Flash Memory Summit

Computational Storage: How do NVMe and SNIA CS Work Together

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35 YEARS OF NAND FLASH MEMORY INNOVATION

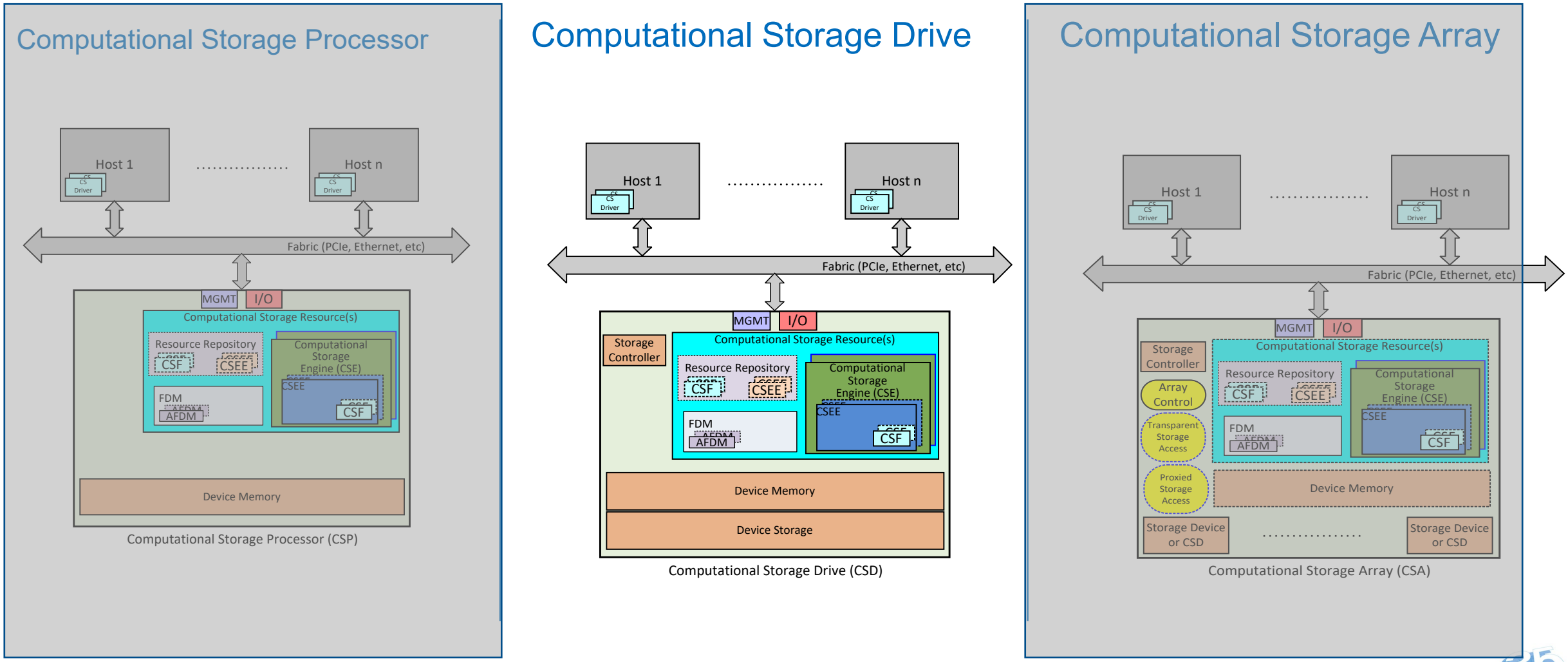
Agenda

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

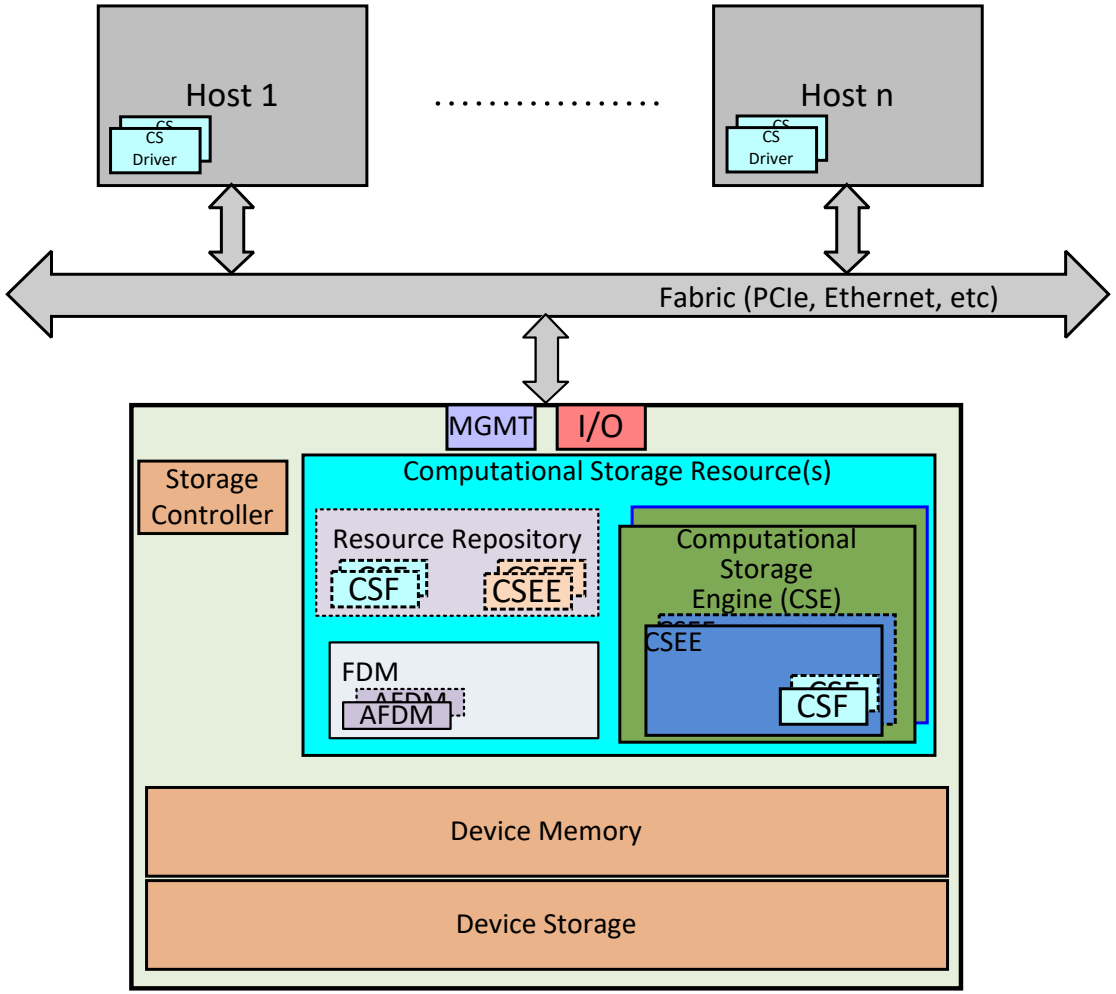
Background presentations

- NVMe Computational Storage - An Update on the Standard
  - Kim Malone, Intel
  - NVME-102-1: NVM Express Technology Innovations (NVMe Track)
- SNIA Computational Storage Technical Work Group (CS TWG) Update
  - Scott Shadley, Strategic Planner, Solidigm
  - Jason Molgaard, Principal Engineer, AMD

