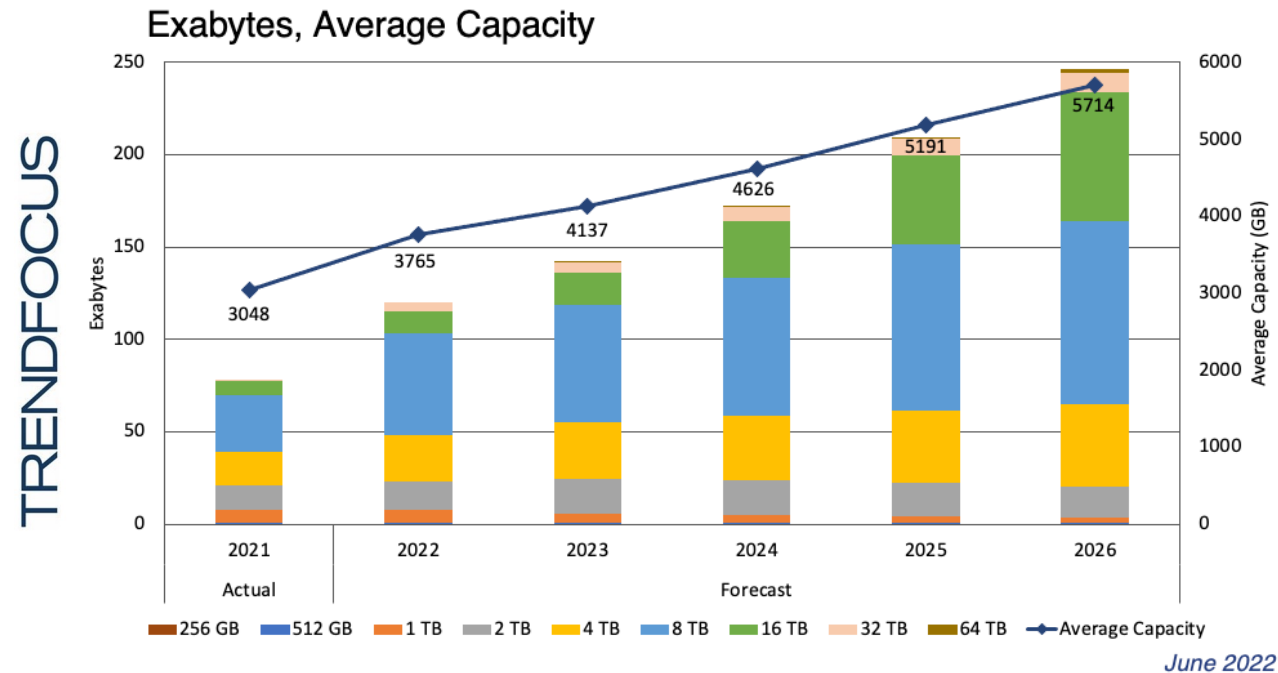


Solving Datacenter Boot SSD Challenges

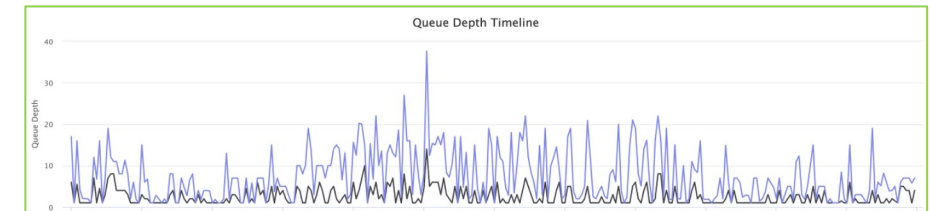
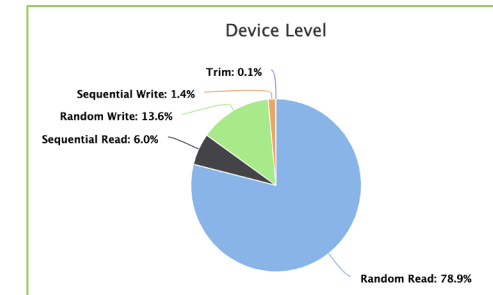
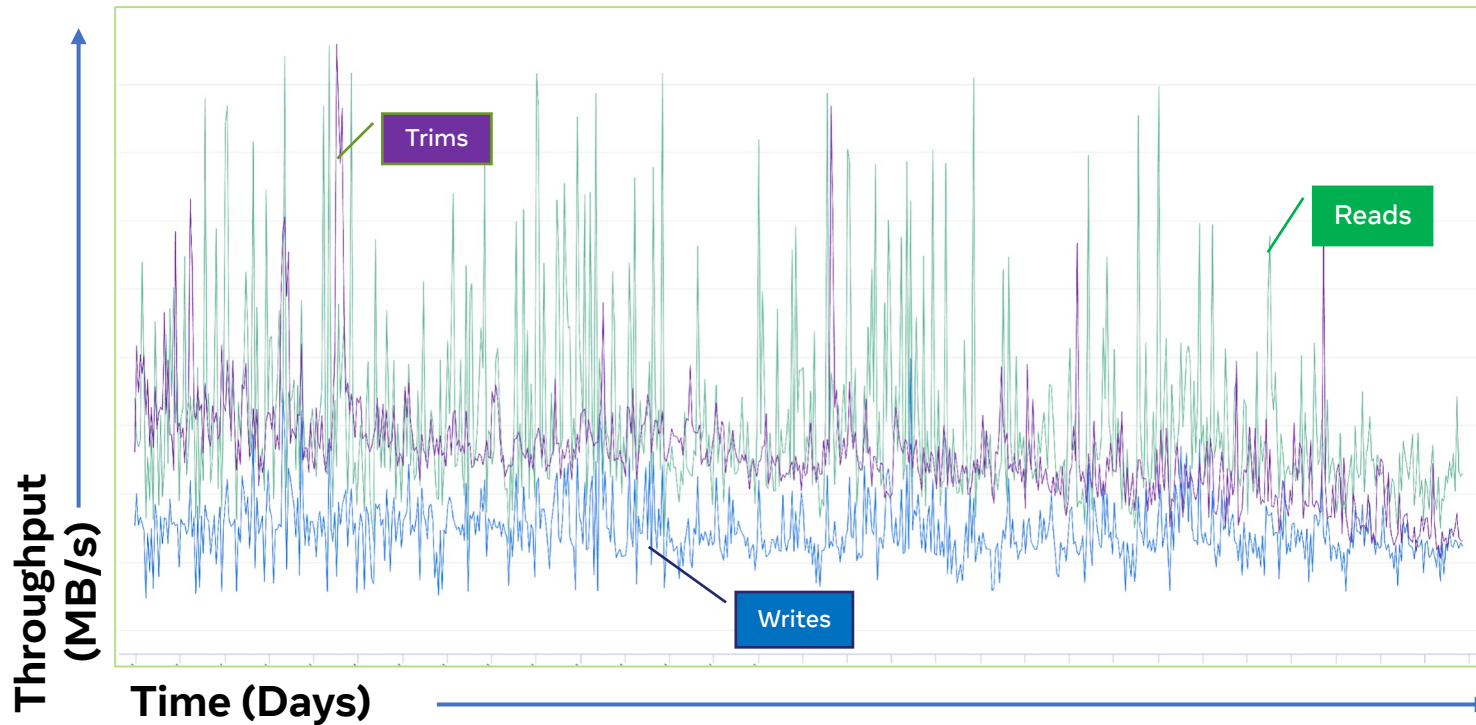
Karthik Shivaram, Storage Engineer, META

Datacenter Flash Capacity Trends



- Data Drive capacity keeps increasing
- Boot Drive capacity is increasing at a slower pace
- Increasing capacity = Increasing expense

Hyperscale Boot I/O Profile Example



- Boot Drive experiences constant traffic with no idle time
- Majority of traffic is random in nature with low Queue Depth
- TRIM rate on Boot Drive is very high
 - Latency stalls due to TRIM is not desirable

Boot Drive Performance @Scale

- Performance tests for Hyperscale Boot Drives is not clear
- No public performance specification

Result:

- Leads to huge drive-to-drive performance variation
- Hyperscalers struggle to deploy with huge performance variation

