

Computational Storage:

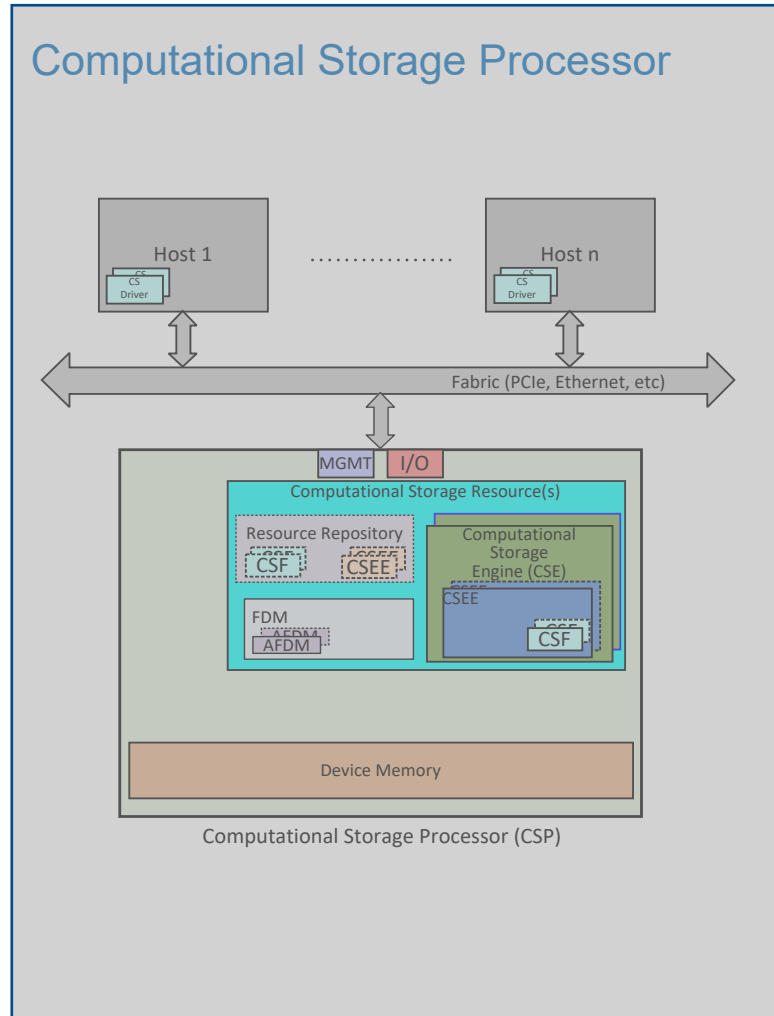
How do NVMe and SNIA CS Work Together

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SNIA TC Co-Chair
NVMe Computational Programs Co-Chair
SSD IO Standards Samsung Semiconductor Inc.

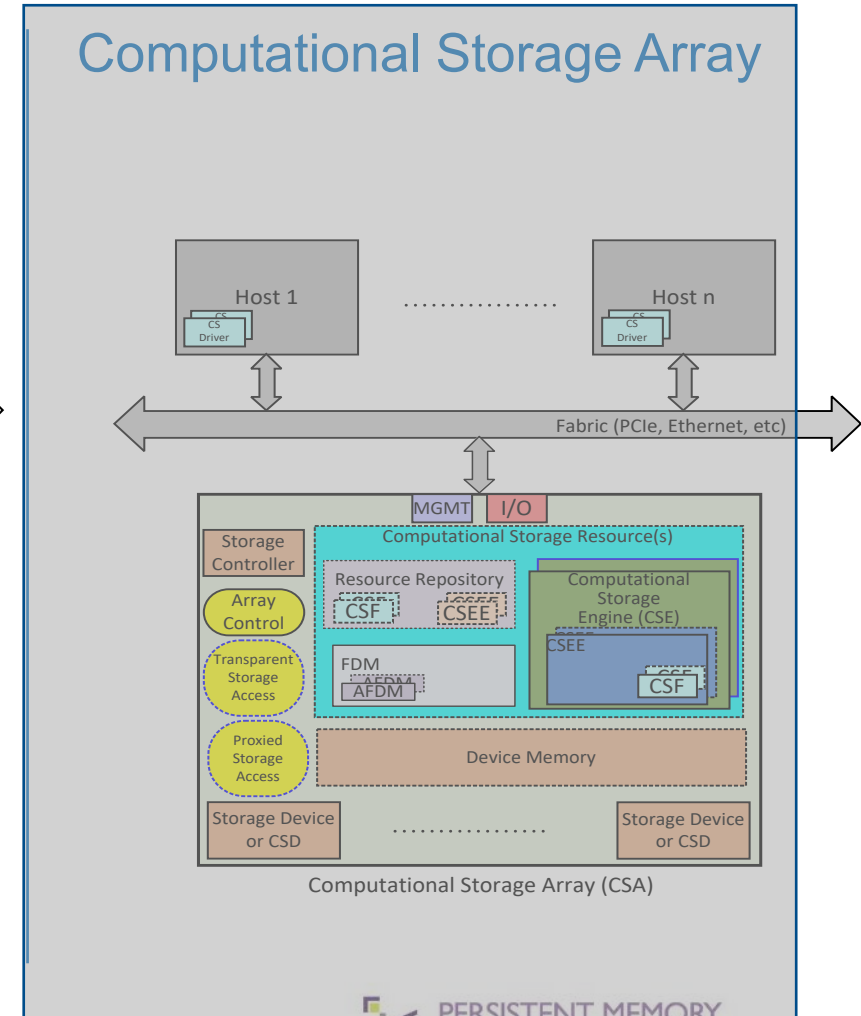
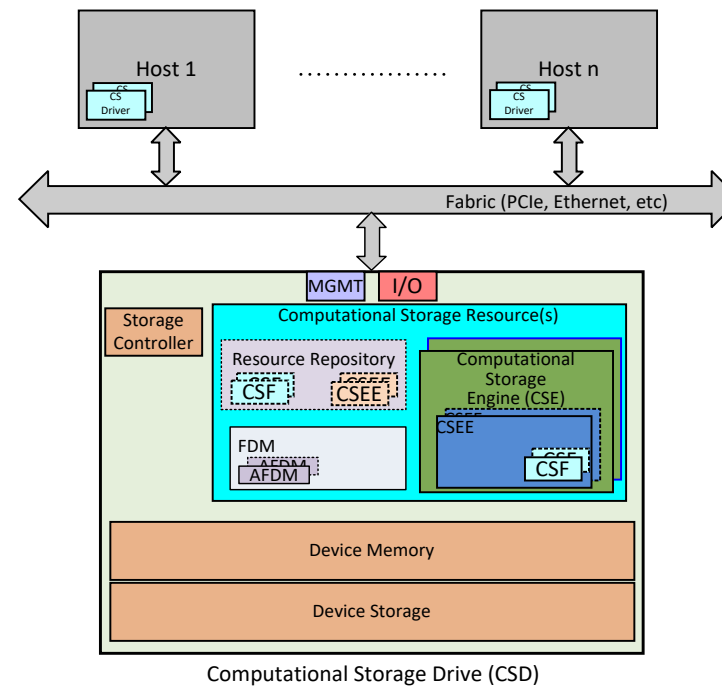
Agenda