SNIA Computational Storage Architecture

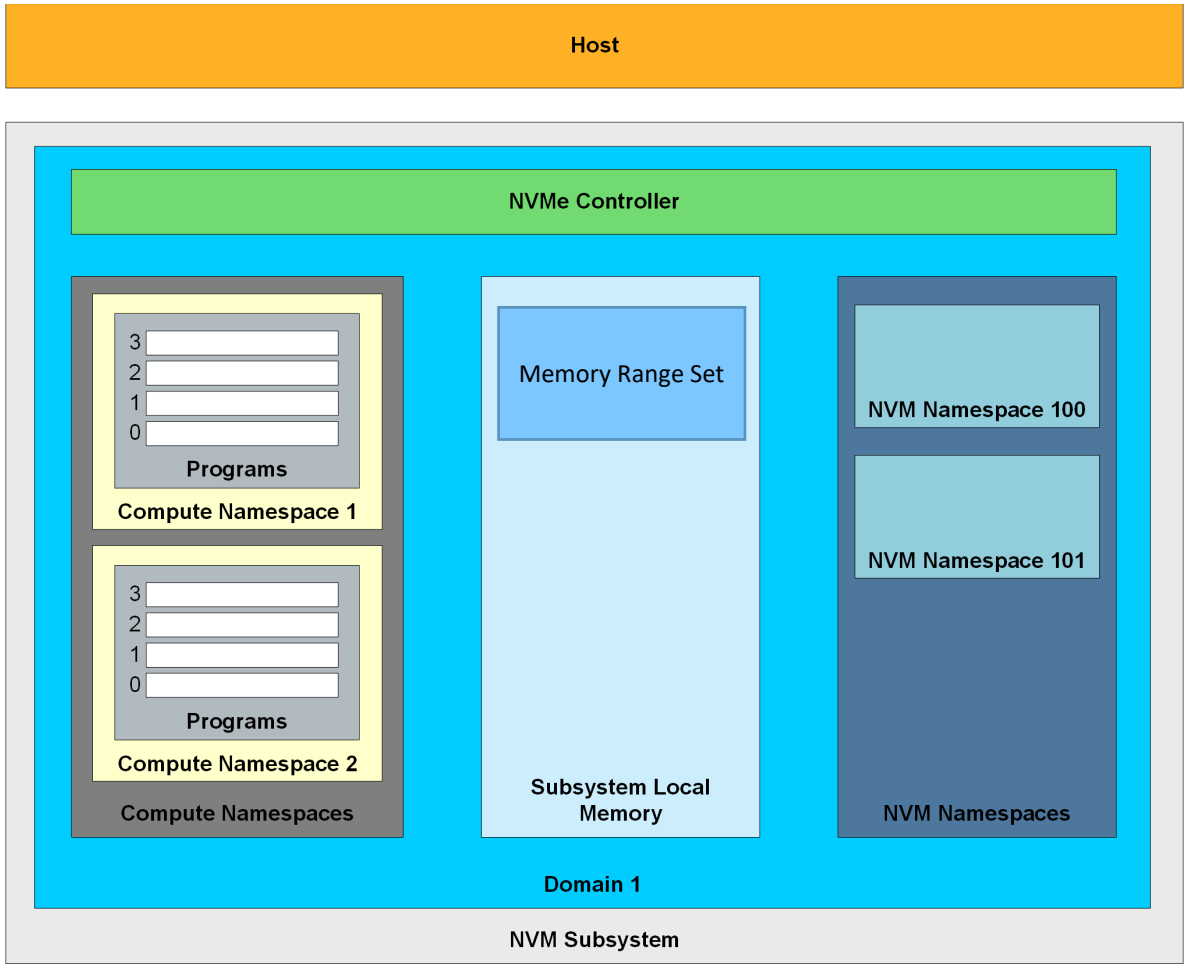


SNIA Architectural Elements for CS Drive



Computational Storage Drive (CSD)

NVMe Computational Storage Architectural Components



- Compute Namespaces
  - Compute Engines
  - Programs
- Programs operate on data in Subsystem Local Memory
  - Allocated as Memory Range Set
  - 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

