Programming the Microsoft Windows Driver Model (2nd Edition) (Developer Reference)

By Walter Oney

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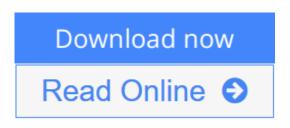**Programming the Microsoft Windows Driver Model (2nd Edition) (Developer Reference)** By Walter Oney

The Microsoft Windows driver model (WDM) supports Plug and Play, provides power management capabilities, and expands on the driver/minidriver approach. Written by long-time device-driver expert Walter Oney in cooperation with the Windows kernel team, this book provides extensive practical examples, illustrations, advice, and line-by-line analysis of code samples to clarify real-world driver-programming issues. And it's been updated with the latest details about the driver technologies in Windows XP and Windows 2000, plus more information about how to debug drivers.

Topics covered include:

- Beginning a driver project and the structure of a WDM driver; NEW: Minidrivers and class drivers, driver taxonomy, the WDM development environment and tools, management checklist, driver selection and loading, approved API calls, and driver stacks
- Basic programming techniques; NEW: Safe string functions, memory limits, the Driver Verifier scheme and tags, the kernel handle flag, and the Windows 98 floating-point problem
- Synchronization; NEW: Details about the interrupt request level (IRQL) scheme, along with Windows 98 and Windows Me compatibility
- The I/O request packet (IRP) and I/O control operations; NEW: How to send control operations to other drivers, custom queue implementations, and how to handle and safely cancel IRPs
- Plug and Play for function drivers; NEW: Controller and multifunction devices, monitoring device removal in user mode, Human Interface Devices (HID), including joysticks and other game controllers, minidrivers for non-HID devices, and feature reports
- Reading and writing data, power management, and Windows Management Instrumentation (WMI) NEW: System wakeup, the WMI control for idle detection, and using WMIMOFCK
- Specialized topics and distributing drivers; NEW: USB 2.0, selective suspend, Windows Hardware Quality Lab (WHQL) certification, driver selection and loading, officially approved API calls, and driver stacks

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Editorial Review

Amazon.com Review
Written for advanced C/C++ programmers, Walter Oney's *Programming the Microsoft Windows Driver Model* is a technically astute and clearly presented guide to writing custom Windows 2000 device drivers.

The author's command of the details of the new Windows Driver Model (WDM) standard is what makes this book such a clear success. (Because the WDM is rich in kernel and system services, the trick is often knowing how to use what's available rather than doing everything yourself.) The author presents a solid overview of the WDM architecture and breaks down the process of writing custom device drivers into manageable pieces, from the basics of loading device drivers to creating and processing I/O request packets. The book is very good at exposing kernel system calls, design principles, and programming techniques (such as managing synchronization and handling errors). There are also "nerd alerts" that point out extremely technical material.

This book shows you what you'll need to create WDM drivers that cooperate fully with Windows 2000 (and Windows 98). Features like Plug and Play (PnP), Windows power management, and the new Windows Management Instrumentation (WDM) standard get full attention here. There is plenty of sample code (plus a custom Visual C++ AppWizard that generates skeleton code for a default WDM driver) to get you started. Examples for working with the S5933 PCI chip set (and other simple hardware) let you see WDM drivers in action.

The process of writing device drivers certainly has changed from the early days of DOS. But armed with this handy and thorough book, C/C++ programmers can successfully create drivers for custom hardware that take full advantage of all the features of the powerful new WDM standard. *--Richard Dragan*

Topics covered: Windows Driver Model (WDM) overview and driver structure; kernel mode; physical filter, function and bus drivers; loading device drivers (DDs); driver objects; Windows 98 compatibility; kernel mode programming basics; error handling; memory management; synchronization; interrupt request levels, kernel synchronization objects, I/O request packets (IRPs), completion routines, plug and play (PnP) basics, reading and writing data, direct memory access (DMA) transfers, power management, error logging, watchdog timers, Windows Management Instrumentation (WMI), Universal Serial Bus (USB): bulk transfer and isochronous pipes; installing DDs: INF files, property pages, and Registry keys.

About the Author

Walter Oney has 35 years of experience in systems-level programming and has been teaching Windows device driver classes for 10 years. He was a contributing editor to Microsoft Systems Journal and is a Microsoft MVP. He has written several books, including Systems Programming for Windows 95 and the first edition of Programming the Microsoft Windows Driver Model. In his free time he's a committed jogger, a fan of classical dance, and an amateur oboist. He and his wife, Marty, live in Boston, Massachusetts.

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