How to ensure Advanced Host Controller Interface (AHCI) conformance

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Levels of Conformance

- Device Bring Up

- Protocol Conformance

- Performance

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Device Bring Up

- PCIe Information
- AHCI Register Access
- Directed Tests
    - Ensure bios and driver can initialize device
    - Register validation

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Protocol Conformance

- Directed Tests
  - AHCI
  - SATA
- Error Injection
  - Protocol level errors
  - Low level errors
- Traffic
- Data Validation

Protocol Conformance - Directed Tests

- AHCI and SATA

Protocol Conformance - Error Injection

- Protocol level errors
  - Malformed Commands
  - Protocol Resets
- Low level errors
  - Power Loss/Recovery
  - PCIe Resets

Protocol Conformance - Traffic

- Everything at once
  - Maximum queue depth
  - Simultaneous mixed commands
  - Mixed mode (FPDMA and non-FPDMA)
  - Error Injection
 - Power Loss/Recovery

Protocol Conformance - Data Validation

- Verification of existing data after resets and power fails
- Verification of writes leading up to resets/power fails
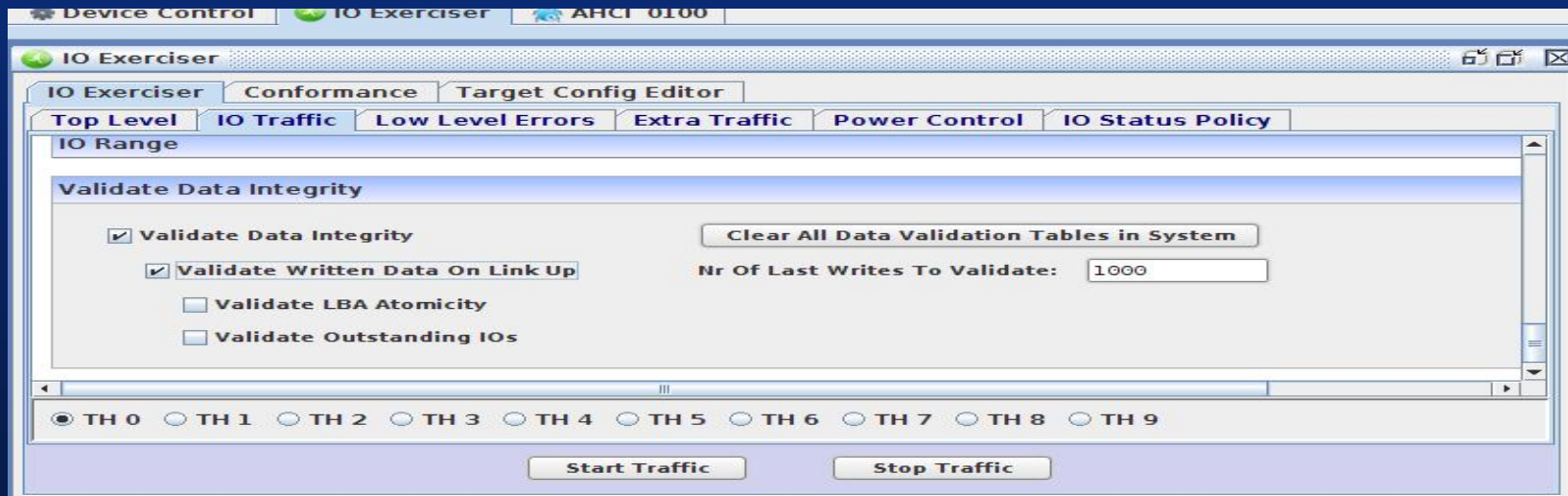
Performance

- Custom drivers allow truly consistent and repeatable performance measurements
- Industry Leading Performance
  - Achieved greater than 1.3 million IOPS per core
- Deep Analytics
- Power
  - Power versus Po