- Overview of SNIA CS Model
- Overview of NVMe CP Model
- NVMe-SNIA mapping
- Summary

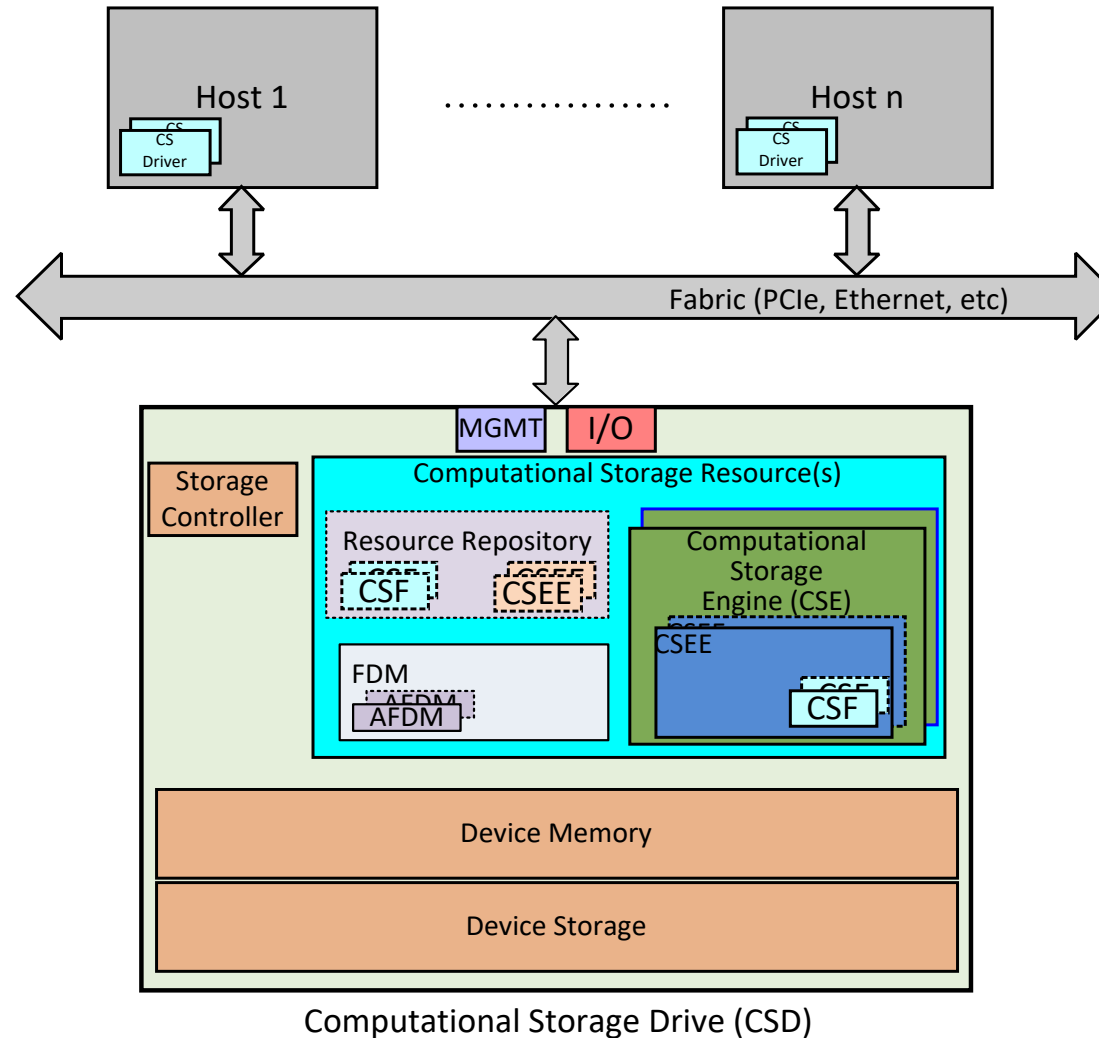
SNIA Computational Storage Architecture



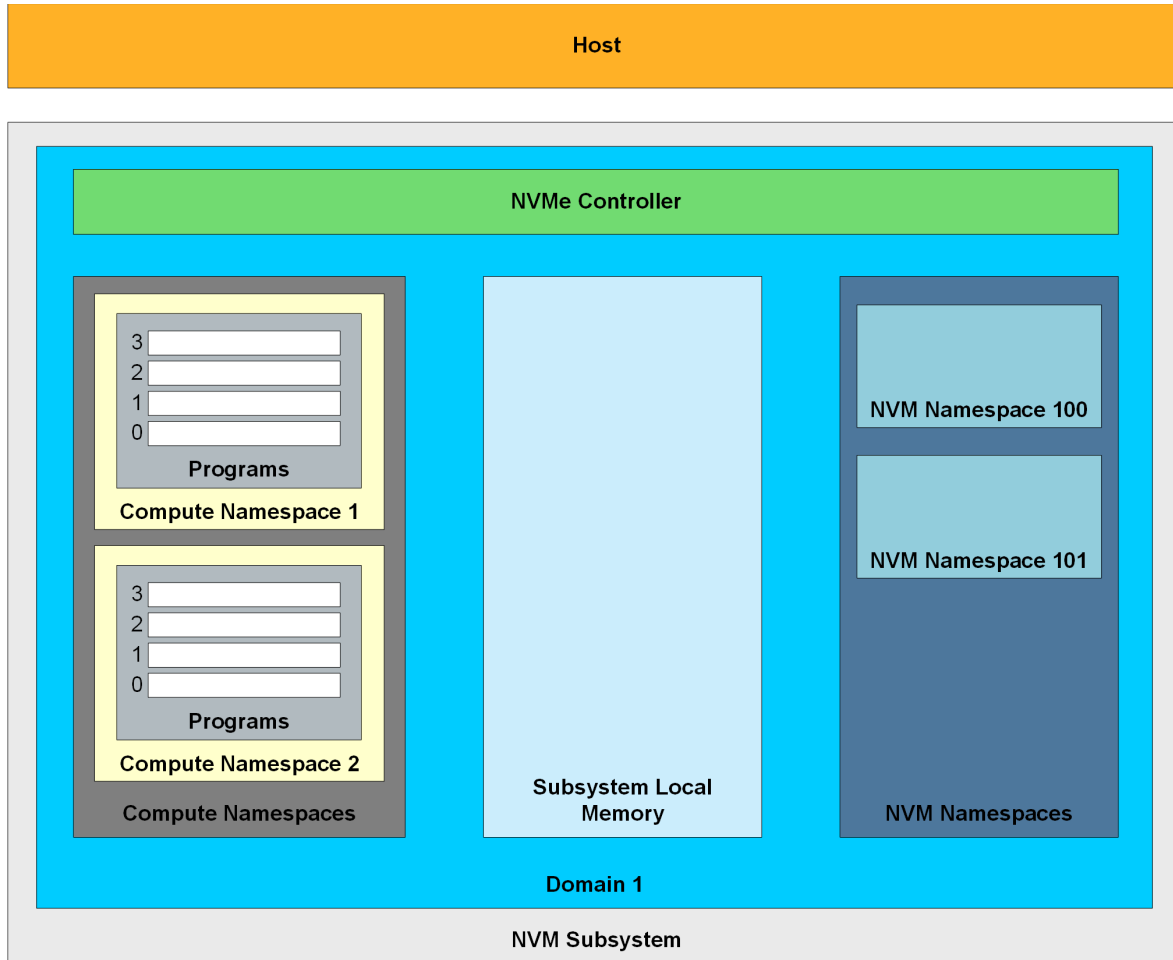
Computational Storage Drive



