



**University of  
New Hampshire**  
Interoperability Labs

# From Lab to Market: The Impact of UNH-IOL's NVMe SSD Testing

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University of New Hampshire InterOperability Lab

# Why is NVMe SSD Testing Important And How Does it Help the Industry?

There are still new features to be worked out, and even old features that are not being implemented properly (according to the specifications!)

## Agenda

1. Introduction to the UNH-IOL
2. Overview of the NVMe SSD Testing Program
3. NVMe Interop and Compliance Case Study
4. What is Coming Next
5. Wrap-Up & Takeaways

About

# Who We Are

IOL is a neutral and independent lab that tests networking and data communications products for businesses across the globe.

We started in 1988 on the University of New Hampshire Durham, NH campus.

We are a non-profit organization and 100% funded by commercial industry.

Since 2012, NVM Express has collaborated with UNH-IOL to manage the Integrator's List based Test Program on behalf of NVM Express Organization.





## UNH-IOL and NVM Express Organization

Since 2012, NVM Express has collaborated with UNH -IOL to manage the Integrator's List based Test Program on behalf of NVM Express Organization.

IOL Hosts the NVMe Integrators List.



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# Products Listed on the NVMe Integrator's List

436

Unique NVMe®  
IL Devices

92

NVMe-oF  
Products



# Test Plan Development Process



## # 1

Major updates to test plans happen twice a year in order to keep pace with updates to the NVMe® specifications being developed at NVMe.org

## # 2

All Test Plan updates are created by NVMe interop and Compliance Committee.

## # 3

All updates are approved and voted on by the NVMe Technical Work Group and the NVMe Board of Directors.

## #4

All new tests added are made FYI, since in many cases there are no existing product in the market. This gives time for the Test Plan, DUT, and test scripts to be further validated.



# The Challenge: What are the Problems We Face as an Industry are Trying to Solve?

What We Wanted to Share...



# Case Study Interview Framework



Business Impact	Technical Impact
Have you seen an increase in customer satisfaction for any of your services incorporating NVMe compliant products (any year to year comparison)?	Has IOL NVMe testing established internal benchmarks for your organization?
Have you seen a reduced time to market or increased satisfaction for any NVMe compliant products compared to non-tested products?	What challenges or constraints were you facing that led you to seek testing or compliance services?
In what ways has NVMe compliance helped you achieve your goals or deliver value to your customers?	What industry trends influenced your decision to adopt NVMe compliance testing?

# Case Study Interview Framework..TL;DR!



Business Impact	Technical Impact
Better Customer Experience?	What benchmarks are set by ICC testing?
Quicker Time to Market?	Why did you need external testing?
Increased Value for Customers?	Industry Trends that caused NVMe Testing Adoption?

**We structured a case study, but  
full data wasn't available in  
time for this presentation!**



# But here's what we have observed Through NVMe Interop and Compliance Testing

...and what happens after testing?

# The Sum of All Parts

## Business Cases

- PC OEM Customers require validation testing, NVMe ICC testing provides such validation testing
- The NVMe Integrator's Listing provides visibility and trust to the new devices
- NVMe ICC participation speeds time to market, reduces failures, and boosts vendor credibility.



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## Technical Cases

- Testing brand new features at time of release is especially important "any new feature in a new version of NVMe spec like 2.0x."
- Expertise from the test lab has been invaluable to address specification questions
- Early testing drives test plan maturity by turning real-world issues into actionable feedback.

# Future Features in Focus

## NVMe 2.1-2.3 Features

- PCIe Infrastructure for Live Migration
- Security enhancements such as support for TLS 1.3
- NVMe-oF Security Configurations
- Flexible Data Placement
- Self Reported Drive Power





# Why Future Ready Testing Matters

New features are becoming increasingly complex and cross -layered.

- Live Migration uses multiple controllers, and potentially multiple transports
- Security requirements are becoming increasingly important and strict, and there is a gap between testing and implementations
- Sustainability is one of the most important aspects of all technologies moving forward



# Timeline of Future Updates and Releases



# Call to Action and Takeaways

Shaping the Future Together

1. NVMe Interop and Compliance testing directly improves product readiness
2. Even without full case study data, we see clear trends: faster time to market, better quality, and stronger ecosystem trust.
3. Companies are using NVMe ICC testing not just for certification, but as a strategic tool for benchmarking and internal quality assurance.
4. Future of NVMe depends on collaboration of all members, partners, and stakeholders...so let's work together!





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**Thank You for Attending!**

**Q&A**