

NVM Express FAQ

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About the NVM Express Organization

- Tell us about the NVM Express organization and why was it formed?
 - NVM Express is a non-profit industry organization developing an open collection of standards and information designed to fully expose the benefits of non-volatile memory in all types of computing environments from mobile to data center. The NVMe™ specification is designed from the ground up to deliver high bandwidth and low latency storage access for current and future NVM technologies.
 - NVMe was formed to remove the bottlenecks in legacy storage infrastructure designed for hard drives, with a streamlined protocol, scalable performance, and industry standard software and drivers.
- What industries can benefit from NVM Express?
 - NVMe is a scalable technology that spans from mobile phones, desktop computing, enterprise and cloud storage, all the way to data center fabrics, with a core set of features and framework that keeps it efficient while providing optional features for adding differentiated value for segments and applications.
- What are the commercial drivers for NVMe technology?
 - Explosive growth in data in the digital service economy requires faster access to storage for consumers and the cloud infrastructure and data centers to scale these services.
- When will we see broad market deployment?
 - NVMe is mature and reliable. Devices using NVMe have been developed by many suppliers and there is an established ecosystem of suppliers and users. Examples of products in the market can be found on the NVMe website at <http://www.nvmexpress.org/products/>

About the Specifications

- What are the NVM Express specifications that have been published?
 - NVM Express (NVMe)
 - NVM Express Management Interface (NVMe-MITM)
 - NVM Express over Fabrics (NVMe-oFTM)

- Tell us about the NVMe specification?
 - NVM Express, informally NVMe, is an interface specification optimized for PCI Express® based solid state drives. The interface is defined in a scalable manner to efficiently support the needs of Enterprise and Client systems in a flexible way.
- What are the benefits of the NVMe specification?
 - NVMe is an optimized, high performance, scalable host controller interface designed for Enterprise and Client PCIe SSDs. NVM Express revolutionizes storage by delivering faster access to data and lowering power consumption. This reduces the Total Cost of Ownership for Enterprise and extends battery life for mobile clients. NVM Express streamlines the legacy storage stack to significantly reduce latency, delivers higher Input/Output Operations per Second (IOPS) for a lower Total Cost of Ownership. Additional benefits for Enterprise and Client platforms include:
 - Performance across multiple cores to quickly access critical data
 - Scalability with headroom for current and future NVM performance
 - End-to-end Data protection capabilities and support for standard security protocols, such as Trusted Computing Group
- When will NVMe-based devices be available in the market?
 - NVMe is mature and reliable. Devices using NVMe have been developed by many suppliers and there is an established ecosystem of suppliers and users. Examples of products in the market can be found on the NVMe website at <http://www.nvmexpress.org/products/>
- Why is NVMe good for the data center?
 - NVMe removes the bottlenecks in your data center. Architected for performance, NVM Express provides the capabilities to meet the demands of Cloud, Internet Portal Data Centers, and other High-Performance Computing environments. For caching or across multiple drives, the benefits include:
 - Unprecedented Input/Output Operations per Second (IOPS)
 - Performance across multiple cores to quickly access critical data
 - An optimized register interface and command set that simplifies host software, device firmware, and results in fewer CPU cycles per IO
 - Scalability with headroom for current and future NVM performance
 - End-to-end Data protection capabilities and support for standard security protocols, such as Trusted Computing Group

- Lower power consumption resulting in a lower Total Cost of Ownership and carbon footprint.
- Is NVMe only for Enterprise applications?
 - NVMe Express was designed for both Enterprise and Client applications. NVMe Express is an optimized, high performance, scalable host controller interface designed for Enterprise and Client PCIe SSDs. NVMe Express has an optimized and lean set of mandatory features. Optional capabilities are defined for both Enterprise and Client segments. For example, there is an optional Reservations feature for multipath configurations in Enterprise and there is an optional autonomous power state transition feature for additional power savings in Client. An SSD vendor selects the appropriate set of features based on customer need in each segment.

About the Interface and Fabrics

- What is the NVMe Express Management Interface (NVMe-MI™)
 - NVMe-MI is the command set and architecture for out of band management of NVMe Express storage (e.g., discovering, monitoring, and updating NVMe devices using a BMC).
 - NVMe-MI offers an industry standard way to manage NVMe devices in a much broader range of operating conditions and agnostic of host operating systems.
- What is the NVMe Express over Fabrics (NVMe-oF™)
 - The extension to NVMe Express that enables tunneling the NVMe Express command set over additional transports beyond PCIe. NVMe over Fabrics extends the benefits of efficient storage architecture at scale in the world's largest data centers by allowing the same protocol to extend over various networked interfaces.
- Can you tell us about what NVMe will be working on in the future?
 - NVMe will continue to create standards that benefit our member companies and our industry at large. I would invite interested companies to join us and take advantage of the opportunity the NVMe organization provides to define next generation non-volatile memory from requirements to specifications.

About the Organizational Structure and Membership

- Do you need to be a member to implement the NVMe specification(s)?

- No, the specifications are open for use by the industry at large and are available at <http://www.nvmexpress.org/specifications/>
- Do you need to be a member to contribute to NVMe specification(s)?
 - Any company may join the Workgroup as a Contributor by signing the Participation Agreement and paying the membership dues. All Contributors have equal input into the development and evolution of the specification. The agreement can be found on the Join NVM Express page at <http://www.nvmexpress.org/join-nvme/>.
- How is NVM Express structured?
 - NVM Express is an incorporated non-profit industry organization. There are 3 categories of members, Promoters, Contributors, and Adopters. The NVM Express group is led by 13 Promoter companies who have board seats and provide overall governance. Promoters are elected and serve two-year terms. Contributor companies are welcome to participate in regularly scheduled technical working sessions that develop specifications and in marketing sessions to further adoption of the interface in the industry. Adopters have access to ratified Technical Proposals and are welcome to participate in NVM Express Marketing activities. Additional information is available in the Organization Bylaws located at <http://www.nvmexpress.org/join-nvme/>
- Who are the companies that form the NVM Express Promoters Group?
 - The Promoters Group is composed of 13 delegates, elected from the industry's top storage, infrastructure and software companies.
- How can organizations become a member of NVM Express?
 - The NVMe membership application process is simple. Download and fill out the participation agreement found on the NVMe website and send it in. You will be invoiced for the applicable membership dues and once paid, your membership begins.
 - Information on joining NVM Express, membership dues and benefits are located on the Join NVM Express page at <http://www.nvmexpress.org/join-nvme/>.