Windows ACPI Emulated Devices Table

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Abstract

This specification contains details of an Advanced Configuration and Power Interface (ACPI) table that was created for use with Windows® operating systems when they are running in guest partitions in a virtual machine environment.

This information applies for the following operating systems:
 Windows 7
 Windows Server® 2008
 Windows Vista®
 Windows Server 2003

For the latest information, see:
 <http://www.microsoft.com/whdc/system/platform/virtual/WAET.mspx>

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Document History

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| Date | Change |  |  |  |
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# Introduction

Modern PC platforms often use devices that have known errata. In this case, the Windows® family of operating systems may include mechanisms to work around these known errata whenever possible. Two example devices are the real-time clock (RTC) and the ACPI power management (PM) timer, as implemented in some chipsets.

When an operating system runs as a guest in a virtualized environment, a device may be emulated by an underlying virtual machine monitor (VMM) or hypervisor. Unlike the actual device, the emulated device might not contain the errata. In this situation, special-case handling by the operating system software is unnecessary. Applying a needless work‑around to an emulated device can introduce unnecessary software overhead or lead to incorrect behavior when the operating system accesses the device.

To prevent the needless work-around, a Windows operating system that is running as a guest in a virtualized environment must be informed of the presence of a correctly functioning emulated RTC or ACPI PM timer. To accomplish this, Microsoft has defined the Windows ACPI enlightenment table (WAET).

Support for the WAET is included in the following versions of Windows:

* Windows 7
* Windows Server® 2003 Service Pack 2 (SP2)
* Windows Vista®
* Windows Server 2008

This document describes the layout of the WAET table, together with a more detailed description of the layout and contents of the Emulated Device Flags field.

# Windows ACPI Emulated Devices Table

To use the WAET in a virtualized environment, the virtual BIOS must create a static WAET table in the ACPI namespace of the guest partition. Supported versions of Windows operating systems read the WAET early during initialization. The Emulated Device Flags field describes the characteristics of any emulated device that is present in the partition.

## Windows ACPI Emulated Devices Table Format

Table details the layout of the WAET, which a virtual BIOS is responsible for building.

Table 1. Windows ACPI Emulated Devices Table

|  |  |  |  |
| --- | --- | --- | --- |
| Field | Byte length | Byte offset | Description |
| ***ACPI Standard Header*** |
| Signature | 4 | 0x0 | Signature for the WAET |
| Length | 4 | 0x4 | Length, in bytes, of the WAET |
| Revision | 1 | 0x8 | 1 |
| Checksum | 1 | 0x9 | Entire table, which must sum to zero |
| OEMID | 6 | 0x10 | Original equipment manufacturer (OEM) identifier (ID) |
| OEM Table ID | 8 | 0x16 | Manufacturer model ID |
| OEM Revision | 4 | 0x24 | OEM revision for supplied OEM table ID |
| Creator ID | 4 | 0x28 | Vendor ID of the ASL compiler utility that created the table |
| Creator Revision | 4 | 0x32 | Revision of the ASL compiler utility that created the table |
| Emulated Device Flags | 4 | 0x36 | Container of a bitmask of Windows behavior that this system requires |

## Emulated Device Flags

Table describes the bit definitions for the Emulated Device Flags field of the WAET.

Table 2. Emulated Device Flags Field

|  |  |
| --- | --- |
| Bit offset | Description |
| 0 | RTC goodIndicates whether the RTC has been enhanced not to require acknowledgment after it asserts an interrupt. With this bit set, an interrupt handler can bypass reading the RTC register C to unlatch the pending interrupt. |
| 1 | ACPI PM timer goodIndicates whether the ACPI PM timer has been enhanced not to require multiple reads. With this bit set, only one read of the ACPI PM timer is necessary to obtain a reliable value. |
| 31:2 | Reserved; must return 0 when read. |