NVM Express™
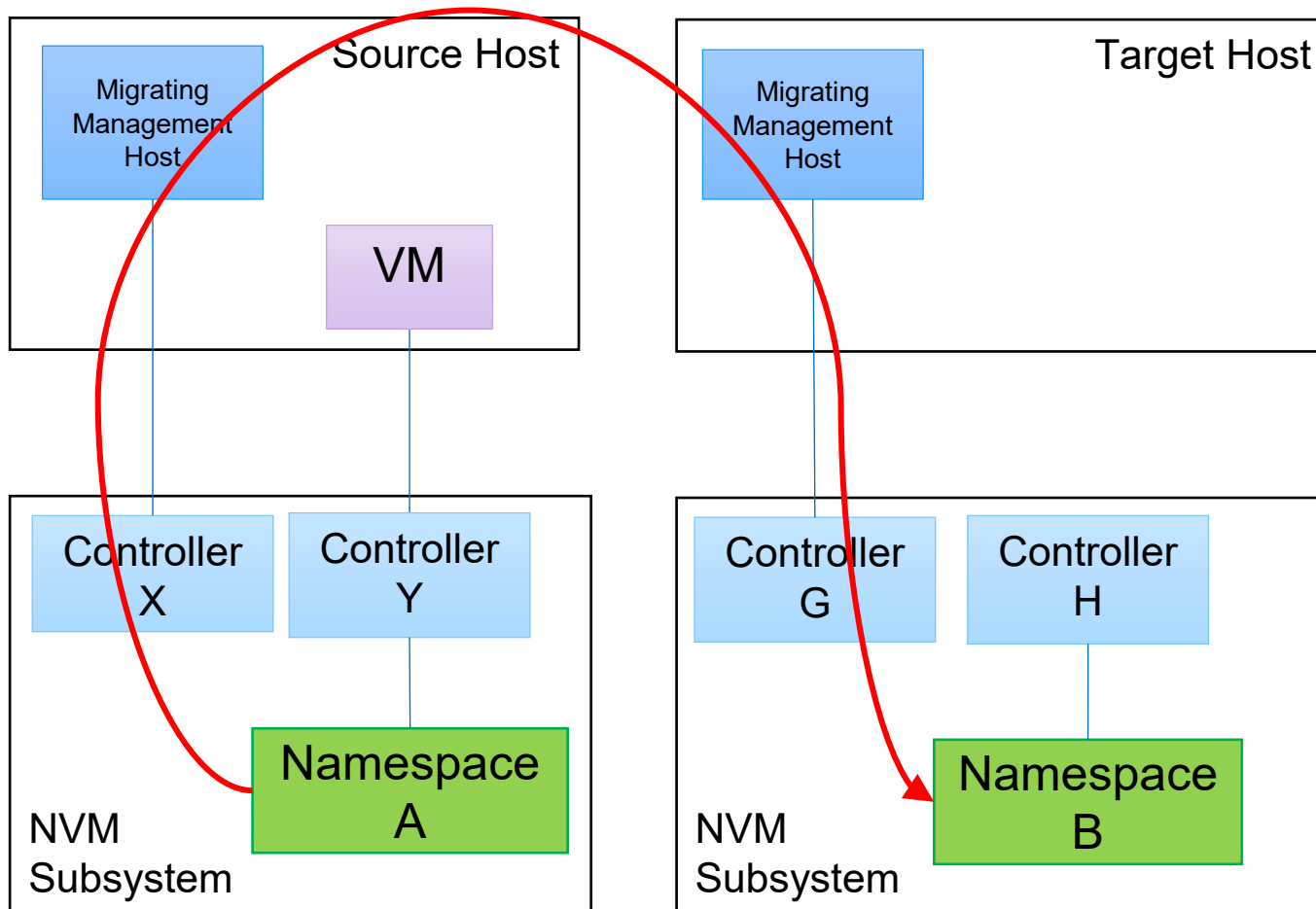# Exported NVM Subsystems Migration

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SNIA

NVM Express™ Exported NVM Subsystem Migration

- Statements during this presentation are directional as this capability is still in development in NVM Express™. The future ratified technical proposal will define the final architecture and protocol.

