

Windows Storport Miniport Drivers

Introduction:

This 3-day course gives developers the knowledge to design, write, and debug Windows Storport Miniport drivers.

At Course Completion

At the end of the course, students should be able to implement and/or understand a fully-featured Storport Miniport driver:

- Understand the storage architecture & strategy for Windows
- Construct a miniport driver for the Storport Port driver
- Have an understanding of Power Management for storage drivers
- Use filter (& layered) drivers
- Debug a device driver using standard tools
- Provide for installation of a device driver

Prerequisites

Before taking this course, students should have the following skills:

- C Programming Language competency
- Experience with C driver development environment for Windows (WDK)
- Experience with Windows Device Driver principles including ISR, DPC, user buffer strategies, etc.

Course Outline

Chapter 1: Introduction to the Windows Storage Architecture

- Storage Driver Architecture
- What is a storage class driver
- Responsibilities
- Storage interfaces
- Storage port drivers
- Storage filter drivers
- Storage miniport drivers

Chapter 2: Storport-Miniport Interaction

- Describe the sequence of events for handling an HBA request
- Device Extensions
- Physical vs. Virtual Miniport Drivers

Chapter 3: Miniport Construction

- The 17 Miniport functions
- The 6 Virtual miniport functions
- Miniport request queue
- Overlapped I/O
- Interrupt handling
- DMA operation in the miniport

Chapter 4: Interfacing with the Storport Driver

- Describe the Storport routines the miniport can use
- Restrictions on miniport code

Chapter 5: Power Management & Hot Plug Operation

- The Plug & Play Architecture of Windows
- Hot-plug devices
- OnNow initiative
- Power management issues
- Power management within the miniport

Chapter 6: WMI & Event Logging

- WMI Overview
- WMI Terms
- Managed Object Format
- MOF Compilers
- WBEMTest
- Event Logging Overview
- Error Packet Structure

Chapter 7: Debugging Windows Drivers

- The Windows “Blue Screen of Death”
- WinDbg
- Crash dumps
- DUMPEXAM & DUMPCHK
- Interactive debugging with WinDbg
- **Lab:** Using WinDbg

Chapter 8: Layered & Filter Drivers

- What is an Intermediate Driver
- Layered drivers
- Filter drivers
- Coupled drivers
- Connecting to other drivers
- **Lab:** Layered Driver

Chapter 9: Installing Windows Device Drivers

- Auto-install using INF files
- Manual installation
- The Driver Install Framework (DIFx)
- Driver certification & WHQL
- Digital signatures