SNIA Architectural Elements for CS Drive



NVMe Computational Storage Architectural Components



- Compute Namespaces contain:
 - Compute Engines
 - Programs
- Programs operate on data in Subsystem Local Memory
 - Includes program input, output
- NVM Namespaces
 - Persistent storage of data
 - NVM
 - ZNS
 - KV

This presentation discusses NVMe work in progress, which is subject to change without notice.

Correlation of SNIA/NVMe terms

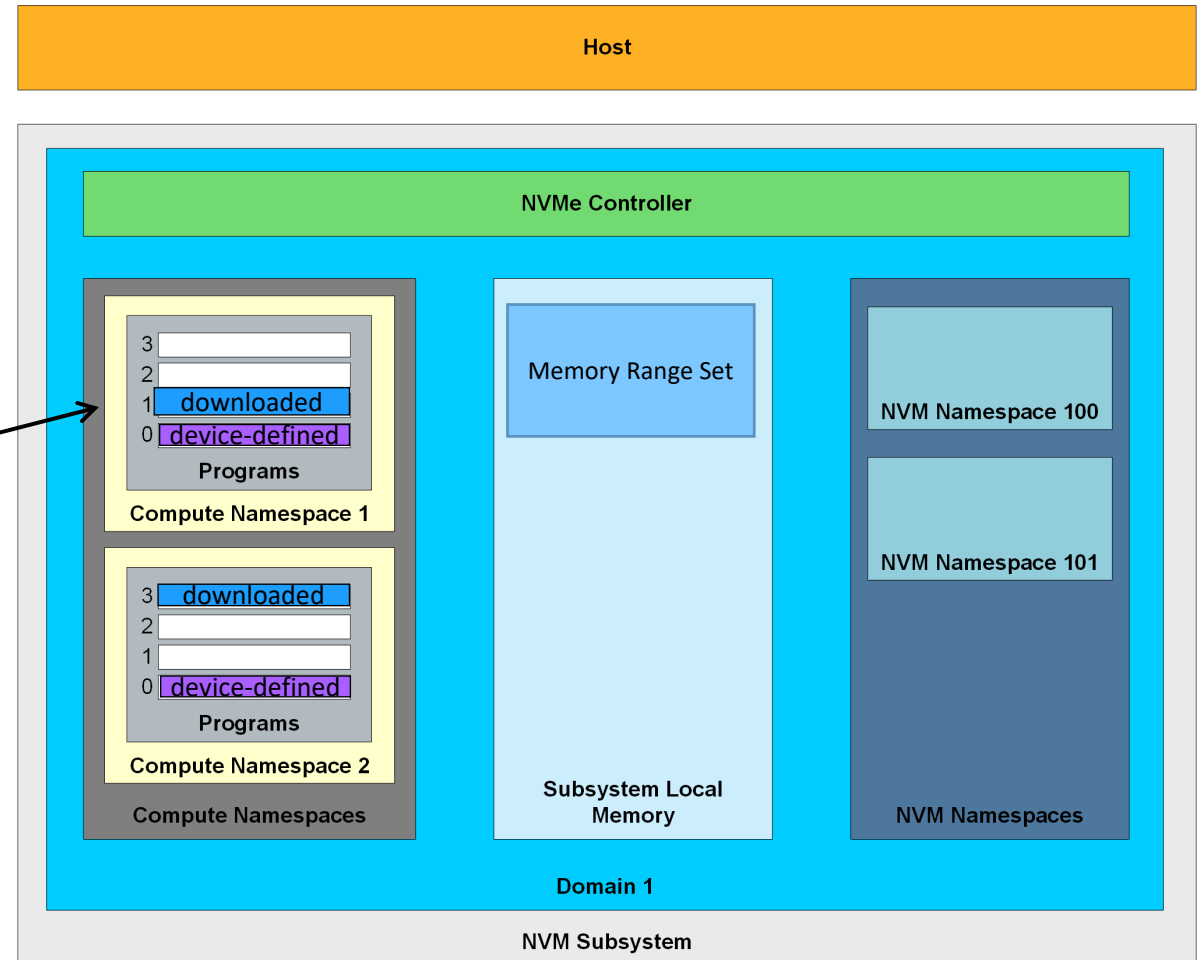
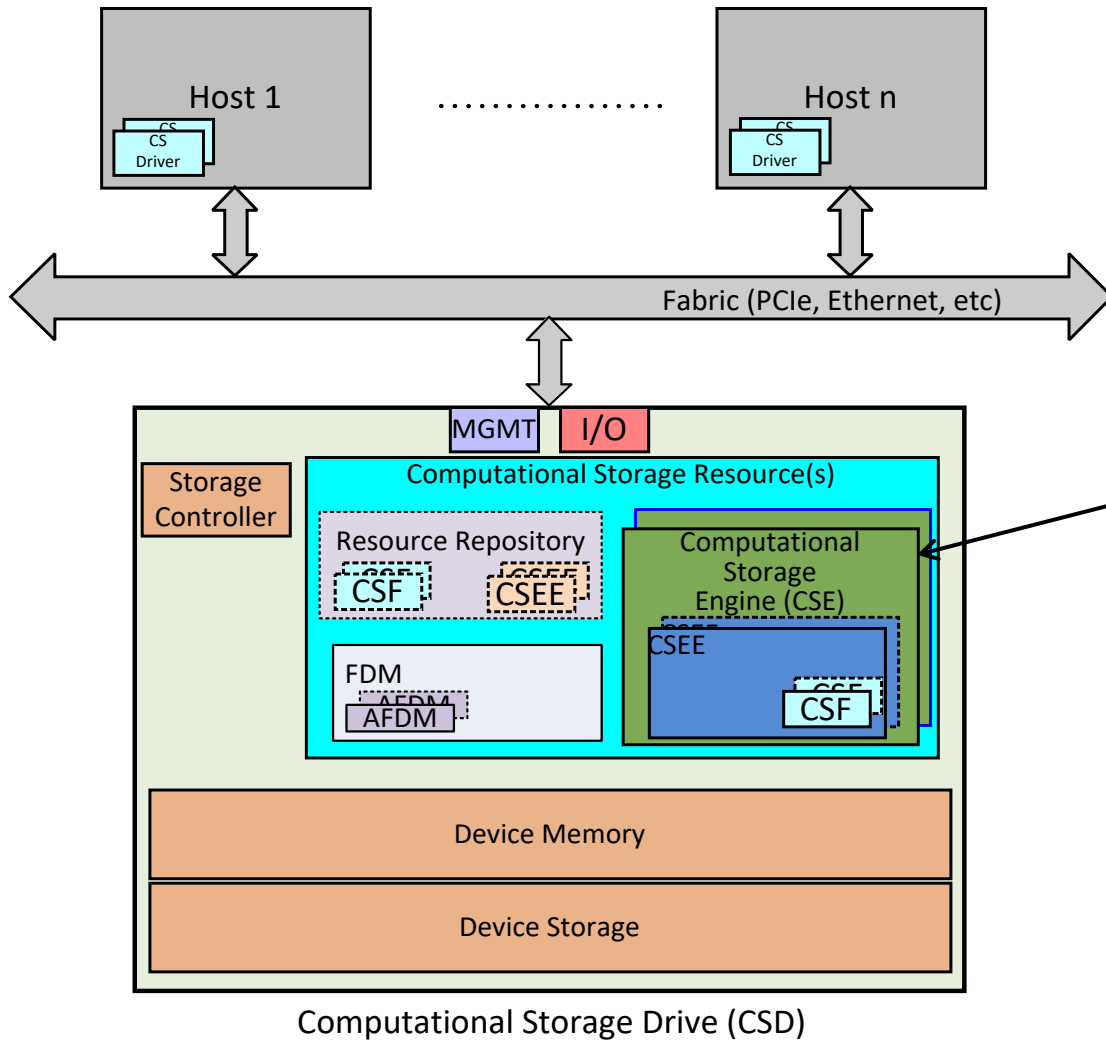
SNIA Terms

