OakGate Endeavor CXL Validation Software

Powering the Industry-First OakGate CXL Validation Appliances

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Endeavor is the industry's first-of-its-kind CXL memory device validation software and is at the core of the integrated software applications that power the OakGate CXL Validation Appliances.

KEY FEATURES

Complete Validation Capabilities

- Support for PCIe 5.0 Type 3 CXL 1.1, 2.0 and 3.x Memory Devices
- Ability to test up to eight (8) Type 3 CEM or E3.S CXL devices under test (DUTs) concurrently
- Traffic generation to easily generate common memory traffic profiles
- Register editing to read and write PCIe registers
- Memory Interleaving
- Built-in security flows utilizing SPDM over DOE, SMBus and PCIe VDM
- Voltage margining and power control to power devices on and off
- Sideband control of PERST# and PWRDIS
- Interface to send passthrough commands
- Built-in automation
- Python application programming interface (API) to control all the commands using Python
- Additionally, the CXL.org CV compliance tests can be run directly from Endeavor

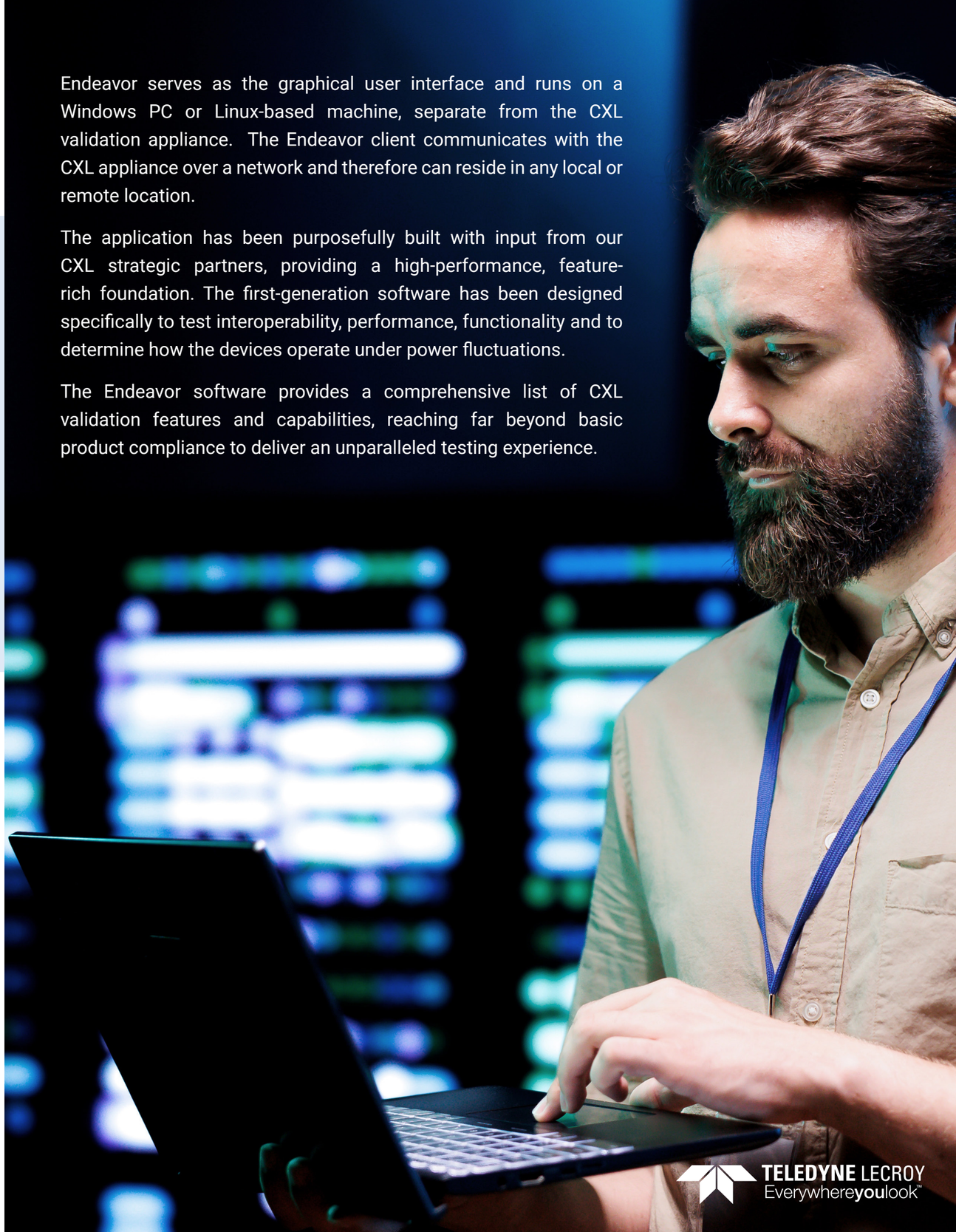
OakGate Endeavor
The user Windows PC or Linux-based machine with OakGate Endeavor application installed.