Hyperscale Endurance, Monitoring & Security Requirements

- Monitoring helps predict & detect failing drives at-scale
- Boot SSDs need higher endurance to prevent early wear out
- Hyperscale customers care and value Security and Privacy
 - Many optional features in Security Standards

- **Hyperscale Boot SSDs require:**
 - High Endurance
 - Enhanced Monitoring
 - Higher level of Security



**How to solve this
problem?**

*Meta & Google
have collaborated to combine
requirements to create the
Hyperscale NVMe™ Boot
SSD Specification v1.0*

Benefits of Public Boot Drive Spec

- Enables:
 - Market to understand features Hyperscalers use
 - Industry alignment on SSD boot drive adoption
 - Use of open-source tools to manage boot SSDs
 - Creation of 3rd party test-suites

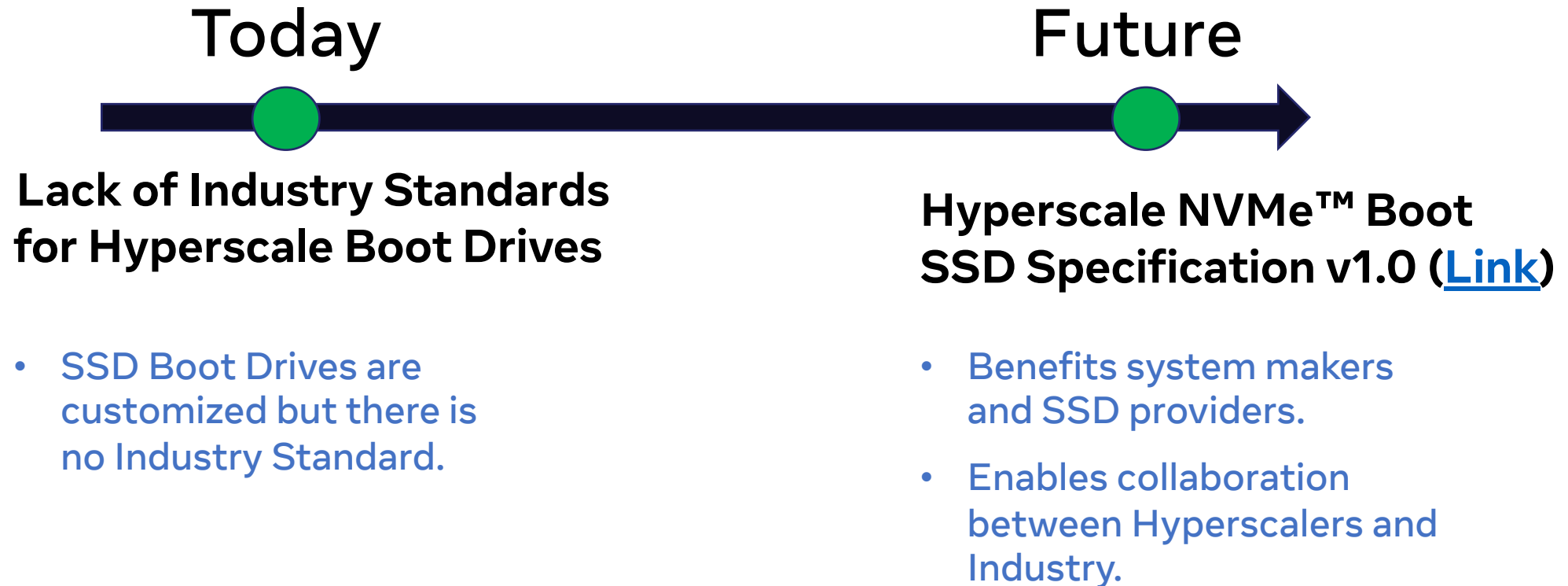
Public requirements increase industry collaboration!

OCP Hyperscale NVMe™ Boot SSD Focus Areas

- This includes requirements around:
 - NVM Express®
 - PCI Express®
 - Endurance
 - SMART Logs
 - Reliability
 - Power
 - Performance
 - Security
 - Side-Band/SM-Bus
 - Sustainability
 - Thermal
 - Monitoring
 - Form-Factor

Everything needed to build a Hyperscale Boot SSD!

Solution





Thank you!