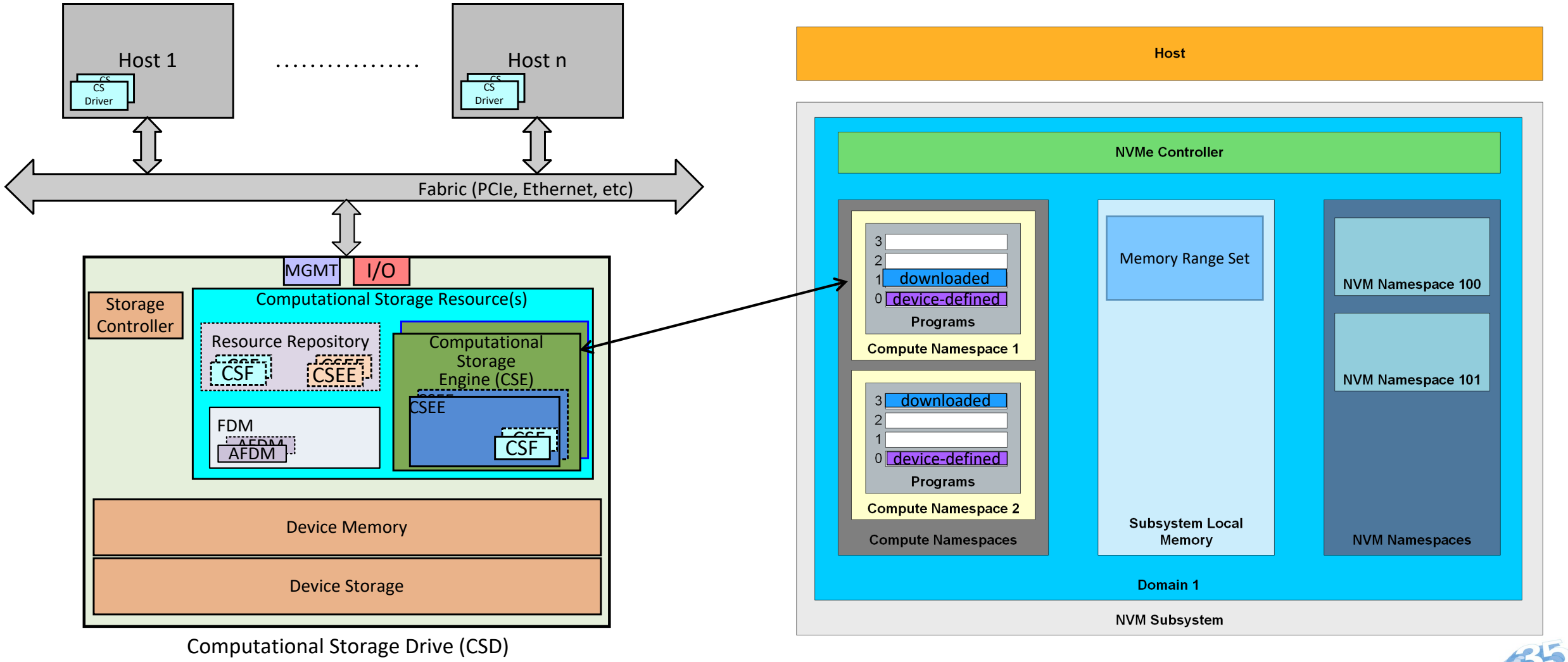
SNIA Terms

- 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



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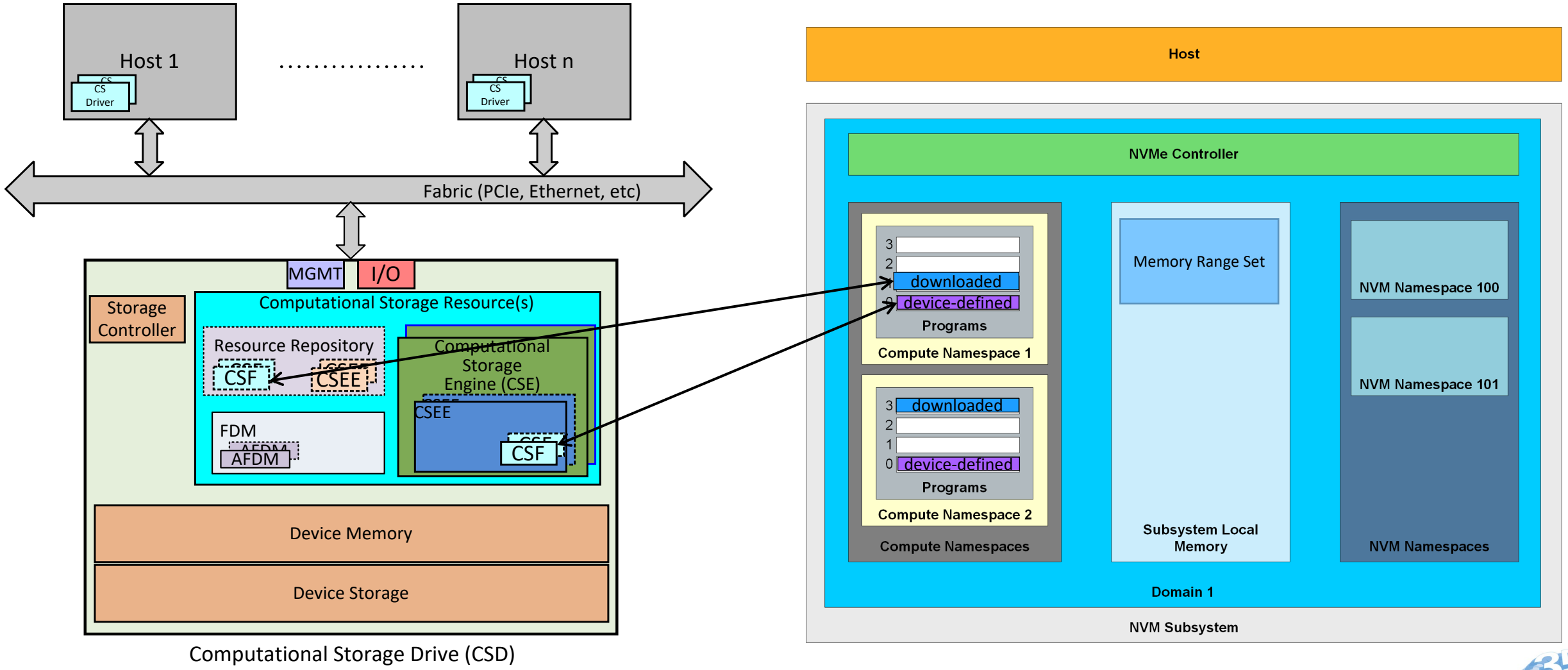
Mapping to NVMe for Computational Storage