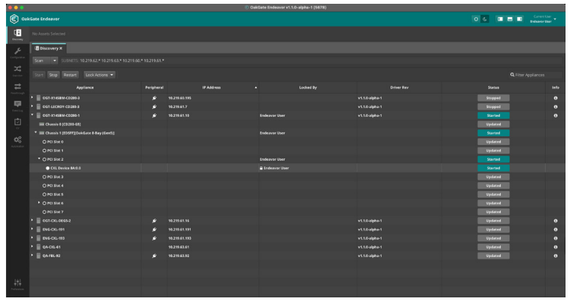
OakGate CXL Appliance
An OakGate Linux-based desktop appliance with the OakGate CXL Validation Software and CEM module installed.

Endeavor serves as the graphical user interface and runs on a Windows PC or Linux-based machine, separate from the CXL validation appliance. The Endeavor client communicates with the CXL appliance over a network and therefore can reside in any local or remote location.

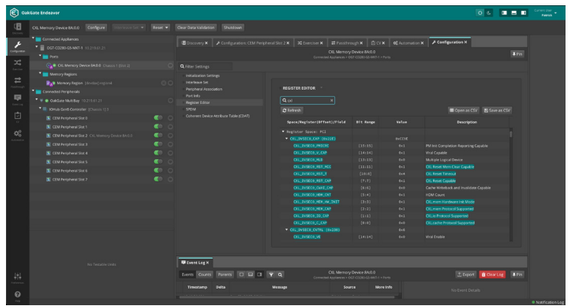
The application has been purposefully built with input from our CXL strategic partners, providing a high-performance, feature-rich foundation. The first-generation software has been designed specifically to test interoperability, performance, functionality and to determine how the devices operate under power fluctuations.

The Endeavor software provides a comprehensive list of CXL validation features and capabilities, reaching far beyond basic product compliance to deliver an unparalleled testing experience.

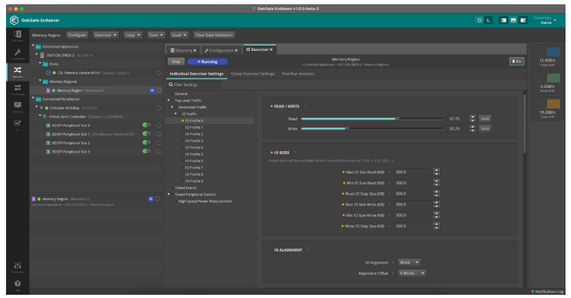




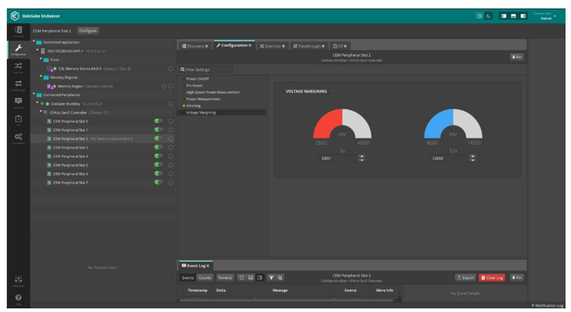
The **Discovered Appliances** tool includes controls to discover and start an appliance, as well as update the software on the remote OakGate test appliance. It also provides a method for associating peripherals and controlling power for hot swapping.