- Join NVMe™ to influence the development of the capability!

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NVM Express™ Migration History

Source Host
- Migrating Management Host
- VM

Target Host
- Migrating Management Host

NVM Subsystem (Source)
- Controller X
- Controller Y
- Namespace A

NVM Subsystem (Target)
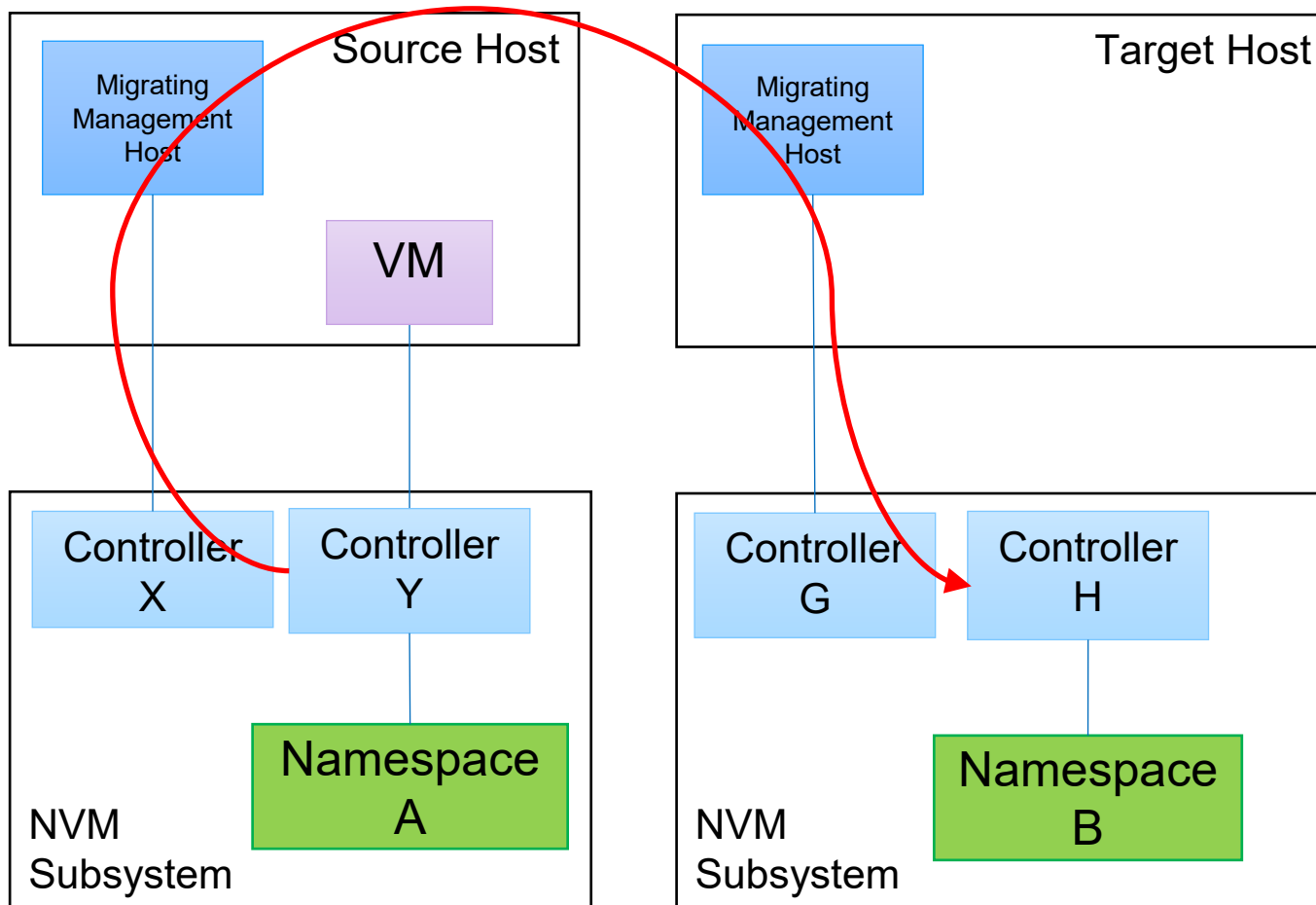- Controller G
- Controller H
- Namespace B