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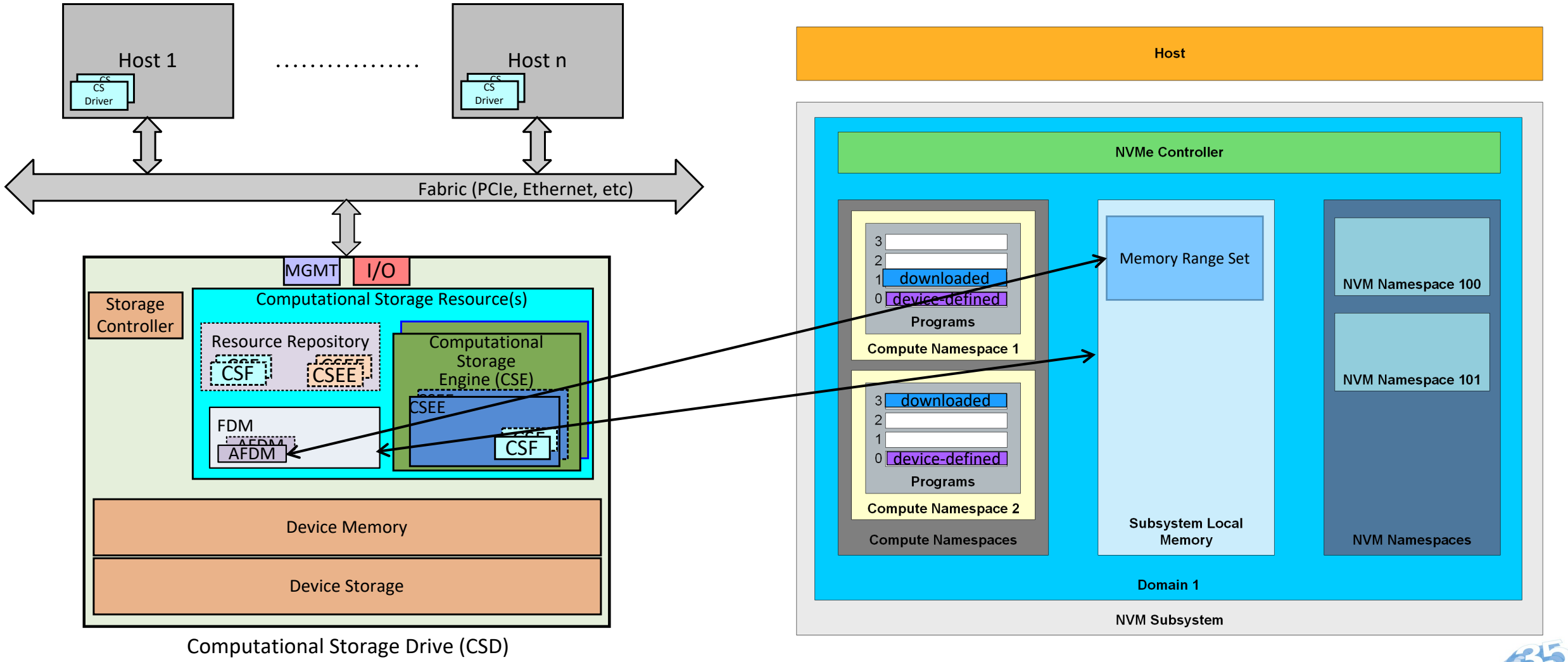

