

NVMe* Compliance Test Resources

David Woolf, University of New Hampshire InterOperability Laboratory Sarika Mehta, Validation Lead, Intel Corporation



IOL INTERACT tool

- David Woolf UNH-IOL
- NVMe Compliance Test Suite
 - Sarika Mehta Intel





- 1. Overview of NVMe Test Program and IOL INTERACT Test Tool
- 2. Requirements for using IOL INTERACT
- 3. Installation and Use of IOL INTERACT





 Since 2012 NVMe Promoters Group collaborating with UNH-IOL to create a Test Program for NVMe.







Flash Memory 1. Overview of NVMe* Test Program

Program has 4 Key Elements

- Test Services ------
- https://www.iol.unh.edu/services/testing/NVMe/
- Plugfests ------
- https://www.iol.unh.edu/services/testing/NVMe/plugfestfaq.php
- Test Tools -
- https://www.iol.unh.edu/services/testing/NVMe/tools.php
- Integrators List ------
- https://www.iol.unh.edu/services/testing/NVMe/integratorslist.php



1. Overview of NVMe* Test Program

- NVMe Promoters Group
 - Provides guidance on services, tools, plugfests, Integrators List qualification requirements



- iol UNH-IOL
 - Executes test services and plugfests, administers Integrators List, and develops test tools





1. Overview of NVMe* Test Program

- Key Test Tool Developed by UNH-IOL is IOL INTERACT
- Purpose of IOL INTERACT
 - Quickly and easily verify that an SSD meets the conformance requirements for the NVMe Integrators List
 - Not a rigorous performance test
- Sits on top of tNVMe compliance software





2. Requirements for using IOL INTERACT NVMe* Test Software

- tNVMe
 - Installed automatically by IOL INTERACT installer
- PC with Intel Chipset, running Ubuntu 10.10 64 bit.
 - Support for more modern OS to be addressed through tNVMe updates





2. Requirements for using IOL INTERACT NVMe* Test Software

- PCIe storage device
 - Any form factor that can connect to the Host System (CEM, SFF-8639 etc...)
- Membership in UNH-IOL NVMe Consortium
 - Grants license for IOL INTERACT, allows you to pre-check compliance for NVMe IL
 - UNH-IOL offers NVMe and PCIe conformance and interop testing
 - <u>https://www.iol.unh.edu/services/membership/form/</u>





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	The expiration date for the license is xx xx, xxxx, when the IOL- Interact is run it will display the days remaining. IOL- Interact will renew if you purchase membership with the IOL, in that case we will just email you with a new license file.				
	This is version v1.01 of the GUI and you will receive fixes and updates as we make them, if you need any support contact numelab@iol.unh.edu. Its our first version and we're expecting bugs. We want as much feedback as possible.				
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	Jeffrey Masucci				
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Receive email with IOL INTERACT download link





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Download the jar file



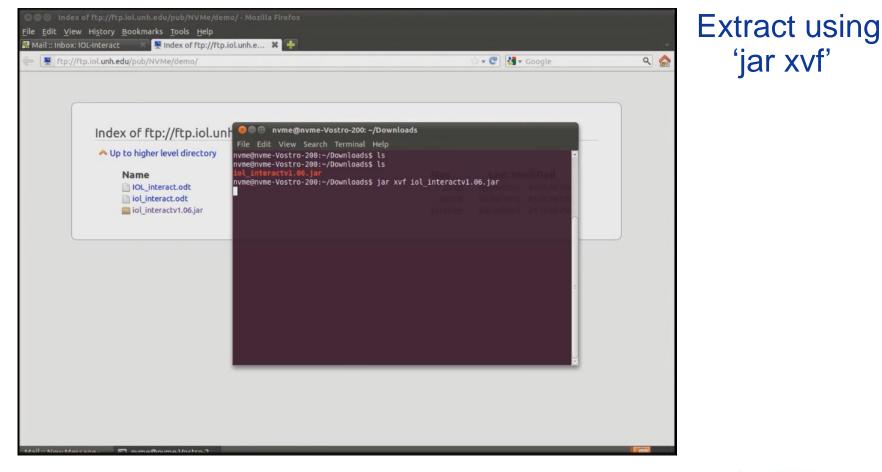


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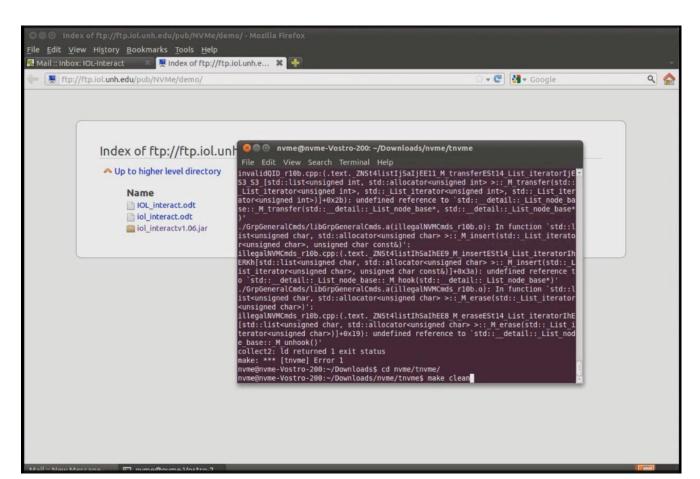


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	linux-headers-2.6.35-22-generic Use 'apt-get autoremove' to remove them.
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	libboost1.42-all-dev is already the newest version.