TP4159 PCIe™ Infrastructure Controller Migration

- ### Standardizes Live Migration
  - Namespace
  - Controller

- ### Problem
  - Migrated VM exposed to new information from destination NVMe™ Storage Entities

HyperVisor (HV) is able to trap VM Admin commands and modify the data returned to the VM

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NVM Express™ Migration History

Source Host

Migrating Management Host

VM

Controller X   Controller Y

Namespace A

NVM Subsystem

Target Host

Migrating Management Host

Controller G   Controller H
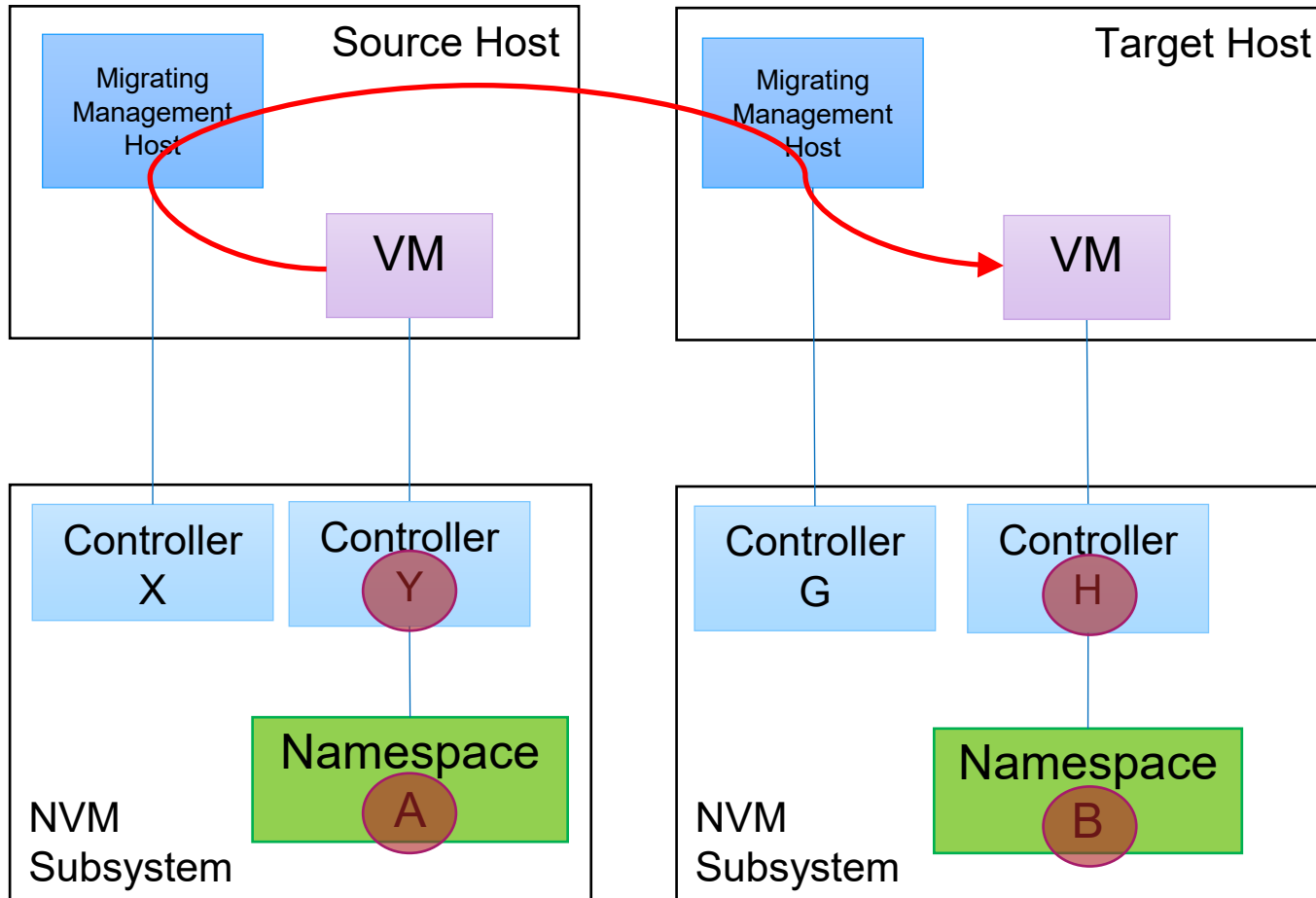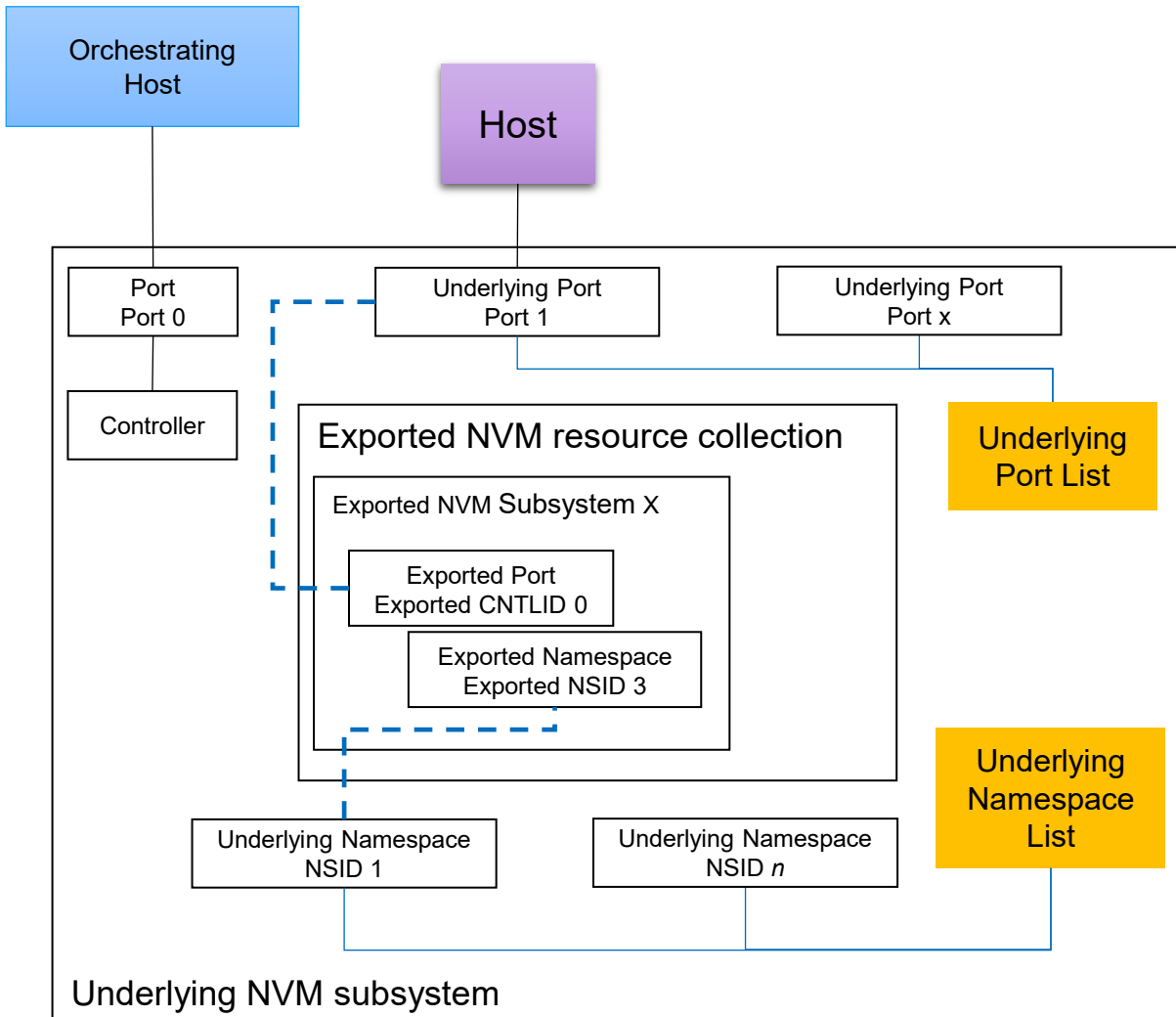
Namespace B