- Computational Storage Engine
- Computational Storage Engine Environment
- Resource Repository
 - Downloaded CSF
 - Pre-loaded CSF
- Function Data Memory (FDM)
- Allocated FDM (AFDM)
- Device Storage

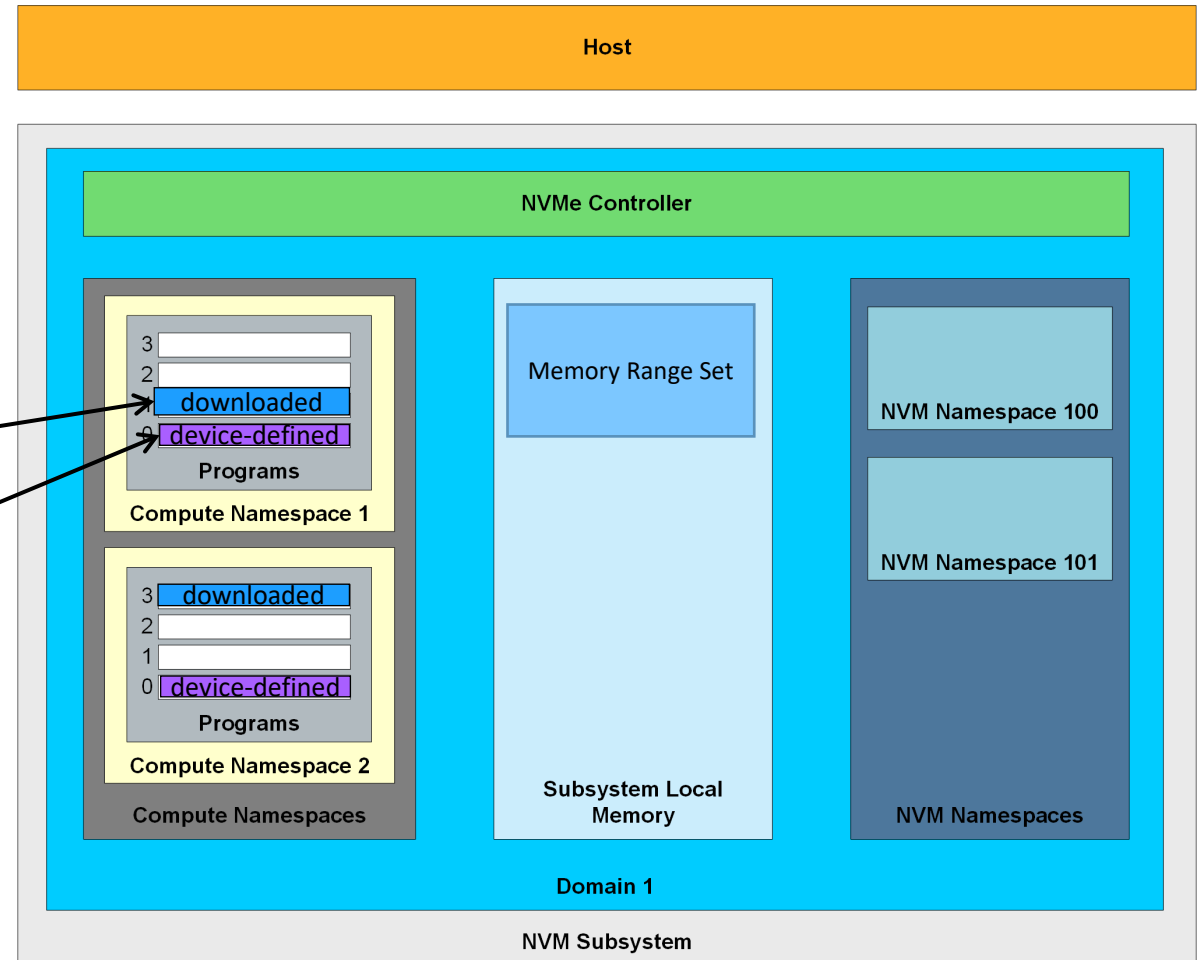
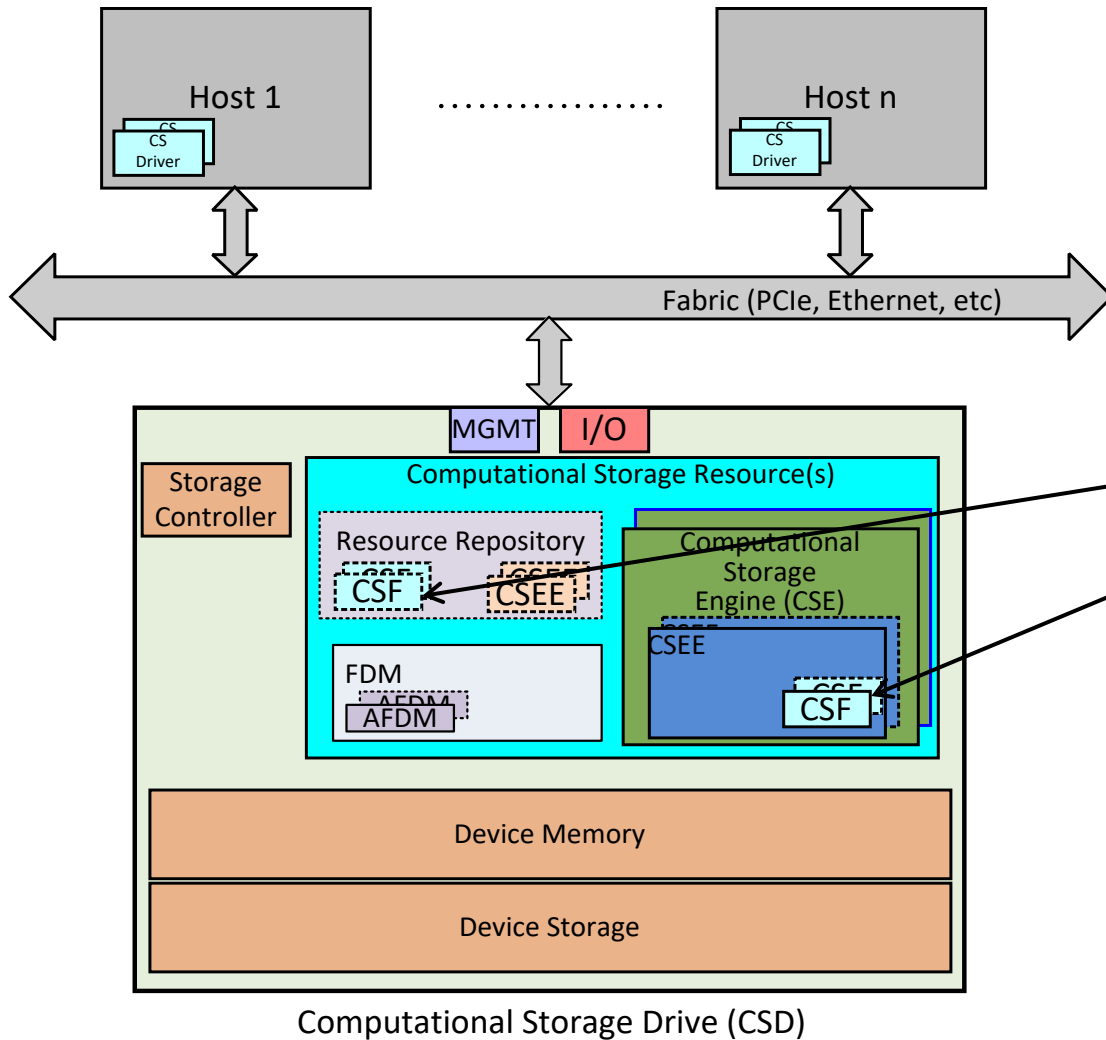
NVMe Terms

