



# NVM Express State of the Union

Sponsored by NVM Express™ organization, the owner of NVMe® Family of Specifications

# Speaker



**Amber Huffman**  
**Principal Engineer**



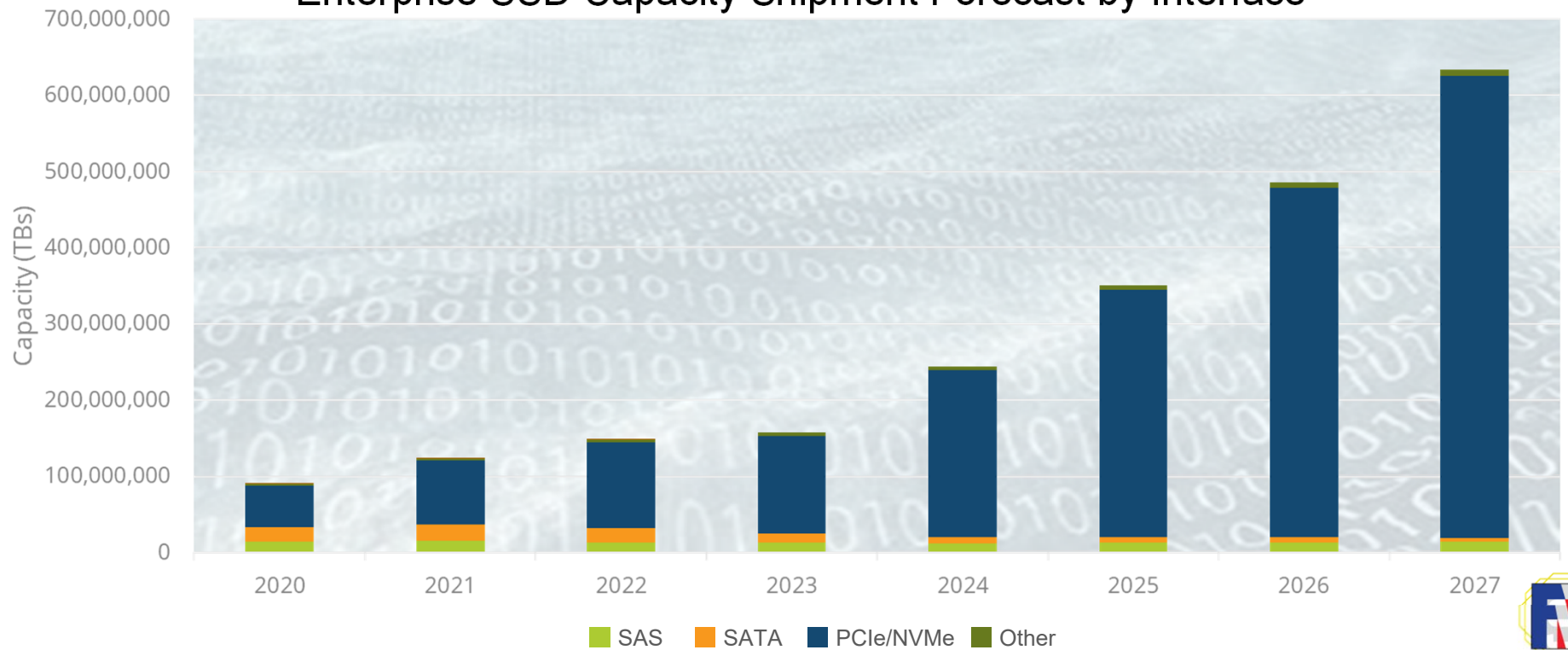
Flash Memory Summit

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# NVMe<sup>®</sup> Specifications – The Language of Storage

