutions for disaggregation and virtualization
- “Composability”
Getting to one Interface: “Friends with Benefits”

- Optimized Silicon
- Streamlined Software & Firmware
- Simple Device Management
- Low Cost PCIe Switching
- Singular Interface Protocol

Source: Trend Focus
Next Steps

OCP Working Group?

- NVMe HDD command review
- Connector standard for HDD & Contribution to OCP
- Evaluation of other enabling developments (PCIe switches and design, HBAs, Smart NICs, etc…).
Questions