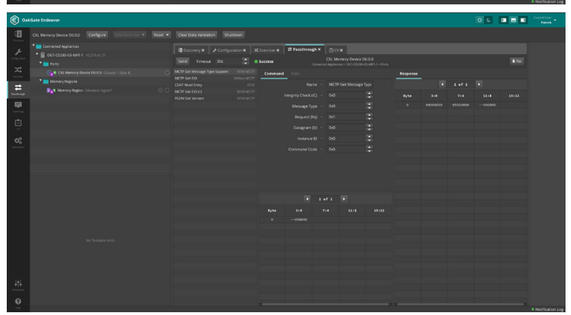
The **Register Editor** tool includes ability to read and write PCI Registers and filter or search Registers. User can export these settings to a CSV file.



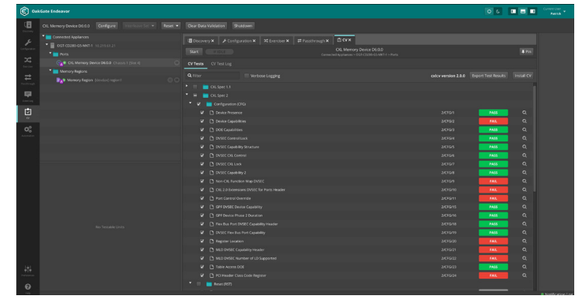
The **Exerciser** tool is used to uniquely configure and run memory I/O traffic. The exerciser includes numerous individual and global settings to configure and run memory I/O traffic and tests on a selected CXL memory device. The exerciser is able to run high speed IO while guaranteeing data integrity via data validation.



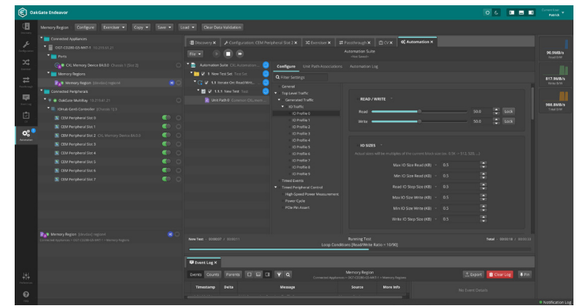
The **Power Management** tool allows users to power the memory device on and off and toggle the sideband signals on the device. Includes supports for voltage margining. Additionally, includes support for high-speed power sampling (250 KHz). Users can plot power measurements.



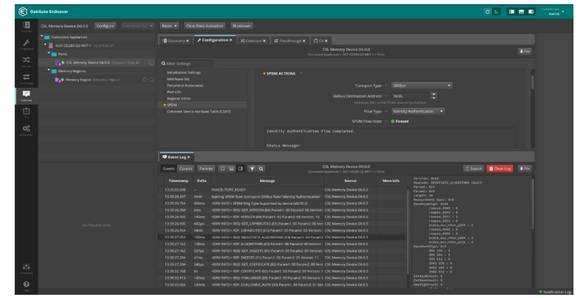
A **Passthrough** tool runs commands sent to the target device with the expectation that the target device returns specific responses. Passthrough protocols include SMBus, SMBus MCTP, VDM MCTP and DOE. Users can also transmit and receive CXL CCI commands via Mailbox Registers.



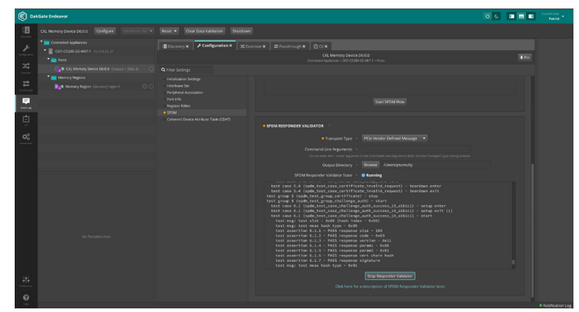
The **CV Compliance Test** tool provides a means to integrate and run the Compute Express Link (CXL) compliance verification tests from Endeavor on selected target devices.