## Enterprise SSD Capacity Shipment Forecast by Interface



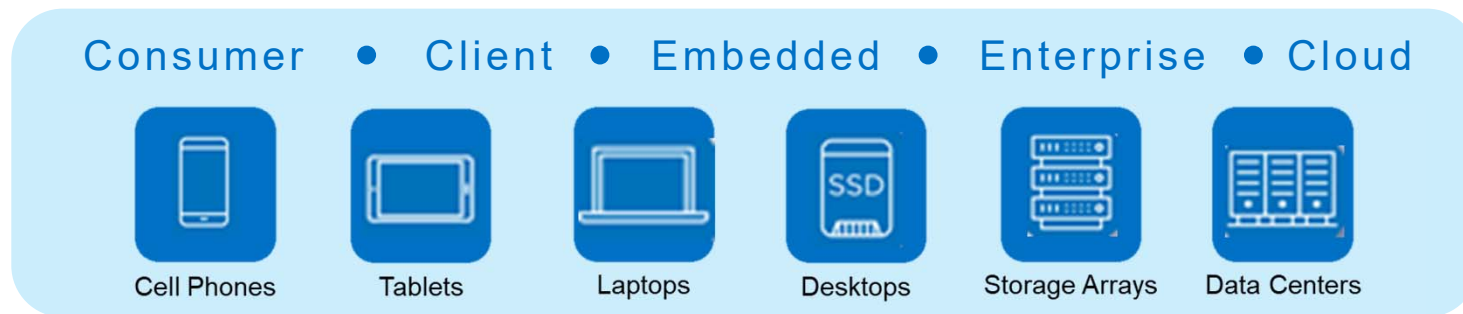
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# NVMe<sup>®</sup> Technology Powers the Connected Universe

Petabytes	2021	2022	2023	2024	2025	2026	2027
Enterprise	32,483	42,973	37,094	48,602	65,701	82,499	106,106
Cloud	73,191	86,307	53,534	89,678	128,164	175,730	237,949
Client	145,610	157,304	200,391	274,530	350,518	437,054	517,991



# NVM Express Organization

## Board of Directors

Chair: Amber Huffman  
Treasurer: Curtis Ballard  
Secretary: Dave Landsman

## Technical Workgroup

Chair: Peter Onufryk

## Marketing Workgroup

Chair: Cameron Brett, Kerry Munson

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## Computational Storage

Chairs: Kim Malone, Bill Martin

## Fabric & Multi-Domain Subsystem

Chair: Fred Knight, Erik Smith

## Management Interface

Chairs: Austin Bolen, John Goldman

## Interoperability and Compliance

Chair: Ryan Holmqvist

## NVMe<sup>®</sup> over Fabrics (NVMe-oF<sup>™</sup>) Boot

Chairs: Phil Cayton, Rob Davis, Doug Farley

## Errata

Chair: Mike Allison



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# Board of Directors

Elections occur yearly

 DELL EMC

 intel.

 Hewlett Packard  
Enterprise

 Google

 Microsoft

 Western Digital

 Meta

 NetApp™


 SAMSUNG

 MARVELL™

 Micron®

 SEAGATE

 SOLIDIGM™

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# Organizational **Enhancements**



