

## Emulex TargetConnect™™ Software Developer Kit (SDK)

### Product Launch

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## 1. What is the Emulex TargetConnect™ Software Developer Kit?

The Emulex TargetConnect™ Software Developer Kit (SDK) gives hardware and software solution providers the flexibility to develop and deploy storage solutions based on Emulex LightPulse® Fibre Channel and FCoE CNA target or initiator mode drivers

The SDK supports two development options: The Emulex Sample SCSI Target Mode Driver, which is for highly-tuned proprietary Linux applications; and the Emulex SCST Subsystem, which provides an Emulex SCST helper to transparently map the code to the Open Source SCST Subsystem.

## 2. How does the TargetConnect™ SDK leverage Emulex's HBA technology?

Companies are choosing to license the TargetConnect™ Software Developer Kit and build solutions around Emulex LightPulse® Fibre Channel HBAs and FCoE CNAs. Emulex's product line is based on eight generations of advanced, field-proven HBA technology for enterprise-class SANs.

The SDK offers unparalleled added-value:

- Provides a broad enterprise-class product line of 4Gb/s, 8Gb/s HBAs and 10Gb/s FCoE CNAs that are available in multiple form factors and supported across almost every model of rack-mount and blade servers.
- Decreases time-to-market for hardware and software developers with Linux-based SDK and technical documentation to be utilized by the customer in any embedded OS environment.
- Provides a world-class support infrastructure from Emulex to assist your company during the development phase.
- Enhances portability and provides driver compatibility across all generations of Emulex adaptors.

### 3. What is the underlying architecture of the Emulex target mode device driver?

Emulex offers two options for the basis of target mode driver development:

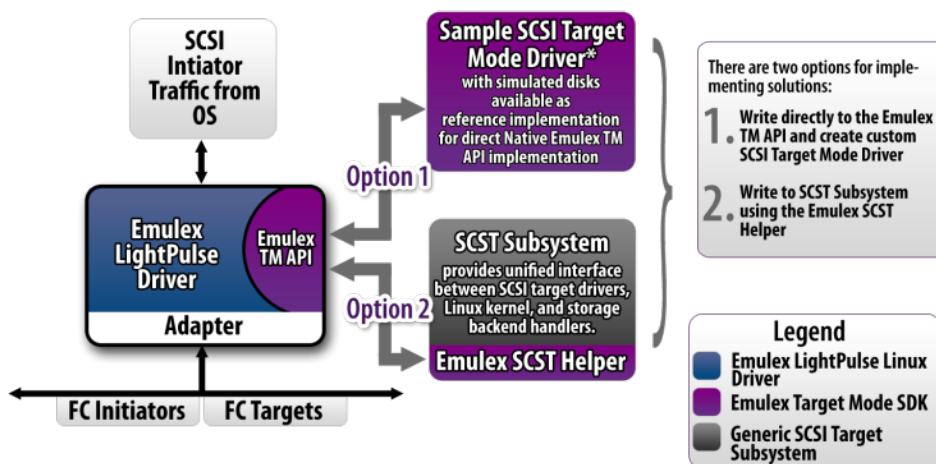
**The Sample SCSI Target Mode Driver for Proprietary Functionality:** This package includes an Emulex LightPulse® driver (Linux initiator base driver\*) delivered in source code form with an Emulex target mode API added to the base driver. Developers write directly to the Emulex target mode API and create a custom SCSI target mode driver in any environment, whether it be a custom OS or off-the-shelf OS. To guide the development of a custom driver, a sample SCSI target mode driver with simulated disks is provided. The complete kit is available with an Emulex software license agreement.

*\*the base driver is Linux Open Source (GPL).*

#### The Emulex SCST Subsystem for Open Source Functionality

For developers who want to leverage the open source community SCST architecture in designing Linux-based storage solutions, Emulex provides an Emulex SCST helper, which transparently maps the code to the OpenSource SCST Subsystem. This option is available as a free download from the Emulex website or from [www.SourceForge.net](http://www.SourceForge.net).

## Emulex TargetConnect™ Linux Software Developer Kit



\* Developer may optionally replace/modify the sample driver (which is a reference) with custom driver code.