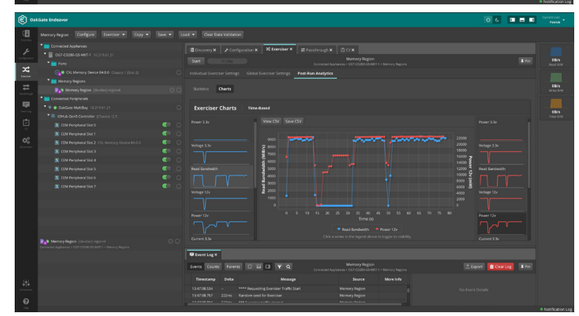
The **Automation** tool runs an automation suite, which consists of one or more test sets. A test set can include multiple tests, actions, and loops. Each of the individual tests can run with configured Exerciser settings. The automation suite runs in a predetermined order without user intervention.



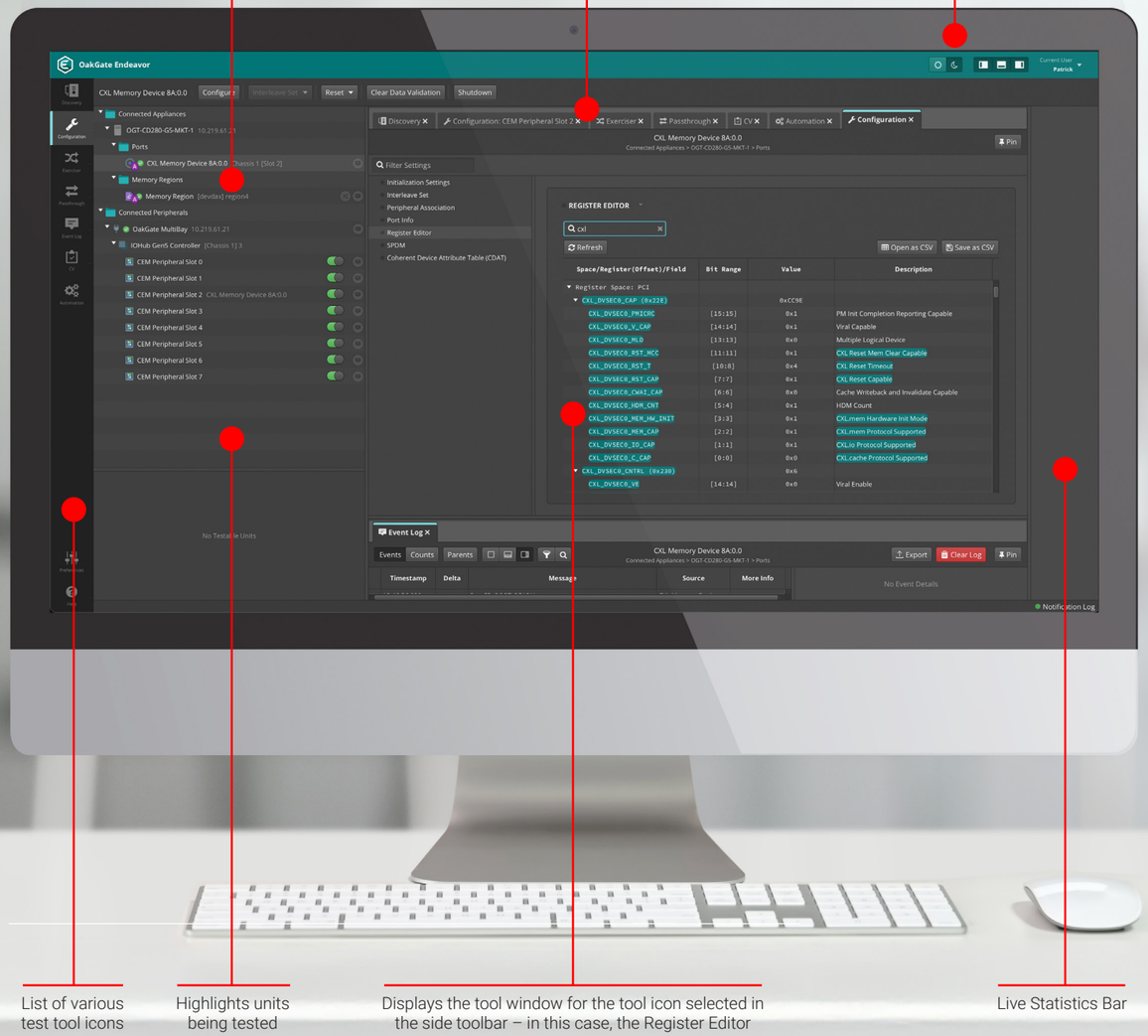
The **Security Protocol and Data Model (SPDM)** tool lets users execute built-in security flows utilizing Security Protocols and Data Models (SPDM). Current support for SPDM transport layers SMBus/I2C and PCIe VDM.