Tooling Updates  
*Zoom, Causeway, Bugzilla*



Errata Taskgroup



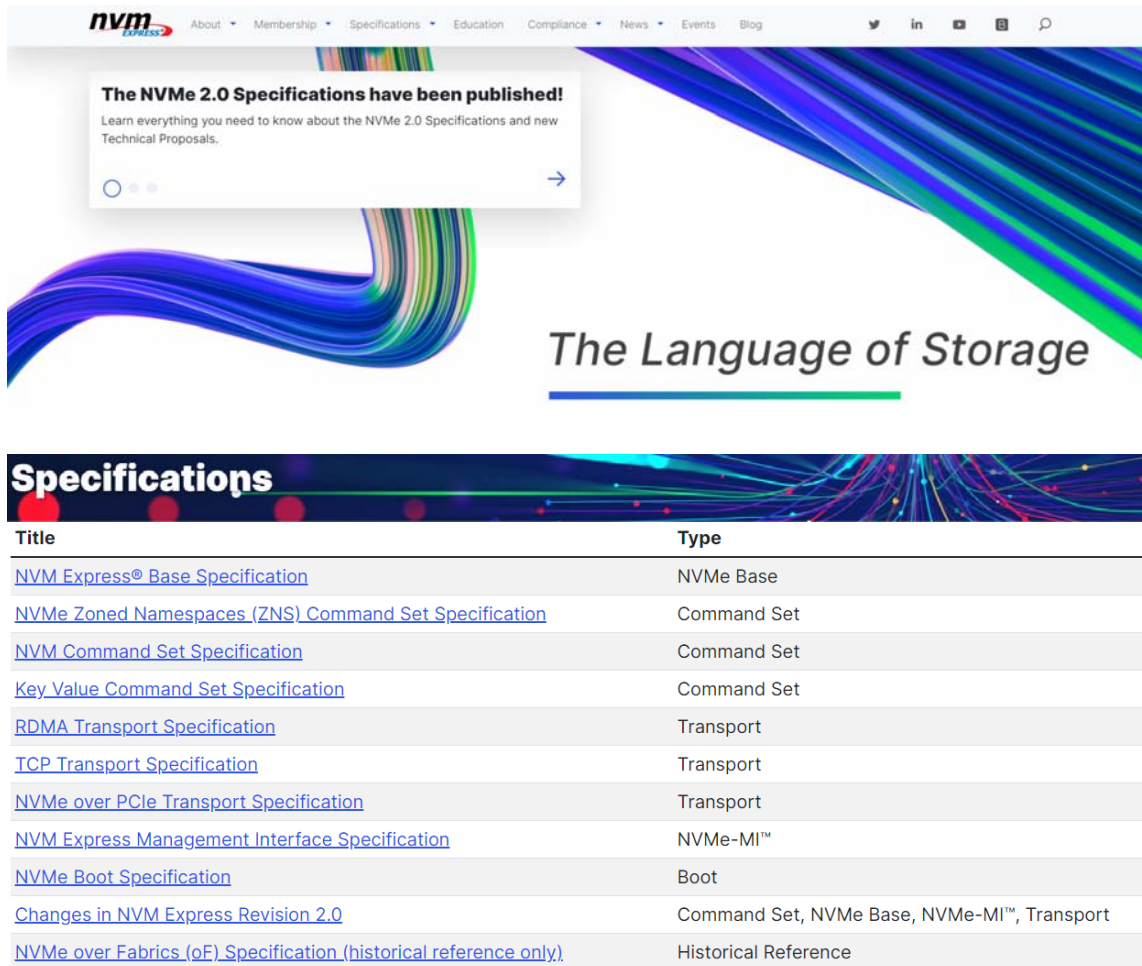
Website Redesign



Software Taskgroup  
Framework



# Modernizing the NVM Express Website



The screenshot shows the NVM Express website with a navigation menu at the top. A prominent banner features the text "The NVMe 2.0 Specifications have been published!" and "The Language of Storage". Below the banner is a table of specifications.

Title	Type
<a href="#">NVM Express® Base Specification</a>	NVMe Base
<a href="#">NVMe Zoned Namespaces (ZNS) Command Set Specification</a>	Command Set
<a href="#">NVMe Command Set Specification</a>	Command Set
<a href="#">Key Value Command Set Specification</a>	Command Set
<a href="#">RDMA Transport Specification</a>	Transport
<a href="#">TCP Transport Specification</a>	Transport
<a href="#">NVMe over PCIe Transport Specification</a>	Transport
<a href="#">NVM Express Management Interface Specification</a>	NVMe-MI™
<a href="#">NVMe Boot Specification</a>	Boot
<a href="#">Changes in NVM Express Revision 2.0</a>	Command Set, NVMe Base, NVMe-MI™, Transport
<a href="#">NVMe over Fabrics (oF) Specification (historical reference only)</a>	Historical Reference

Refreshed pages

Updated user interface

Consolidated & reorganized  
*Specifications*  
*Blogs*  
*Webinars*





# Resources to Learn About NVMe<sup>®</sup> technology



The screenshot shows the 'Education' page of the NVM Express website. It features a search bar, a list of articles with thumbnails, and a navigation menu at the top. The navigation menu includes: About, Membership, Specifications, Education, Compliance, News, Events, and Blog. The 'Education' page title is prominent at the top left.

