BROADCOM®

Product Brief

OneCore™ Storage Software Development Kit (SDK)

Key Features

- A single monolithic structure that contains reference drivers for Target-mode, Initiator-mode, and concurrent Initiator and Target-modes
- One development platform that satisfies all storage protocols (FC, FCoE, iSCSI)
- Operating system (OS) agnostic—equally scalable into Linux and FreeBSD environments
- FreeBSD & Linux OS driver source code
- Modular Architecture
- NPIV port-virtualization
- T10-PI Advanced Data Integrity
- Browser-based driver development documentation
- Online training and support
- Community support user forums

Key Benefits

- Accelerated solution time-to-market using leading FC adapters
- Design flexibility to support developer's driver framework
- Dynamic and flexible deployment capabilities
- Immediate product availability and support
- Broad platform support
- Easy to understand reference driver utilities

Comprehensive, extensible, modular framework and architecture

Delivering Accelerated, Simplified and Enhanced Driver Development Tools for Unrivaled Storage Networking Performance

Overview

Emulex® branded HBAs by Broadcom deliver leading Fibre Channel (FC) technology for the storage network market—the innovation and performance standard bearer for 10 generations of product development. With more than 12 million ports shipped worldwide, our technology is trusted to power the largest and most demanding data centers, delivering the performance and reliability that have become synonymous with Emulex HBAs.

With the OneCore Storage SDK, we've redesigned our driver and support system from the ground up in an effort to simplify and accelerate the process of developing storage solutions to meet the dynamic needs of the storage array, and storage appliance markets that require enterprise-class, high bandwidth and low latency I/O connectivity.

The OneCore Storage driver architecture provides design flexibility, enabling selective use of modular layers to meet customer-specific requirements and architectural needs. To aid in development efforts, we've created HTML-based driver development documentation, online training and support documents, and a community forum to collaborate with our engineering team. The OneCore Storage SDK is a feature-rich driver development framework supporting SAN innovations such as N_Port Identification Virtualization (NPIV), which allows users to maintain SAN best practices within a virtualized environment, and T10 Protection Information (T10-PI), providing enhanced data protection against silent data corruption.

OneCore Storage Driver Architecture

Service Level Interface (SLI)-4 Module—An evolutionary refresh of the Emulex SLI. SLI-4 expands beyond FC support to include all the protocols offered in our latest generation of products including iSCSI, Fibre Channel over Ethernet (FCoE).

The SLI for the OneCore Storage driver provides a lightly abstracted application programming interface (API) that enables access to SLI-4 hardware devices. It includes APIs to create the queues necessary to communicate to the SLI-4 hardware, as well as APIs that construct SLI-4 commands and parse responses.

Hardware Abstraction Layer (HAL) Module—Provides an abstracted interface to the SLI module layer enabling common operations such as port initialization, shutdown and I/O. These operations can be performed without having to know the semantics of the SLI-4 interface. The HAL provides APIs for port and node management, command and event processing, as well as I/O handling.

Transport Module—Is composed of three sub-modules: FC/FCoE transport, iSCSI transport, and a SCSI API. These sub-modules provide protocol-specific and generic transport handling. The FC/FCoE transport sub-module includes discovery, login and Basic Link Services (BLS)/ Extended Link Services (ELS) handling that is unique to FC/FCoE storage networks. The iSCSI transport sub-module includes iSCSIspecific transport layer handling including connection establishment, connection offload and session management. The SCSI API sub-module provides a SCSI-like API for back-end initiator and target connectivity. This generic transport-layer interface is common across all three storage protocols (FC, FCoE and iSCSI). It includes APIs for sending/receiving SCSI commands and Task Management Functions (TMFs), sending/receiving data and SCSI status, as well as aborting I/O.

OS Module—Provides the OS services required by the OneCore Storage driver through an OS-independent API. A separate module is provided for Linux and FreeBSD in the OneCore Storage SDK. Functions supported include memory allocation, free, and cache coherency functions for both CPU and Direct Memory Access (DMA) memory types. They also include functions for locking for concurrency protection, linked list creation and handling, as well as OS-specific PCI driver entry points, Message Signaled Interrupt Extended (MSIx)/INTx interrupt handling, etc. This OS module is structured to allow modifications in the event an OEM wants to port the driver to a different OS.