- Compute Engine/Compute Namespace
- Virtual (Not Defined)
- Programs
 - Downloaded programs
 - Device-defined programs
- Subsystem Local Memory (SLM)
- Memory Range Set
- NVM Namespaces

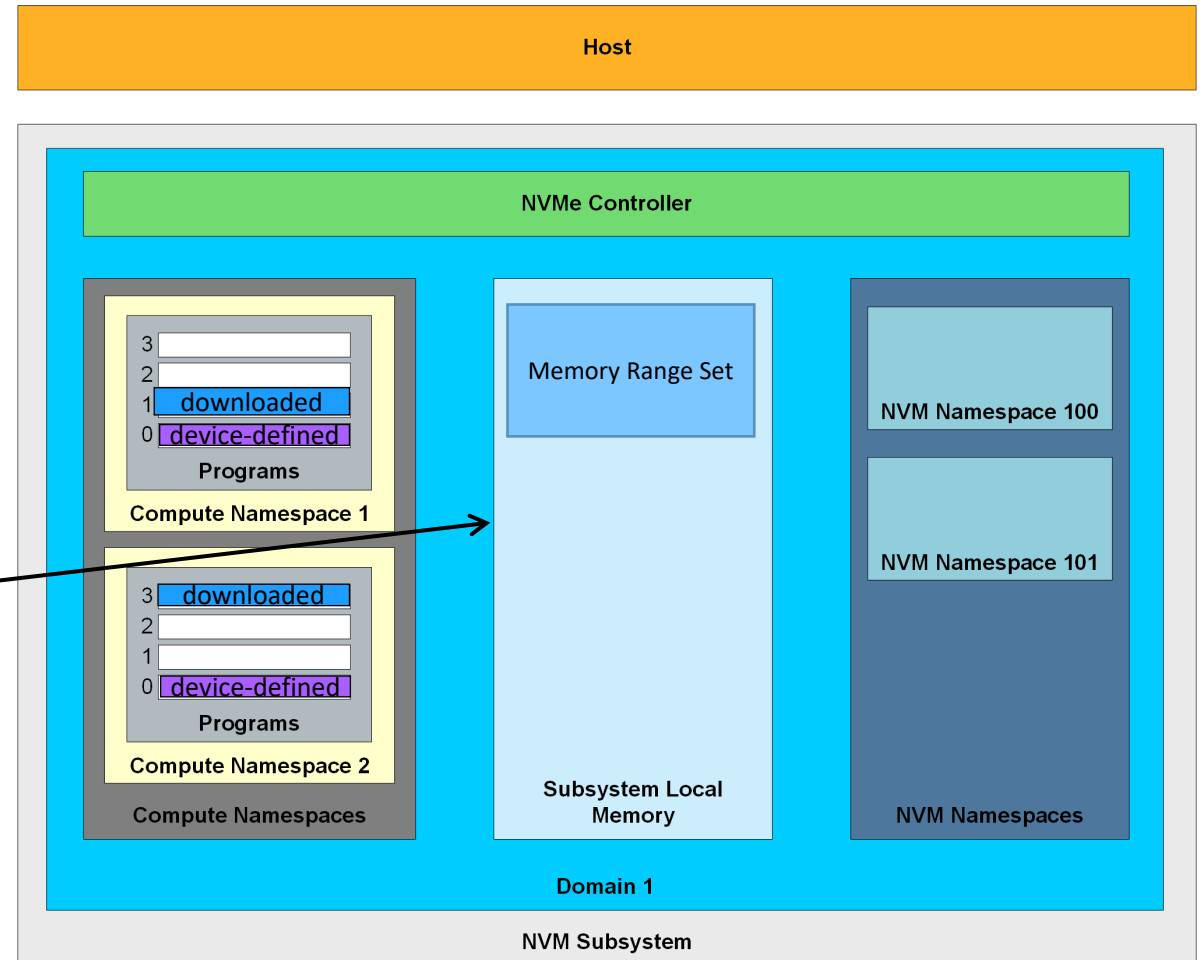
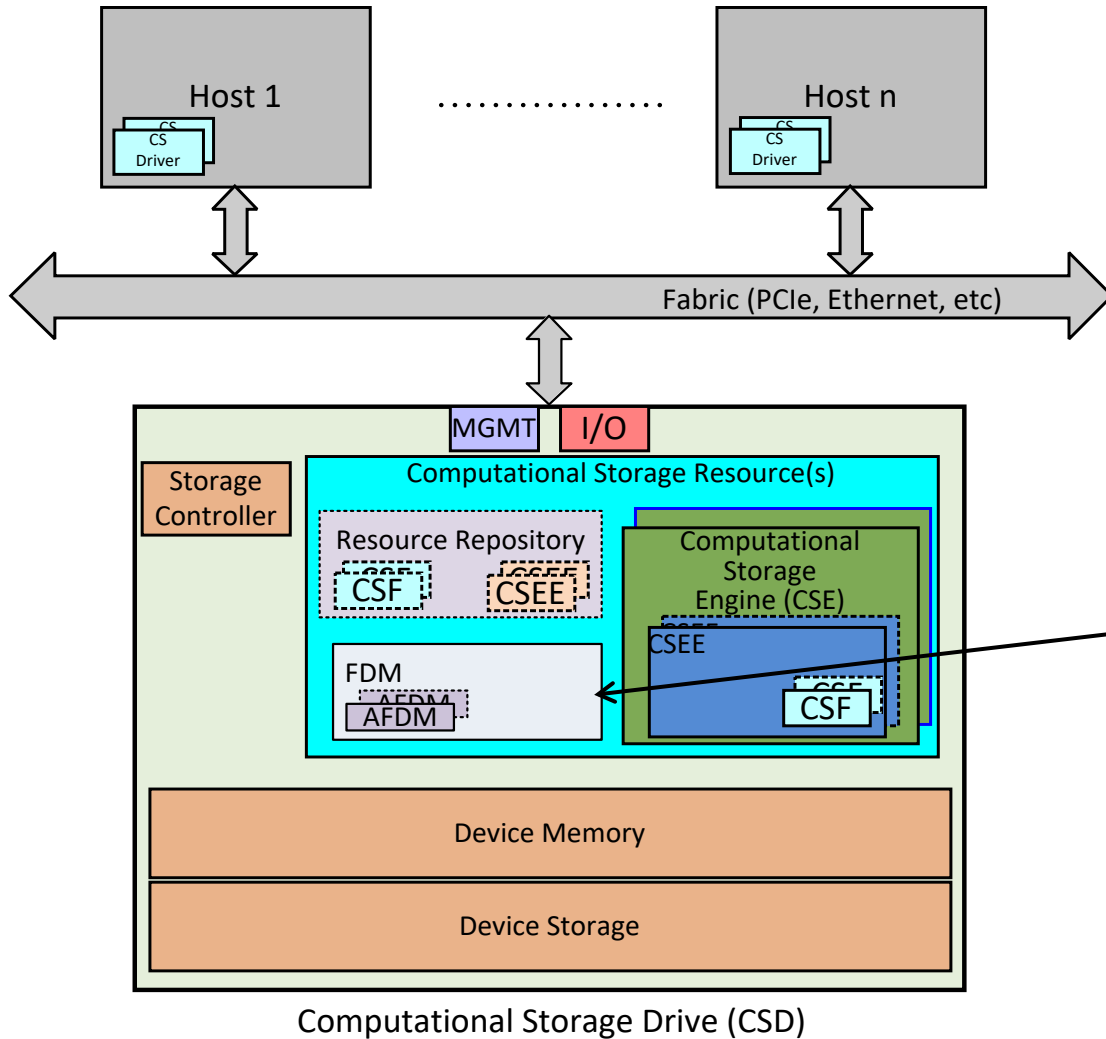
Mapping to NVMe for Computational Storage