The screenshot shows the 'Blog' page of the NVM Express website. It features a search bar, a list of articles with thumbnails, and a navigation menu at the top. The navigation menu includes: About, Membership, Specifications, Education, Compliance, News, Events, and Blog. The 'Blog' page title is prominent at the top left. The articles listed include: 'Overcoming the Write Amplification Problem With NVMe Express Flexible Data Placement', 'NVMe 2.0 Specifications: Enabling Efficient Boot Over NVMe Transports', 'Open Source NVMe SSD Management (OSM) - NVMe Command Line Interface (CLI)', and 'Wrapping Up 2022 - Looking Ahead to the Continued Expansion of Key NVMe Express Technology Features in 2023'.

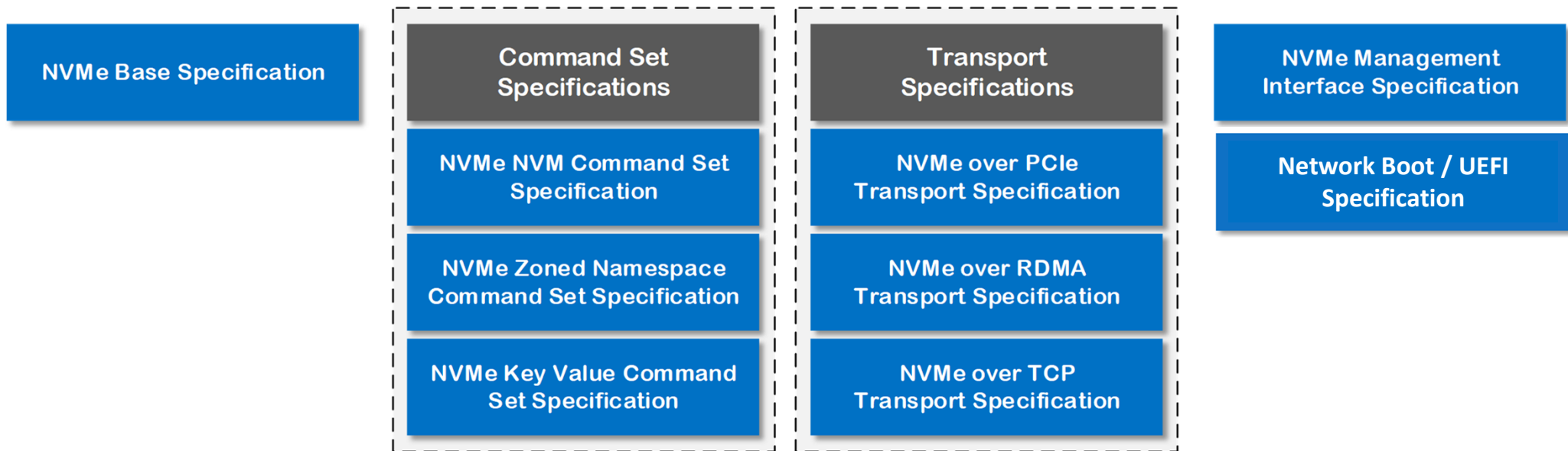
The screenshot shows a YouTube channel page for NVM Express. It features a search bar, a list of videos with thumbnails, and a navigation menu at the top. The navigation menu includes: Home, About, Posts, and Jobs. The 'Page posts' section shows a post titled 'Educational Resources' with a link to visit nvmexpress.org/education/. The channel has 3,104 followers and is active 1 day ago.



The screenshot shows a LinkedIn profile page for NVM Express. It features a search bar, a list of posts, and a navigation menu at the top. The navigation menu includes: Home, About, Posts, and Jobs. The 'Page posts' section shows a post titled 'Educational Resources' with a link to visit nvmexpress.org/education/. The page has 3,104 followers and is active 1 day ago.



# NVMe<sup>®</sup> 2.0 Family of Specifications



NVMe 2.0 specifications were released on June 3, 2021  
Refer to [nvmexpress.org/developers](https://nvmexpress.org/developers)