Comprehensive, extensible, modular framework and architecture
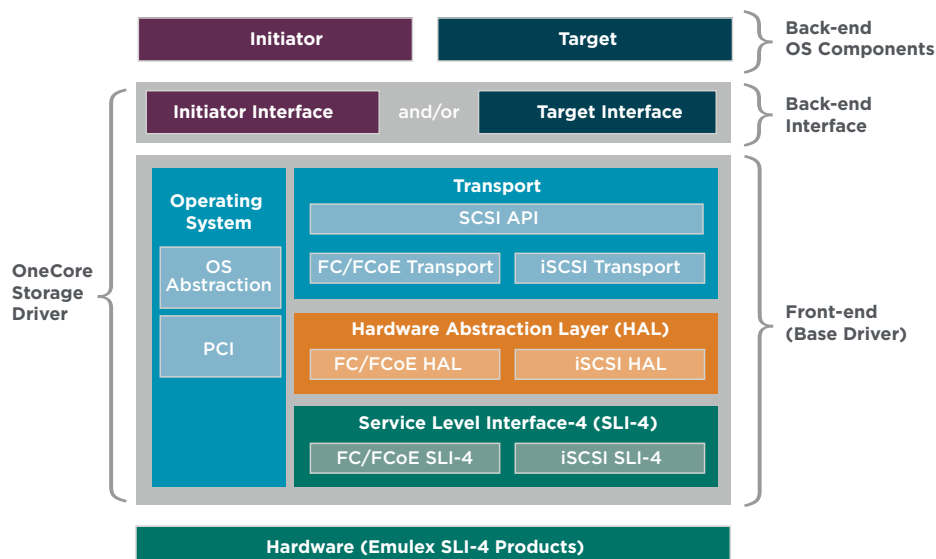
Operating System Support

• Red Hat Enterprise Linux

• FreeBSD

Multi-Protocol Support

• FC

• iSCSI (over 10GbE)

• FCoE

Ordering Information

Gen 5 FC (16GFC)

LPe16000B-M6
• 1 Port PCIe 3.0 16GFC Short Wave Optical - LC SFP+

LPe16002B-M6
• 2 Port PCIe 3.0 16GFC Short Wave Optical - LC SFP+

LPe16004-M6
• 4 Port PCIe 3.0 16GFC Short Wave Optical - LC SFP+

Gen 6 FC (16/32GFC)

LPe31000-M6
• 1 Port PCIe 3.0 16GFC Short Wave Optical – LC SFP+

LPe31002-M6 (upgradeable to 32GFC)
• 2 Ports PCIe 3.0 16GFC Short Wave Optical – LC SFP+

LPe31004-M6
• 4 Port PCIe 3.0 16GFC Short Wave Optical – LC SFF (embedded optics)

LPe31004-M6-SIO (upgradeable to 32GFC)
• 4 Port PCIe 3.0 16GFC Short Wave Optical- LC SFP+

LPe32000-M2
• 1 Port PCIe 3.0 32GFC Short Wave Optical – LC SFP+

LPe32002-M2
• 2 Port PCIe 3.0 32GFC Short Wave Optical – LC SFP+

LPe32004-M2-SIO
• 4 Port PCIe 3.0 32GFC Short Wave Optical- LC SFP+

Advanced-8 (8GFC)

LPe16000B-M8
• 1 Port PCIe 3.0 8GFC Short Wave Optical - LC SFP+

LPe16002B-M8
• 2 Port PCIe 3.0 8GFC Short Wave Optical - LC SFP+

LPe15004-M8
• 4 Port PCIe 3.0 8GFC Short Wave Optical - LC SFP+

Converged Fabric Adapter (10GbE, 16GFC, 8GFC)

LPe16202-X
• 2 Port PCIe 3.0 Short Wave Optical - LC SFP+ and DAC models available

Resources

SDK device driver source code and documentation
• Linux OneCore Storage FC/FCoE and iSCSI reference drivers
• FreeBSD OneCore Storage FC/FCoE reference drivers
• OneCore Storage Reference Driver Manual
• OneCore Storage SDK Quick Start Guide
• OneCore Storage SDK Release Notes

SDK Reference Utility code and documentation
• OneCore Storage SDK Utility Reference Guide

Comprehensive SLI-4 documentation
• SLI-4 Architecture Specification
• SLI-4 FC and FCoE Command Reference
• SLI-4 iSCSI Command Reference
• SLI-4 Adapter Management Commands