NVM Subsystem

TP4159 PCIe™ Infrastructure Controller Migration

- ## Standardizes Live Migration

  - Namespace
  - Controller

- ## Problem

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NVM Express™ Migration History

TP4159 PCIe™ Infrastructure Controller Migration

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NVMe™ Exported NVM Subsystems

TP6011 Scalable Resource Management

- Scoped to simplify the management of large NVMe-oF™ NVM Subsystems

- Created NVMe-oF Virtual Entities
  - Exported NVM Subsystem
  - Exported Port
  - Exported Namespace

- A host connected to an Exported Port is only allowed access to the exported entities with the Export NVM Subsystem containing that Exported Port

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NVMe™ Exported NVM Subsystems for PCIe™
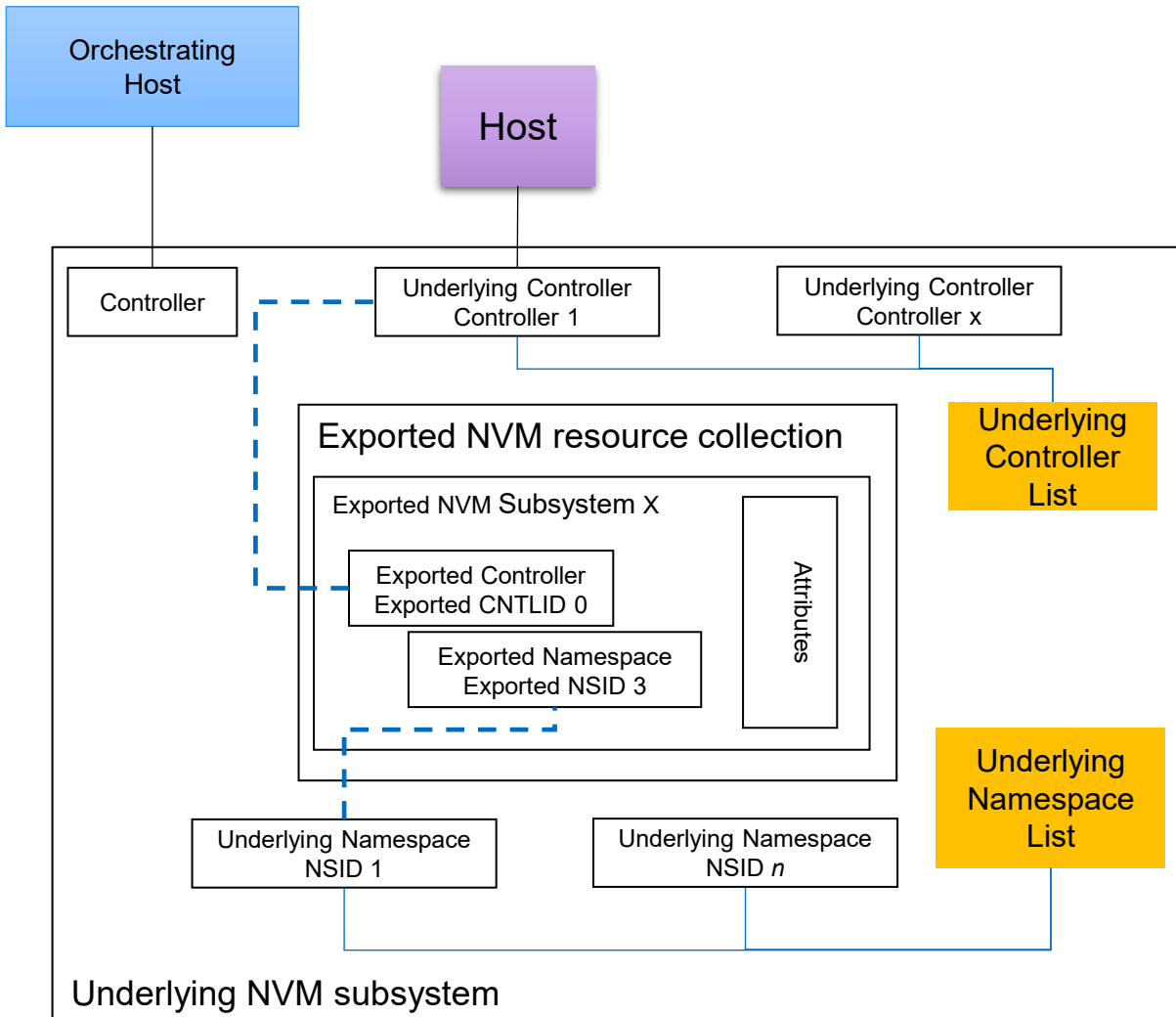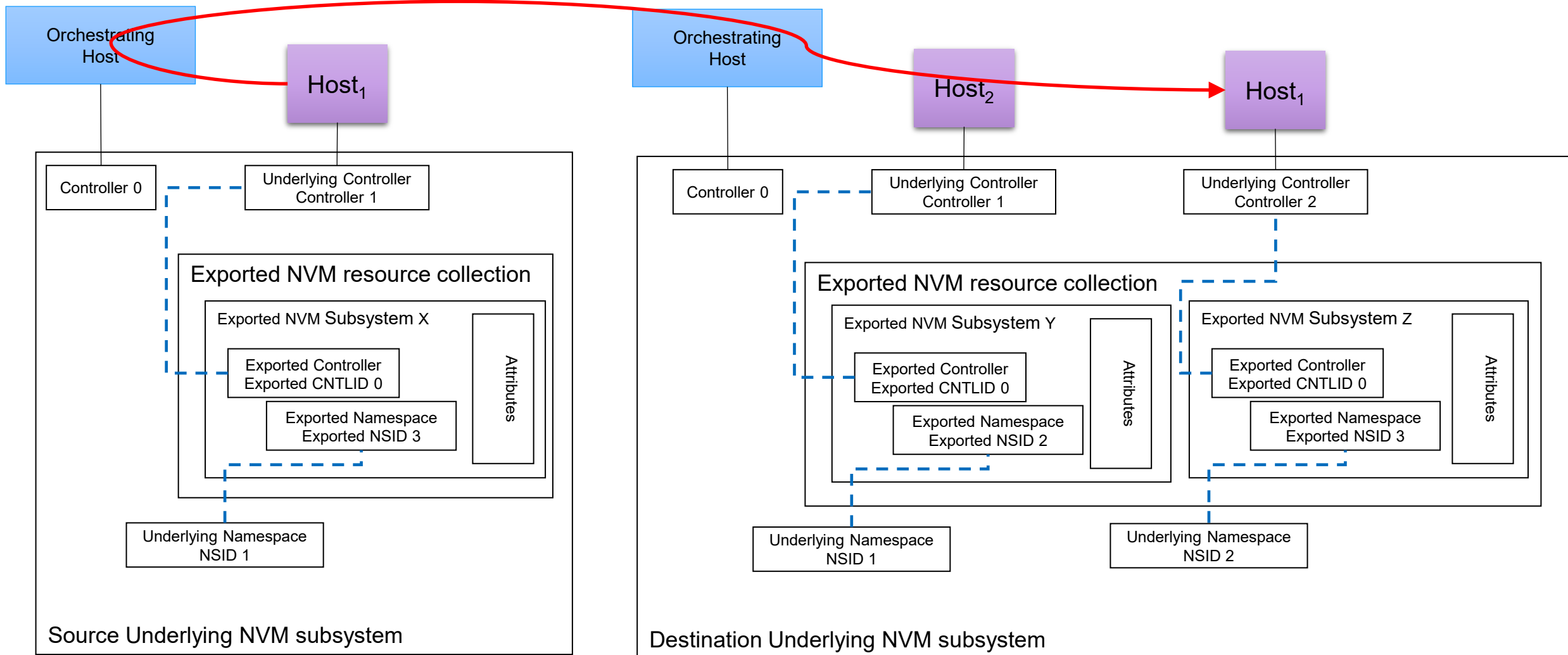

PCIe Exported NVM Subsystem

- Created additional Virtual Entity
  - Exported Controller

- Define migratable Exported NVM Subsystem attributes that contains information to abstract the underlying hardware so reported information can be defined by the Orchestrating Host

  - Unique identifiers
  - Vendor Manufacturing Info
  - Etc.