# Activity Since Release of NVMe<sup>®</sup> 2.0 Family of Specifications\*

New Authorized  
Technical Proposals

60

Ratified  
Technical Proposals

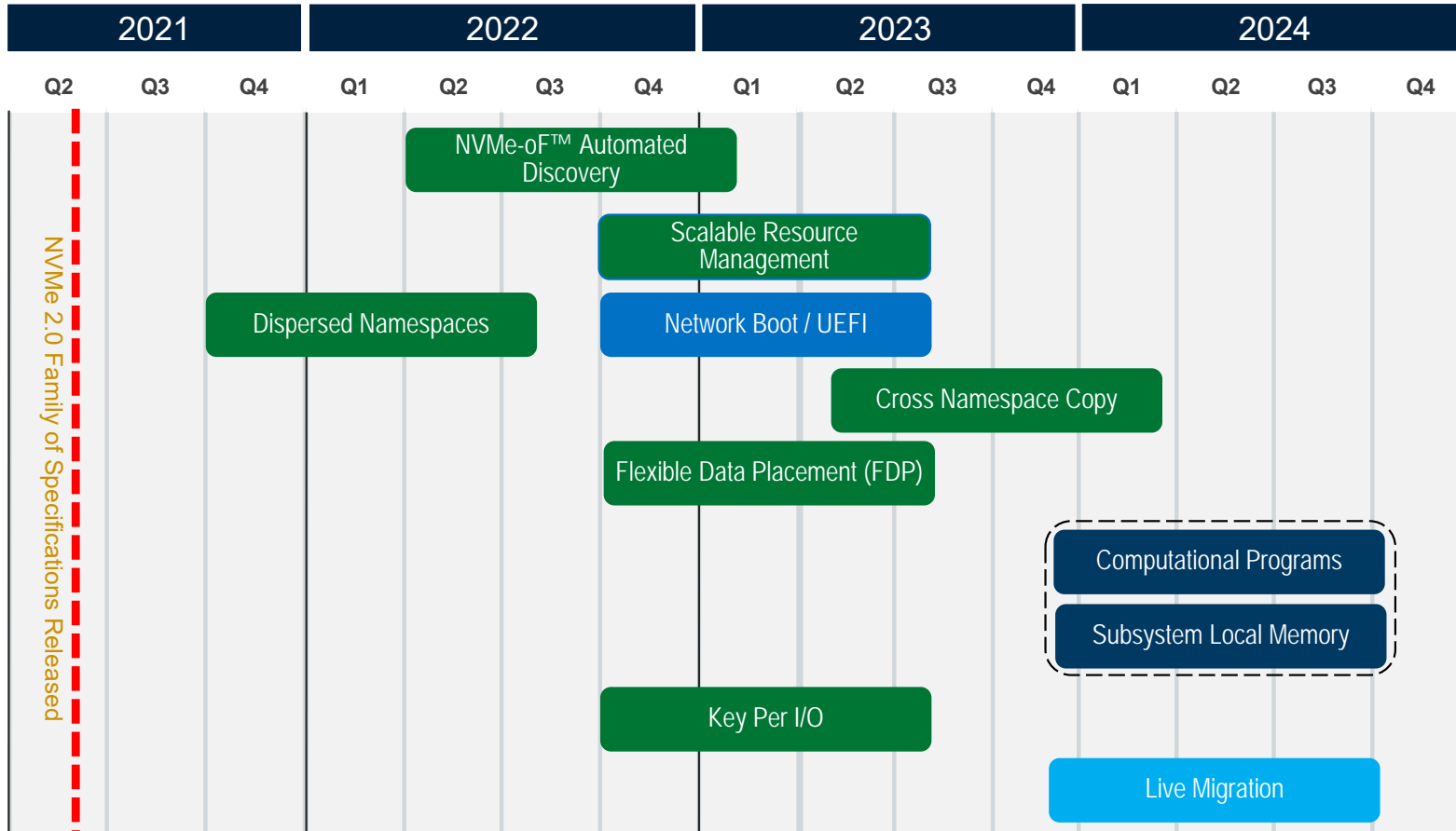
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Ratified ECNs

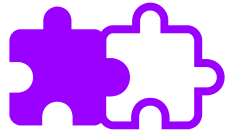
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\* Activity as of 7/28/2023

# NVMe<sup>®</sup> Specifications Feature Roadmap



# Specification **Advancements**



Flexible Data Placement  
*Reducing Write Amplification*



Network Boot / UEFI  
*New Network Storage Functionality*



Computational Storage  
*Executing Programs within a Device*



Live Migration *new feature!*  
*Seamlessly Move Data across vMachines*

# *The Union is Strong and Delivering Value!*



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*Architected for Performance*



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