#### 4. Why would I choose to use the Sample SCSI Target Mode Driver vs. the SCST Subsystem?

The Emulex Sample SCSI Target Mode Driver provides more control to develop an infrastructure for a target mode application at a low level-maintained API, with greater design customization to achieve better performance and proprietary functionality.

SCST is an Open Source standard developed by the Linux community, and is an alternative implementation of a SCSI target subsystem for Linux. It provides a unified, consistent interface between SCSI target drivers and the Linux kernel as well as between the Linux kernel and storage backend handlers. This infrastructure provides faster time-to-market with extensive device support.

#### 5. What is included in the Emulex TargetConnect™ SDK Package?

After signing the Software Developer Kit License Agreement<sup>1</sup>, customers receive the following:

- Linux source code to an Emulex Linux target mode driver
- Two Emulex LPe12002 dual-channel 8Gb/s Fibre Channel HBAs
- Documentation for the target mode API
- Two days of engineering training at Emulex headquarters in Costa Mesa, CA
- One year of Emulex dedicated technical support

#### 6. What is the cost of the Emulex TargetConnect™ SDK?

The Emulex TargetConnect™ SDK package retails for \$5,000.

#### 7. What version of Linux does the TargetConnect™ SDK support?

- The Emulex Sample SCSI Target Mode Driver is supported and tested with RHEL 5.x and SLES 10.x.
- The Emulex SCST Subsystem is supported and tested with Linux 2.6.18, and SCST version 1.0.1.

#### 8. Does the Emulex TargetConnect™ SDK support Linux SCST Drivers for 8Gb HBAs?

Yes. Emulex is actively involved in development efforts within the Open Source community and extending the reach of Linux target applications.

The Emulex SDK supports SCST drivers for 4 and 8Gb/s HBAs, as well as 10Gb/s CNAs. QLogic's SDK does not support SCST drivers faster than 2Gb.

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<sup>1</sup> Customers can opt to download source for the driver (from [www.Emulex.com](http://www.Emulex.com) or [www.SourceForge.net](http://www.SourceForge.net)) without signing an Emulex License Agreement, however, if this option is chosen, they will not receive documentation, product samples, training, and ongoing technical support

**9. What is SCST and why is it important to my company?**

The SCSI target subsystem for Linux (SCST) is an Open Source standard developed by the Linux community, and helps developers to leverage Linux and low-cost Intel hardware thereby simplifying their target driver development. SCST enables the creation of sophisticated storage devices, which provide advanced functionality, including replication, thin provisioning, deduplication, high availability, and automatic backup.

**10. Is Emulex willing to incorporate changes into the Emulex Open Source driver that are made by our company?**

Yes. Emulex will evaluate all changes submitted by our customers. If the changes are accepted, they will be incorporated and distributed as part of the Emulex Open Source driver.

**11. What are some of the advantages of using the Emulex SDK compared to the QLogic SDK?**

- Emulex provides a choice of two driver options for either proprietary target mode solutions or Open Source products using the SCST infrastructure.
- Emulex drivers have undergone Emulex enterprise-class Device Validation Testing (DVT) to ensure robust reliability. This is the same testing standard used by world-class OEMs like IBM, HP, and EMC.
- Emulex supports SCST with 4, and 8 Gb/s HBAs as well as FCoE-based connectivity.
- Emulex drivers enable both initiator as well as target mode devices.
- The drivers are compatible with Emulex SLI3 (Service Level Interface) technology enabling single-driver support for Emulex LightPulse® 4 and 8Gb/s HBS, and 10Gb/s CNAs in addition to FCoE-based connectivity
- Emulex provides greater reliability with MTBF of 10 million hours and over 7 million ports installed.
- Emulex provides high performance features such as Host Buffer Queue (HBQ) to allow the target driver to customize the application's buffer handling and Interrupt Coalescing to improve CPU-offload.
- FCP-3 Tape Target Error Recovery Protocol support for tape and virtual tape applications.
- Emulex provides technical training plus one year of developer support.

**12. What is the benefit of Device Validation Testing (DVT) on the SDK?**

Because the Emulex SDK has undergone DVT testing, storage solution vendors using the Emulex SDK know that the base drivers have run through a suite of interoperability testing designed to ensure compatibility with storage, servers, switches and software used throughout the industry.

