WDM2 - Version: 1
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Windows XP/W2K3 Server WDM
Device Driver Development -
Advanced (Plug'n'Play, Power Management and WMI)
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Management and WMI)

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5 days Course

Description:

The students gain a thorough knowledge about the architecture of the Plug'n'Play and Power Management components of the Microsoft Windows operating systems and Windows Management Instrumentation. In addition to this they learn concepts and backgrounds of device driver development using the DDK and lots of practical tips and tricks.

Intended audience:

Windows driver developers who need a more comprehensive understanding of Plug'n'Play, a deeper insight into Power Management and a basic knowledge of Windows Management Instrumentation

Prerequisites:

Very good knowledge of the programming languages C and/or C++
Basic knowledge of Windows system programming and system administration
Knowledge of system and device driver development on other operating systems (e.g. Unix) is an advantage
Good knowledge of Microsoft development environments (Developer Studio)
Basic knowledge of driver and hardware related software development
Basic knowledge of Windows device driver development (Training course I) is absolutely necessary
Objectives:

Topics:

- Overview
- Plug'n'Play Basics
- System Architecture and kernel mode components
- Important registry keys
- Setup API, class installers, class co-installers, device co-installers
- Layered drivers

- Physical Device Object (PDO), Function Device Object (FDO) and Filter Device Object (FiDo)

- Plug'n'Play manager's device tree

- Plug'n'Play IRPs and - Plu'n'Play state transitions overview

- IRP_MN_START_DEVICE / IRP_MN_REMOVEDEVICE

- IRP_MN_STOPDEVICE and hardware resource reassignment

- Plug'n'Play routines in WDM drivers
- Advanced Plug'n'Play

- Multifunctional hardware

- System bus extender (MF.SYS)

- Virtual devices

- Bus driver functionality and Plug'n'Play IRPs for bus drivers

- IRP_MN_QUERY_DEVICE_RELATIONS, IRP_MN_QUERY_ID, IRP_MN_QUERY_DEVICE_TEXT

- Direct call interfaces
IRP_MN_QUERY_INTERFACE

Power management basics

System power states (S0-S5)

Device power states (D0-D3)

IRP_MN_QUERY_CAPABILITIES

Power state transitions during driver operation

Device power policy owner
Handling of IRP_MJ_POWER

System power IRPs and device driver power IRPs

IRP_MJ_POWER queues

Idle detection

Waking the system

DEVICE_CAPABILITIES and wake entries

Enabling wakeup by the power policy owner
IRP_MN_WAIT_WAKE

WMI architecture

IRP_MJ_SYSTEM_CONTROL and WMILIB

Object model and MOF resources

WMI properties

WMI events

WMI property and event consumer applications