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PCIe™ Exported NVM Subsystems Migration
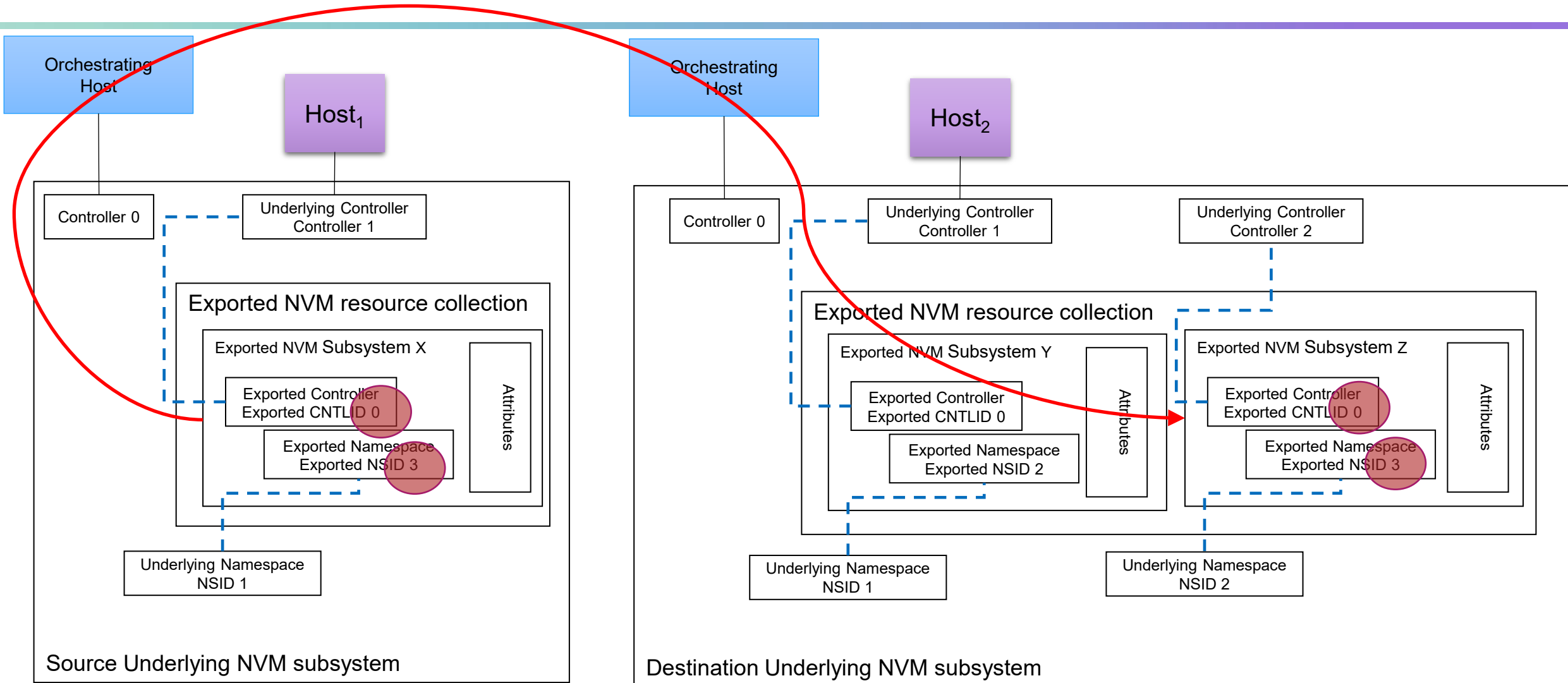
PCIe™ Exported NVM Subsystems Migration

Summary

- Showed the path of supporting the migration in a PCIe™ NVM Subsystem (e.g., SSDs) that includes

  - Expanding Exported NVM Subsystem to support PCIe™

  - Abstracting the underlying NVMe™ storage entities in an NVM subsystems to support migration of VMs without a changing the reported NVMe storage entities

- Planning to present the host usage of this new capability at SNAI SDC 2025 in September

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