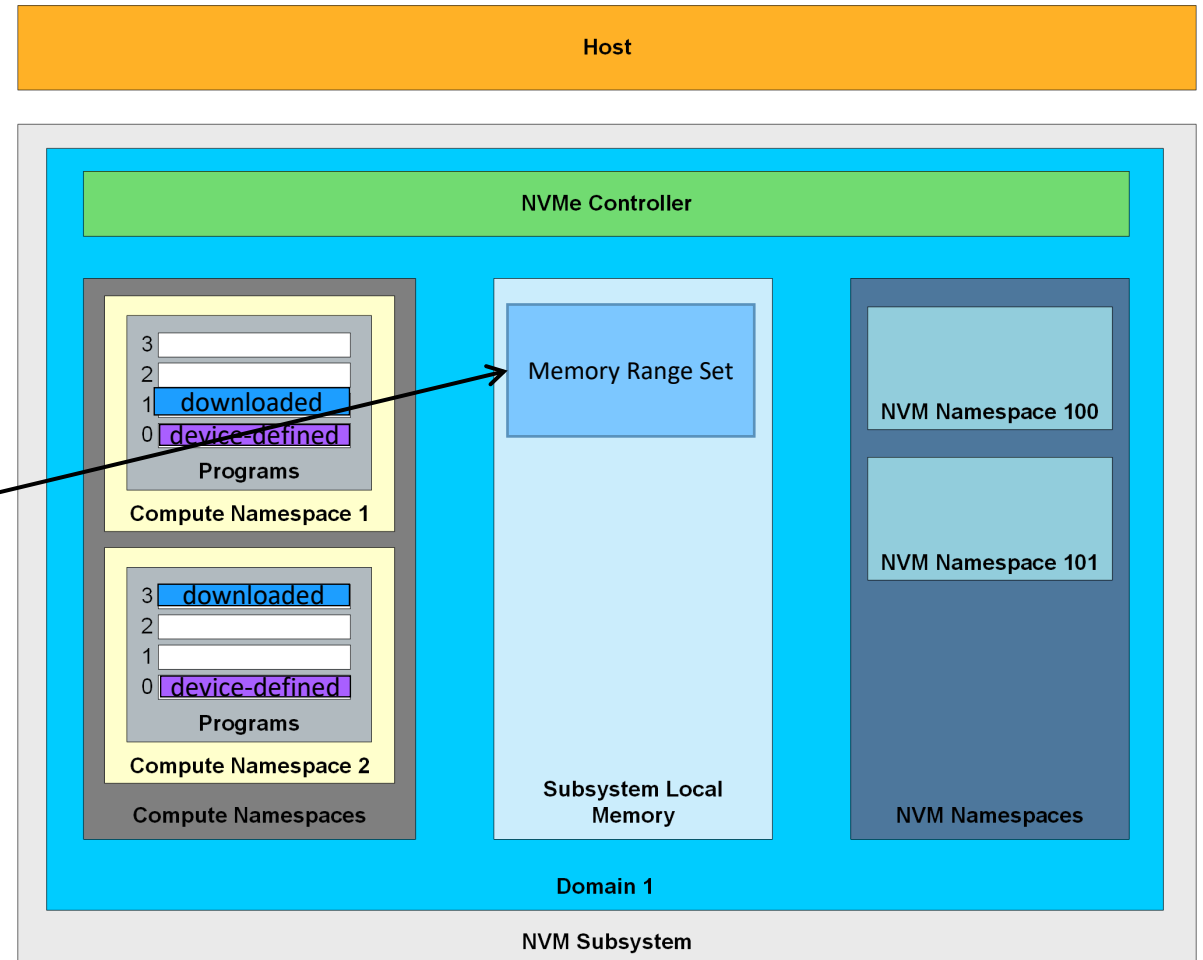
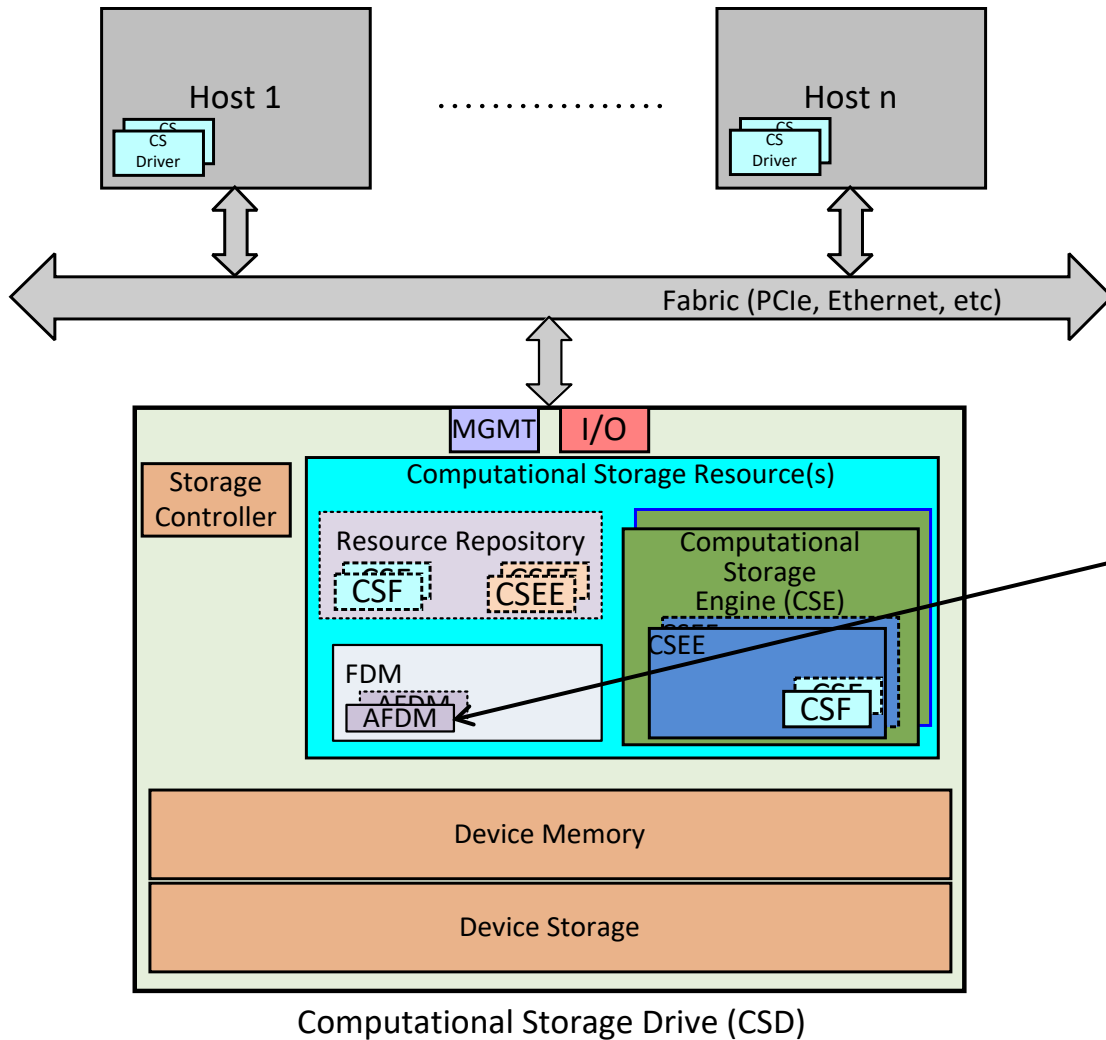
Mapping to NVMe for Computational Storage