The **SPDM Responder Validator** tool is an open-source test suite that leverages OakGate's proprietary hardware to validate conformance to the SPDM specification over SMBus MCTP and VDM MCTP.



The **Post Run Analytics** tool statistics include the total test duration, I/Os completed, data transferred, average IOPs, average bandwidth, and so on. The timed-based charts include average IOPs, and average bandwidth.



All Your CXL Validation Tools Integrated with Powerful Windowing System

The OakGate CXL Validation Endeavor Software is built around four core validation principals.

- **Ensure Device Interoperability**
  Test the memory device interoperability in our complete, dedicated test system environment to evaluate their behavior in a broader context and under realistic conditions.
- **Confirm Device Functionality**
  Perform functional testing to ensure that the memory devices operate as intended. This includes validating various features, addressing modes, and error handling mechanisms.
- **Verify Device Performance**
  Conduct performance testing to assess the speed and bandwidth of the Type 3 CXL Memory Devices. This helps in understanding how well the devices perform under different workloads and scenarios.
- **Ensure Device Operates Correctly Under Power**
  Test and validate the power consumption characteristics of the Type 3 CXL Memory Devices to ensure they meet specified power requirements and are energy efficient.

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SOFTWARE FEATURES

Discovery

- View CXL devices that currently appear on the PCI bus.
- Set IP subnets and scan for the system.
- User-based device locking (with status)

Configuration

- Configure CXL devices
- Display CXL devices under test
- Support for Memory Interleaving
- Multi-monitor support
- Switch to light or dark modes

Register Editor

- Read and Write PCI Registers
- Filter and Search Registers
- Export to CSV

Traffic Generation

- Easily generate common memory traffic profiles (reads/writes)
- Validate and verify data (data validation)
- Includes post-run analytics for bandwidth read, write, total and power

Passthrough Commands

- Simple Interface for sending protocol-specific commands
- Save and Load Commands
- Construct commands via decoded command view settings or modify the command bytes directly
- Currently supports Data Object Exchange (DOE), SMBus MCTP, VDM MCTP and Memory passthrough
- Mailbox CCI commands

Peripheral Control and Power Management

- Voltage margining
- Power control and glitching
- Hot-plug support
- Sideband PERST0#, CLKREQ#, HPT1, DUALPORTEN#, PWRDIS, WAKE#, SMBRST# control and glitching
- High-speed power sampling (250 KHz) and statistics

Python Application Programming Interface

- Built-in Automation
- Control the Endeavor via Python API. Each Endeavor application instance automatically starts its own REST server

Security

- Execute built-in security flows utilizing Security Protocols and Data Models (SPDM)
- Support for SPDM transport layers SMBus/I2C, PCIe VDM & DOE
- Security passthrough feature with APIs that allow users to script test cases for SPDM, IDE, DOE

CXL Compliance Verification (CV) Test Suite

- Launch and run CXL.org CV Compliance Tests from the Endeavor Software Application
- Security transport APIs to allow for test creation
- Available for CXL.org Member Companies only

Ordering Information

Product Description	Product Code
OakGate Gen5 CD280 CXL Validation Desktop Appliance	OGT-CD280-G5
Compatible CM-Series Modules for CXL Devices	
Supports up to eight (8) Add-In Card (AIC) CXL Devices	OGT-CXL-MCEM-800-G5
Supports up to eight (8) EDSFF E3 CXL Devices	OGT-CXL-ME3-800-G5

For more information,
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