Average Read Latency

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Automation
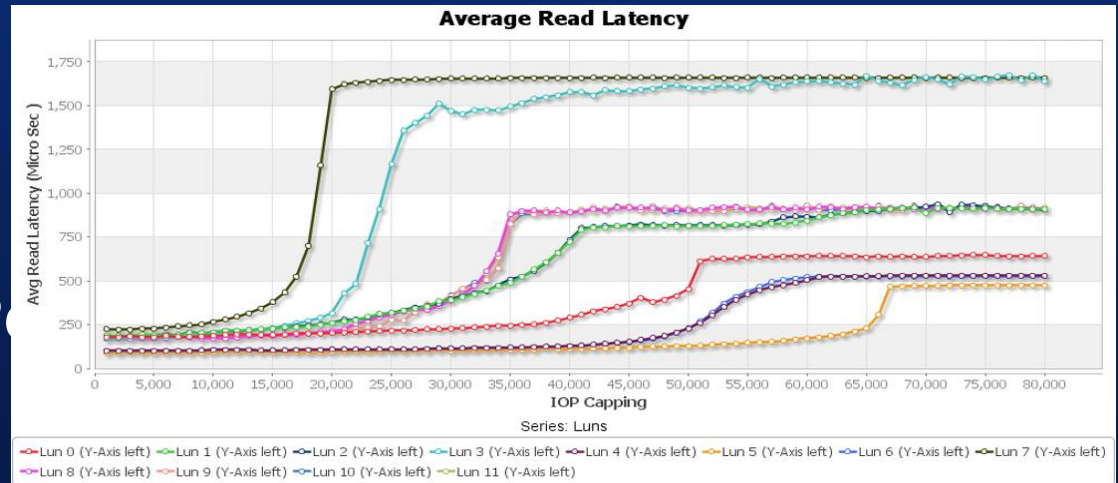
- **Provides a Test Suite for consistent repeatable testing mechanism**
  - Initial conditions
  - Vary test parameters
  - Graphing
  - Report Generation
    - HTML
    - CSV
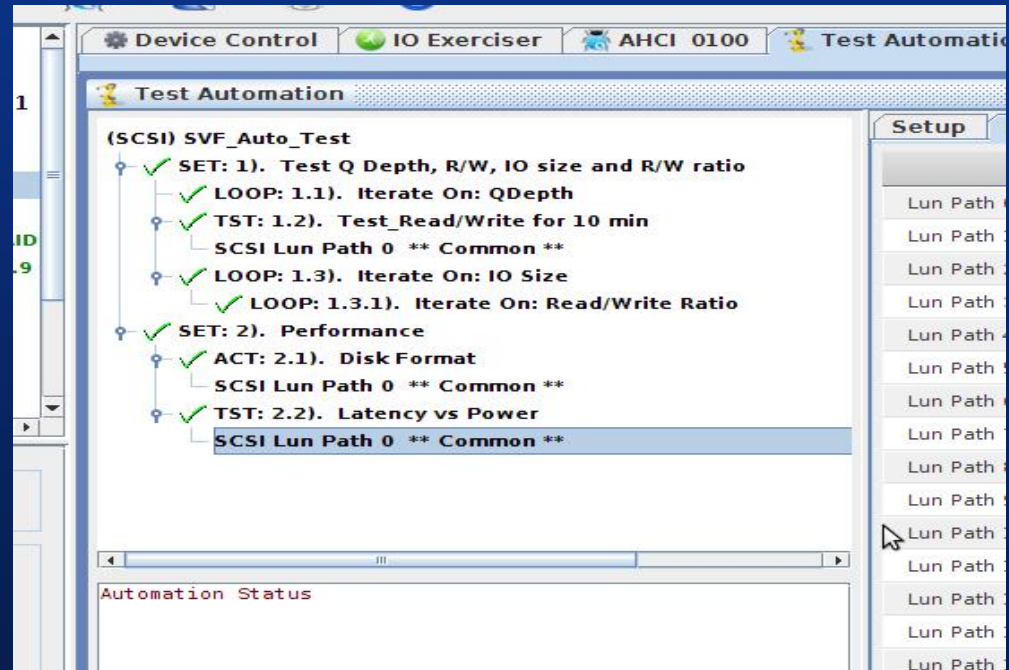
Summary

- Advanced toolset to verify conformance through all phases of development

- OakGate AHCI Conformance Suite, developed in partnership with customers, can serve as a useful vehicle to ensure compliance with the AHCI standard