'sh install.sh'



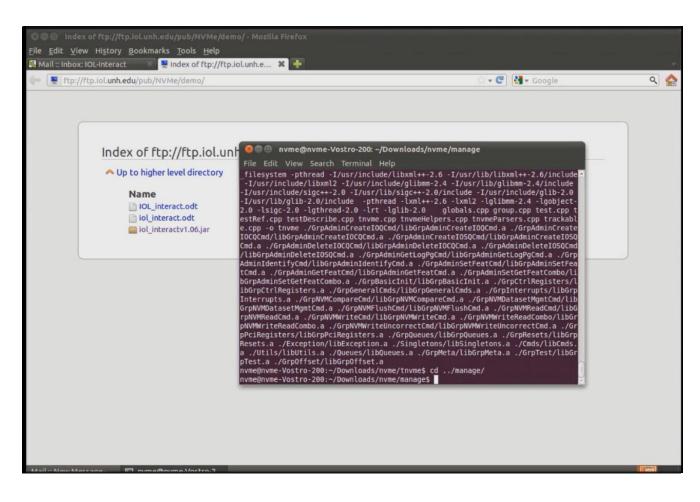




If a make error occurs for tnvme, run 'make clean' followed by 'make'. This will take a minute or so







Change directories to /nvme/mana ge





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Change permissions for runtnvme.sh with 'chmod 777 runtnvme.sh'





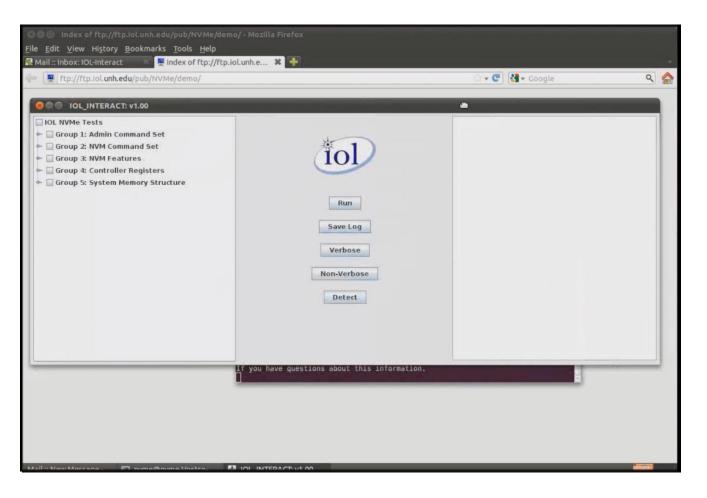
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Start IOL INTERACT with 'sh installnrunG UI.sh'

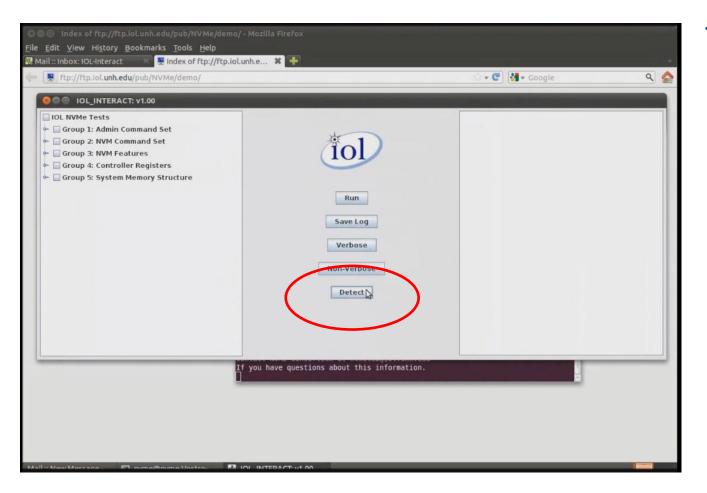
You will see a license message and a UNH-IOL contact email











The software will open. Use the 'detect' button to detect any attached NVMe devices.

