Medusa Labs Training

NVMe Protocol (ML750_NVMe3.0.2015.01)

Investigate the inner workings of the NVMe protocol, the latest storage access protocol designed for high-speed solid-state disks (SSD).

Get concrete, detailed answers to your questions:

- What PCIe requirements are needed to run NVMe?
- How are QoS and flow control implemented in NVMe?
- What command set is used for NVMe devices?
- What are submission and completion queues and how are they used in NVMe?

Learn these things and more in Medusa Lab's comprehensive NVMe Protocol training.

Based on the latest PCIe and NVMe specifications as well as real world test findings from Medusa Labs Testing Services, our NVMe protocol training covers the NVMe architecture from queue creation to command IO. Additionally, every Medusa Labs protocol class includes lab time involving trace analysis of the protocol.

Our classes are designed for engineering-minded individuals such as test engineers, design engineers, technical product/field support, and storage/system administrators who address low-level protocol issues

3 Day Course Outline

- Introduction to NVMe
- Components and Terminology
- PCI and PCIe Basics
- NVMe

What to Expect

- Never pay extra to view trace captures
- Insight into the standard based on real-world testing experience
- Learn from experts with more than 20 years of experience in storage and networking

Medusa Labs Testing and Training

Viavi Solutions™ is a leading provider of testing and training services through its Medusa Labs offering that focuses on server, storage, and networking interfaces and protocols. Our engineers and trainers are experts in SAS, SCSI, RAID, iSCSI, SATA, SAS, FCoE, PCIe, and NVMe.

Our engineers helped develop some of the industry's key technologies and continue to have a vigorous passion for improving products and sharing their knowledge. This experience and enthusiasm translates into the highest quality testing and training services possible.

We further set ourselves apart by bringing the lab to the classroom through the use of Viavi Xgig® analyzers in every class.

Introduction to NVMe

This section introduces NVMe as a protocol as well as the specifications and organization that govern it. It also deals with the marketing aspects that drive NVMe in the current product landscape by addressing the following questions:

- What is NVMe?
- Why do we need NVMe?
- What is the governing organization?
- What are the relevant specifications and where can they be found?

Components and Terminology

This section introduces the students to various concepts, terms, and devices that are integral to the understanding and functionality of PCIe and NVMe. Students will be given a vocabulary to effectively communicate ideas throughout the learning process by exploring such concepts as:

- - Differential signaling
- - Lanes vs. links
- - Switches and bridges
- - Scrambling
- - ACK and NAK
- Quality of service
- Encoding

PCI and PCIe Basics

This section provides students with background and practical information surrounding the underlying protocols on which NVMe sits: PCIe and PCI. While not intended to be an in-depth course in PCI/PCIe, students will acquire a functional overview of the protocol by examining such topics as:

- - PCIe Requirements for NVMe
- - PCIe Topology and Architecture
- - The layers of PCIe communication
- - Link Initialization and Signal Training
- - Flow Control and Quality of Service
- - PCIe Error Detection/Handling

NVMe

This section deals directly with the flows, processes, and entities that make up NVMe communication. It is a comprehensive study that gives students the knowledge and skills to analyze and assess NVMe devices and interactions. Students will explore the inner workings of the protocol by discussing subjects such as:

- - NVMe Topology and Architecture
- - Submission and Completion Queues
- - Admin and I/O Queues
- - Controller Capabilities Registers
- - NVMe Admin and I/O Commands

Xgig Analyzers

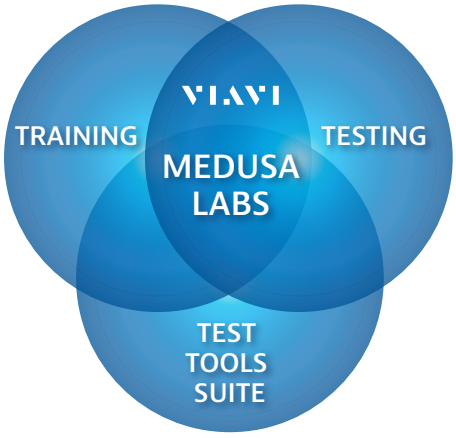
We recognize the importance of using test analysis equipment in the classroom. Today, we insist that not only the instructor but also the students use analyzer software during class. We believe there is no better way to reinforce the concepts discussed in a lecture than by "seeing" them in a trace capture. Using the Xgig analyzer, we'll show you how the protocol works. Whether onsite at your location, or at one of our own facilities, every core training course includes lab time.

Medusa Labs Testing Services

We test customers' products quickly and thoroughly in an enterprise environment to ensure that products will survive the rigorous demands of mission-critical applications. Customers come to us for our fast turnaround, superior analysis, excellent results, competitive prices, and, of course, 100% confidentiality. We work hand-in-hand with our customers' engineers to provide solutions, not just information. We provide not only the results of our tests, but also the debug, analysis, and regression testing that is needed to ensure that the products we test perform as expected—not for our customers, but for your customers.

Medusa Labs Test Tool Suite

We bring years of hands-on expertise and knowledge in the test and validation arena and put it directly into the Medusa Labs Test Tool Suite. The tools are specifically designed to find elusive data corruptions, I/O timeouts, I/O loss, system lockup scenarios, and data integrity susceptibility. They are rich in debug and logging information to allow for rapid analysis of any found issues. They are designed to stress hardware and signal integrity and function on Linux, Solaris, and Windows so that familiarity on one platform leads to familiarity on all others. The suite was designed specifically for engineers that work with DVT, validation, bring-up, design validation, and quality assurance.



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