Emulex has established one of the industry's finest interoperability labs, with thousands of pieces of storage devices, servers, software and test equipment configured with leading operating systems



and middleware applications. Every year, Emulex continues to invest millions of dollars in new equipment for the labs to simulate the latest IT infrastructures used by enterprise customers.

Emulex products are tested in hundreds of common customer configurations. To simulate enterprise environments, Emulex uses OEM partner as well as third-party hardware and system, storage and application software. Robust test suites include vast numbers of functional, stress and regression test cases, run on multiple generations of firmware, software and hardware configurations. Reliability and interoperability testing continues into production, where Emulex runs a 24-hour stress and functionality test on each adapter before shipping it to a customer. Emulex rigorous quality assurance, both in design and production, ensures high availability for storage solutions using Emulex adapters.

### **13. How much performance can I expect from the Emulex target mode driver?**

Performance will vary by implementation, but typical performance is between 70% and 90% of the performance achieved in standard initiator mode.

Third I/O, a developer of high-speed storage systems, has documented performance of over 1 million I/O's per second (IOPs) achieved by using Emulex Fibre Channel HBAs in both initiator and target mode.

"We recorded 1,122,742 and 1,088,976 IOPS on 512 byte and 1 KB I/O sizes respectively. To the best of our knowledge, this is the first time that 1 million IOPS have ever been observed on a Fibre Channel platform," said Mark Lanteigne, founder and chief technical strategist for Third I/O. (Refer to [www.thirdio.com/1million.pdf](http://www.thirdio.com/1million.pdf) to read the entire Third I/O Performance Brief.)

### **14. Does the Emulex TargetConnect™ SDK work with NPIV?**

Yes. The Emulex TargetConnect™ SDK fully supports N\_Port ID Virtualization (NPIV).

### **15. What are the benefits of NPIV for developing solutions based on the Emulex target mode driver?**

NPIV is an ANSI T11 standard that describes how a single Fibre Channel HBA port can register several worldwide port names (WWPNs). This standard is used to create multiple virtual data paths (VPorts) through one physical HBA port. Solution developers can use these VPorts to implement virtual channels with specific applications, such as one Vport for failover and a second for enhanced storage management features.

### **16. How does the Emulex SDK help my company create Linux-based storage solutions?**

The TargetConnect™ SDK provides a time-to-market shortcut for developing feature-rich Linux-based target mode applications. The SDK offers Linux solutions developers with extensive advantages, including:

- More control to develop an infrastructure for a proprietary target mode application at a low level maintained API.

- Initiator and target mode processes are both enabled.
- SLI enhancements for target mode applications—like Host Buffer Queues (HBQs)—for improved performance by allowing the target driver to customize the application’s buffer handling.
- Choices for customers to develop proprietary target mode solutions or Open Source products using the SCST infrastructure.

And because Emulex has taken a leadership position in advancing Open Source I/O connectivity and has gained market prominence for Linux IT deployments, our customers directly benefit from our contributions to the Open Source community, including:

- **Fibre Channel Transport Layer Architect**—Emulex architected and maintains the vendor-agnostic Fibre Channel Transport Layer that is now part of the Linux kernel. Emulex’s vast experience in the design and development of Fibre Channel controllers, and its strong partnerships with industry leading server, storage and software suppliers, is applied to critical Linux kernel components such as the Fibre Channel Transport.
- **sysfs development**—Emulex helped design sysfs (short for System File System) and provides a sysfs-compliant driver with standard Linux distributions. sysfs enables development and integration with third-party management tools and “homegrown” system administration tools such as perl scripts.

#### 17. Why should my company develop storage solutions around Emulex SAN connectivity products?

Emulex connectivity solutions are field-proved with over 7 million HBA ports deployed for mission critical SAN connectivity. Building products around our LightPulse® Fibre Channel HBAs and FCoE CNAs present storage solution developers with:

- The most advanced Linux driver architecture.
- Technology leadership in Linux, virtualization and storage networking.
- Leading quality and reliability.
- Highly efficient and scalable enterprise management.
- High performance, broad product offering.