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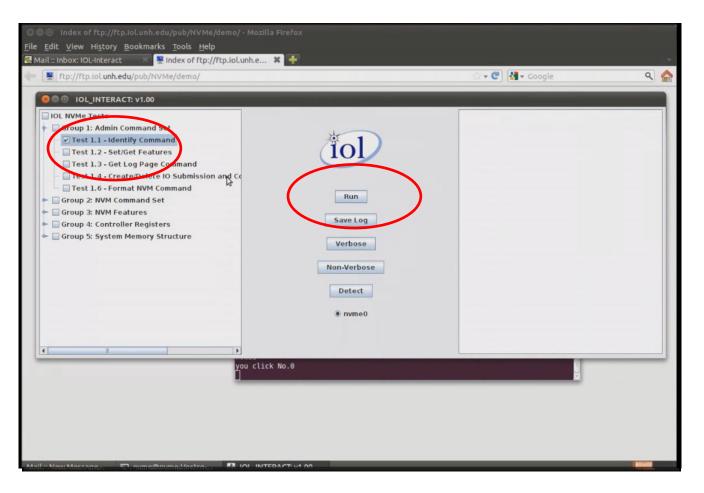


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Select the radio button for NVMe device to test. The device must appear in /mnt/nvme

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Select tests to run on the left, then click Run.





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- IOL INTERACT software sits on top of NVMe compliance test suite software.
- NVMe compliance test suite to be discussed next.





IOL INTERACT* tool

- David Woolf UNH-IOL*
- NVMe Compliance Test Suite
 - Sarika Mehta Intel





Overview

- High-level Introduction
- Usage
- Community Participation





NVMe* Compliance Test Suite

Introduction

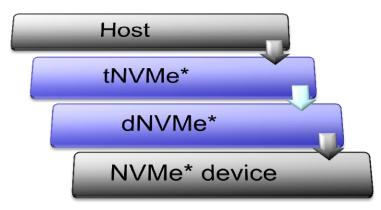
- Open source
- 64-bit Linux* based, user space software test infrastructure
- Helps validate device compliance with the NVMe* specification
- Currently supports NVMe* spec revision 1.0





Test Suite Components

- tNVMe* Compliance test suite application
 - User level interface
 - Weaves functionality provided by kernel into tests
- dNVMe* Linux driver for the compliance test suite
 - Exposes an interface to kernel functionality





28



Hardware for Test Execution

- Real physical hardware
- Simulated hardware

Test execution with ease of debug

- Zero Dependency
 - Standalone tests
- Configuration Dependency
 - Test depending on prior configuration
- Sequence Dependency
 - Multiple tests depending on prior tests



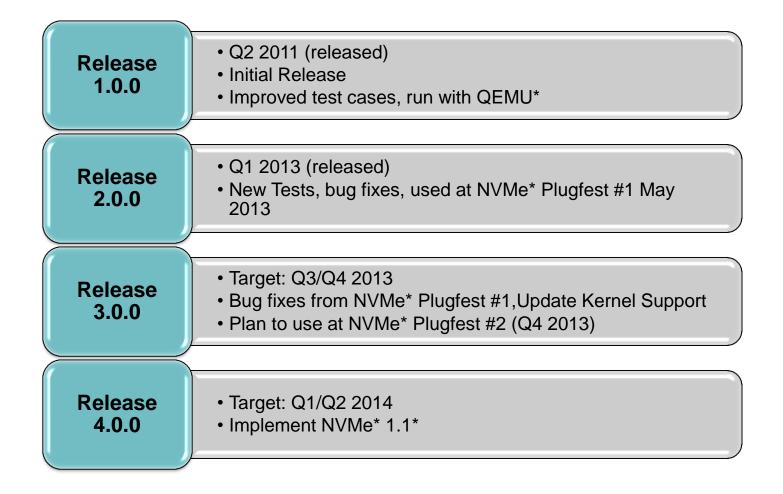


- Use tNVMe* as is with quick scripting
- Custom debug/validation framework wrapper





NVMe Compliance Test Suite Planned Roadmap



Flash Memory



Call to Action - Participate

- UNH-IOL* administers code contributions via Github*
- Software release: <u>https://github.com/nvmecompliance</u>
- Architecture, compiling, executing, and contribution details: <u>https://github.com/nvmecompliance/tnvme/wiki</u>
- NVMe* device simulation: <u>https://github.com/nvmeqemu</u>
- Contact: compliance@nvmexpress.org





Links and Resources

- 1. tNVMe* wiki: https://github.com/nvmecompliance/tnvme/wiki
- 2. Software release: <u>https://github.com/nvmecompliance</u>
- 3. Test plan and test cases: <u>https://github.com/nvmecompliance/tnvme/blob/master/Doc/testPlan.ods</u>.
- 4. Designing test dependencies: <u>https://github.com/nvmecompliance/tnvme/blob/master/Doc/testDependencyPreso.pdf</u>
- 5. Code sample for wrapper: <u>https://github.com/nvmecompliance/manage/blob/master/regression.sh</u>
- 6. Support: compliance@nvmexpress.org



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