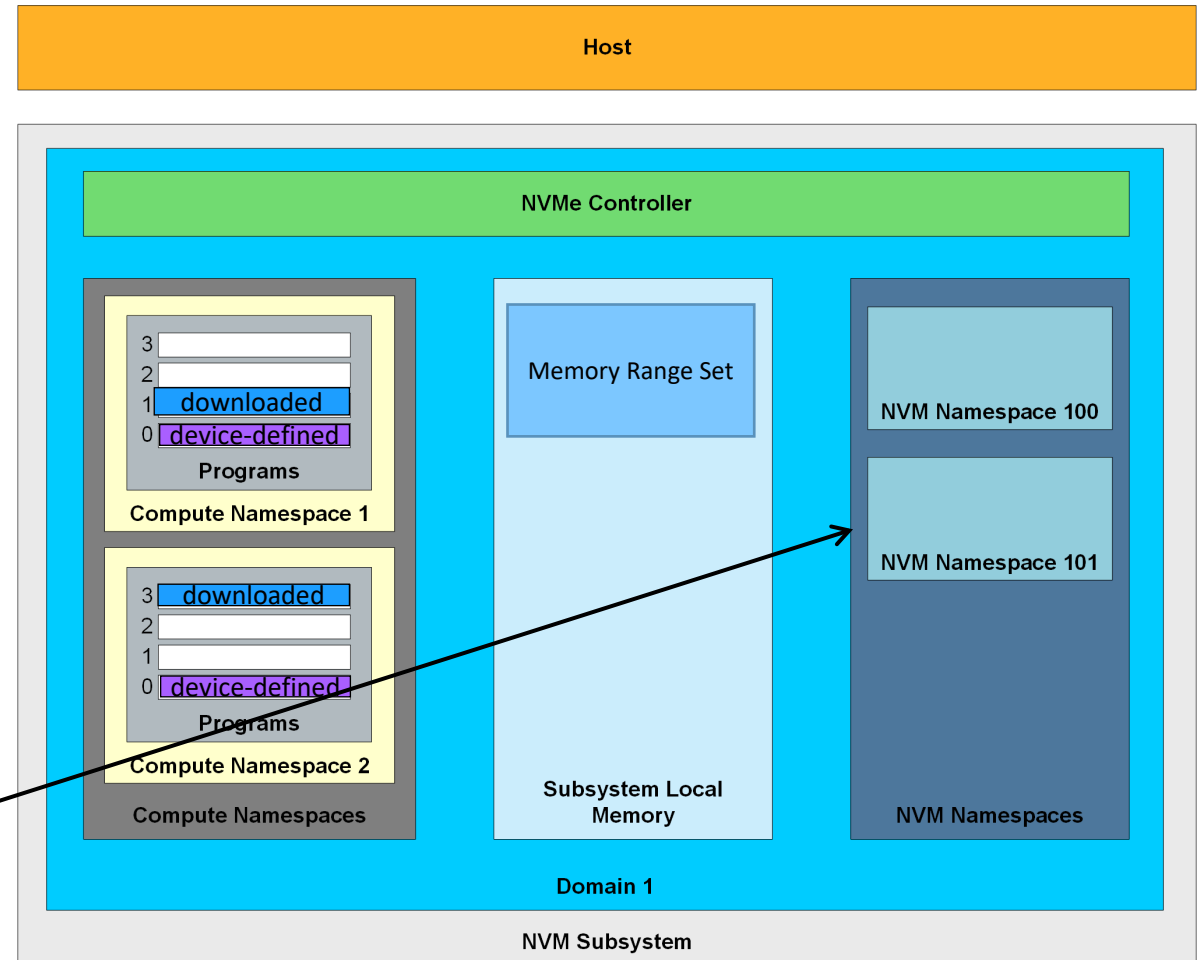
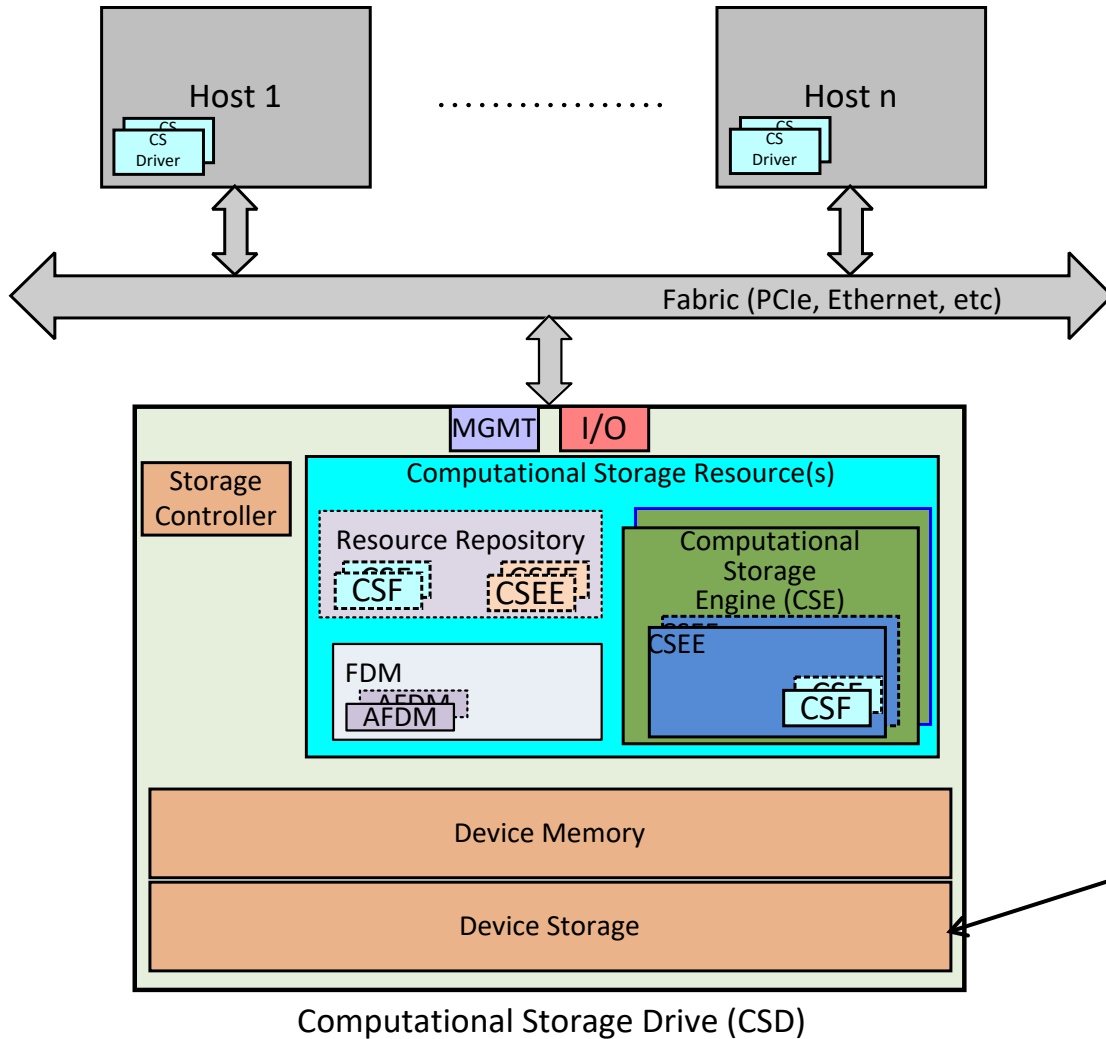
Mapping to NVMe for Computational Storage



Mapping to NVMe for Computational Storage



Mapping to NVMe for Computational Storage



Summary

Summary

SNIA

- A general architectural model for computational Storage
- Flexibility for a variety of protocols

- Related Computational Storage sessions at the Summit include:
 - The Latest Efforts in the SNIA Computational Storage Technical Work Group
 - NVMe Computational Storage - An Update on the Standard
 - Programming with Computational Storage
- Join SNIA and NVMe in the standardization effort

NVMe

- A specific I/O Command Set for computational Programs
- Specific for the NVMe protocol

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