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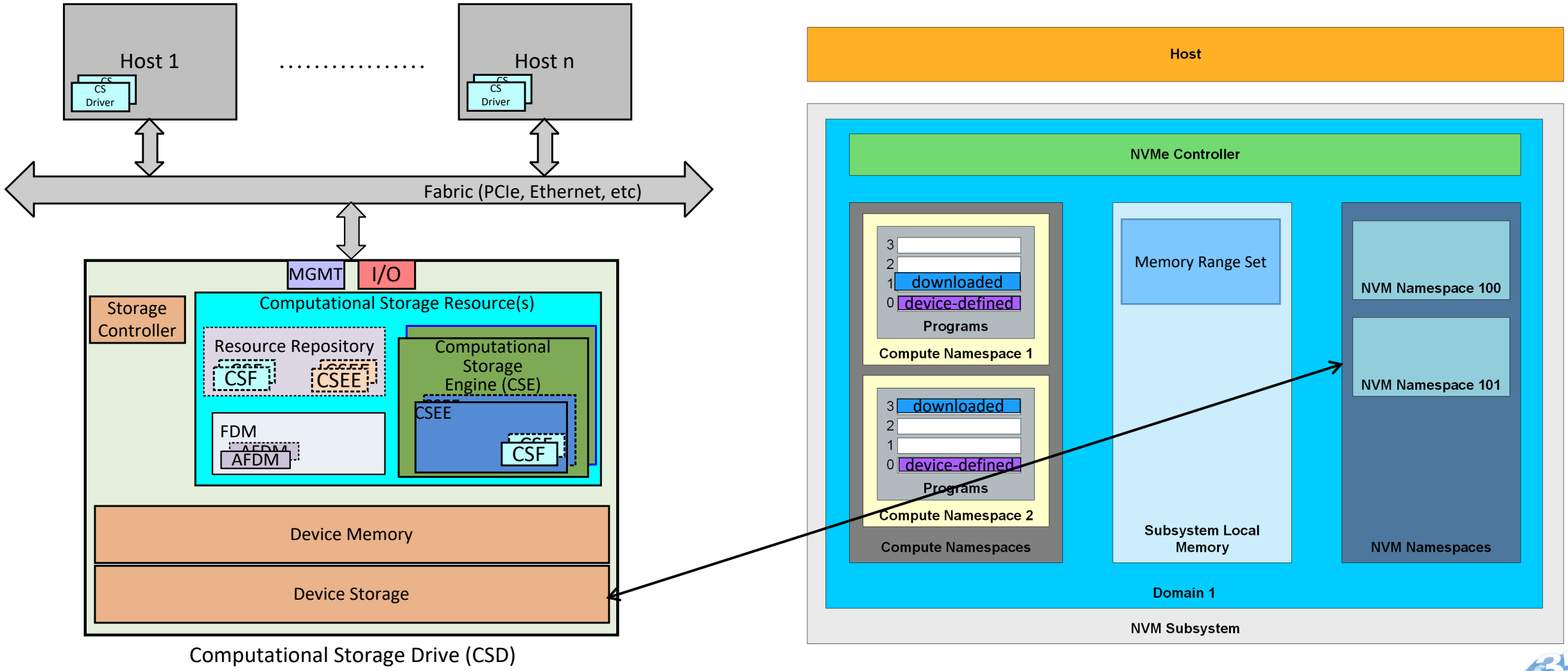
Mapping to NVMe for Computational Storage



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Summary

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SNIA

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

NVMe

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

- Join SNIA and NVMe in the standardization effort

Thank You

