NVMe Standard Status

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Agenda

- NVMe™ (NVM Express™)Specifications
- NVMe™ base specification
- NVMe-oF™ (NVM Express™ over Fabrics) specification
- NVMe-MI™ (NVM Express™ Management Interface) specification

Agenda

- NVMe™ Standards documents
- NVMe™ base specification
- NVMe-oF™ specification
- NVMe-MI™ specification

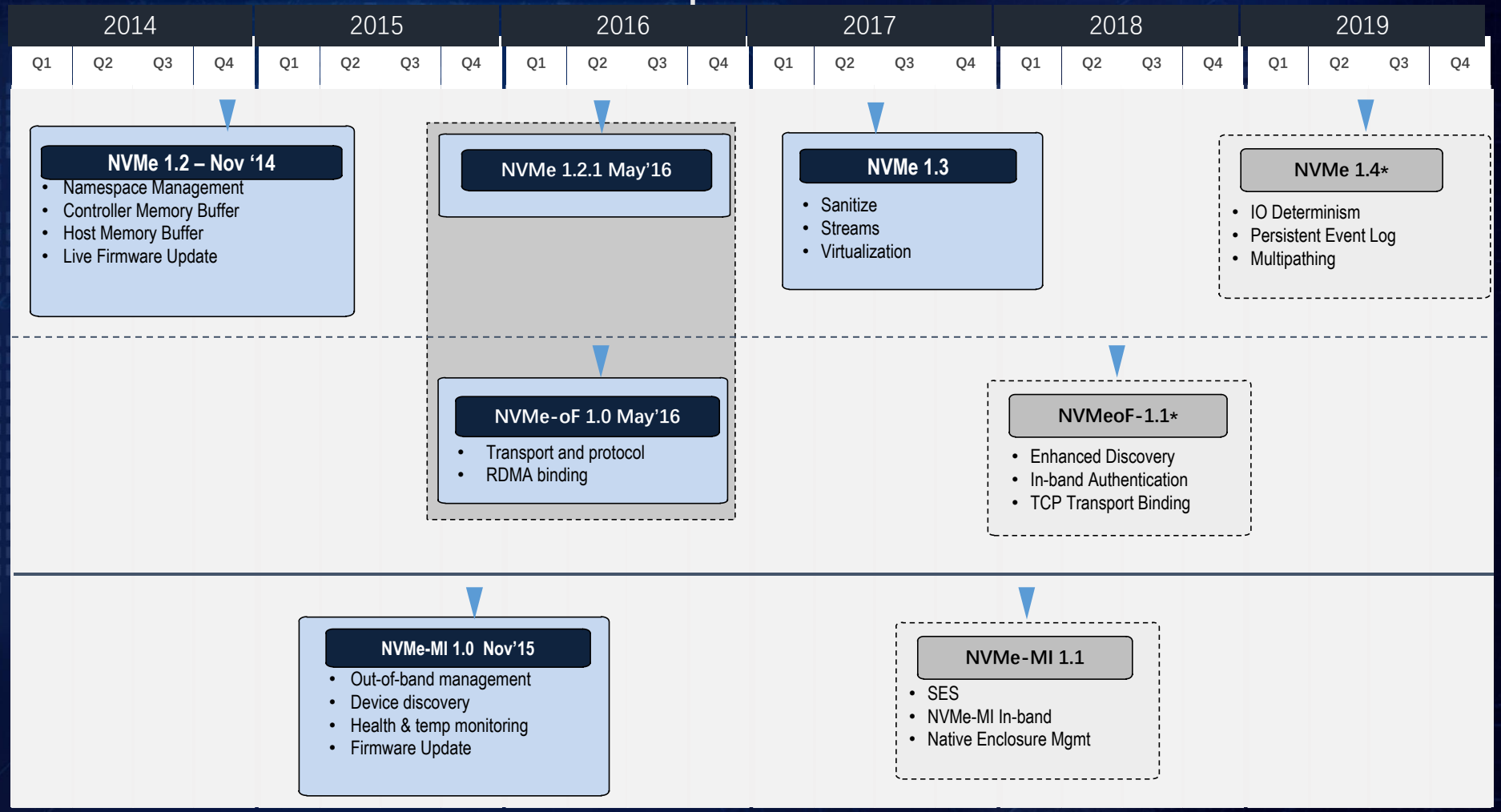
NVMe Standard Specifications

- Three specifications
  - NVMe base specification
  - NVMe-oF specifcation
  - NVMe-MI specification

NVMe Standardization Process

- Technical Proposal Authorization (TPAR)
- Technical Proposal
- Engineering Change Notification (ECN)
- Ratification of TP and ECN
- Ratification of Specification

NVMe Feature Roadmap



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Subject to change

Agenda

- NVMe™ Standards documents
- NVMe™ base specification
- NVMe-oF™ specification
- NVMe-MI™ specification

NVMe base specification

- Current ratified revision is NVMe 1.3a
  - 24 October 2017
    - Sanitize
    - Streams
    - Virtualization
- Proposed to break out the PCIe specific portions of the specification in the next 12 months

Proposed additions to base specification

- NVM Sets
  - IO Determinism
- Persistent Event Log
- Persistent Memory Region
- Multipathing
- Vendor Specific Organization Identifiers
- Key Value command set

Agenda

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NVMe over Fabric (NVMe-oF)

- Current ratified version is 1.0
  - 2016 June 5
- Describes extensions to NVMe that enable operation over interconnects other than PCIe
  - NVMe-oF 1.0 defines RDMA mapping
  - FC-NVMe defines Fibre Chennel mapping
    - defined in INCITS T10

Proposed additions to NVMe-oF

- Enhanced Discovery
- In-band authentication
- TCP transport binding

Agenda

- NVMe™ Standards documents
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- NVMe-MI™ specification

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NVMe Management Interface

- Current ratified version is 1.0
  - 2015 November 17
- Allows a Management Controller to communicate out-of-band with an NVM Subsystem over one or more external interfaces.

NVMe-MI (continued)

- NVMe-MI has the following key capabilities:
- Discover devices that are present and learn capabilities of each device
- Store data about the host environment enabling a Management Controller to query the data later
- Health and temperature monitoring
- Multiple Command Slots to prevent a long latency command from blocking monitoring operations
- Processor and operating system agnostic
- A standard format for VPD and defined mechanisms to read/write VPD contents
- Preserves data at rest security

Proposed additions to NVMe-MI

- SES Enclosure management
- In-band support
- Native PCIe Enclosure management

Where are documents available

- Ratified documents
  - http://nvmexpress.org/resources/specifications/
- Working documents
  - Available to members only
  - Membership link
    - http://nvmexpress.org/join-nvme/
  - Members only site
    - https://workspace.nvmexpress.org/login

Membership benefits

Member Benefit	*Contributor*	*Adopter*
Right to participate in Work Groups	Yes	No
Right to vote as a participant of a Work Group	Yes	No
Right to receive and review Draft Specifications	Yes	No
Right to have access to ratified Technical Proposals	Yes	Yes
Right to participate in the annual all-Member meeting	Yes	Yes
Right to actively participate in the Corporation's marketing and promotional activities at trade shows and other industry events	Yes	Yes
Right to participate in any logo or certification mark licensing program ("Logo Program")	Yes	Yes
Early access to a Final Specification before it is released to the general public.	Yes	Yes

Thank You

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