USB Migration Support for Windows 7 Upgrade Scenarios

June 11, 2009

Abstract

This paper provides information about the support for migrating certain USB registry values when systems are upgraded from Windows Vista® to Windows® 7 or from Windows Server® 2008 to Windows Server 2008 R2. It provides guidelines for OEMs to validate that their customers experience smooth upgrades by identifying the registry values that are preserved during an upgrade scenario.

This information applies to the following operating systems:
 Windows Server 2008 R2
 Windows 7

 Windows Server 2008
 Windows Vista

References and resources discussed here are listed at the end of this paper.

The current version of this paper is maintained on the Web at:
 <http://www.microsoft.com/whdc/connect/USB/USB-Win7MigrationDLL.mspx>

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# Introduction

Some original equipment manufacturers (OEMs) that manufacture computer systems that include Universal Serial Bus (USB) ports and embedded USB devices have used certain registry values to modify the behavior of their systems when running Windows Vista or Windows Server 2008. In some situations, these registry values are critical to the basic functionality of a USB host controller or an embedded USB device. Some of these systems ship with non-default registry values to enable special functionality (often error recovery code paths) to ensure that users have the appropriate experiences. Thus, it is important that these registry values are preserved when such a system is upgraded to Windows 7 or Windows Server 2008 R2.

Windows 7 and Windows Server 2008 R2 include a feature to preserve and migrate these registry values during an upgrade from Windows Vista or Windows Server 2008. This feature is provided via a migration library, *UsbMigPlugin.dll*, that is responsible for copying these registry values and migrating them to the correct sections of the registry after Windows 7 or Windows Server 2008 R2 is installed. This ensures that users have a positive upgrade experience and that they have functional systems after the upgrade is complete.

With previous versions of Windows, users had to visit OEM Web sites after a clean installation of the operating system or after an upgrade from a previous Windows version to install the necessary OEM-provided patches that contain all of the necessary USB registry values. Although this manual process worked in most circumstances, it was cumbersome and problematic. Also, there were some situations where these registry values were required for all USB operations, and without them users lacked basic USB device functionality, which ultimately resulted in users uninstalling the new version of Windows.

With Windows 7 and Windows Server 2008 R2, users do not need to visit OEM Web sites or Windows Update to recreate these registry settings after upgrading from Windows Vista or Windows Server 2008. However, users can later choose to visit the OEM’s Web site, or preferably Windows Update, for additional OEM-provided software.

# Upgrade Scenarios

The following are the specific scenarios that use the USB migration library:

* Upgrade from Windows Vista with Service Pack 1 (SP1) or later to Windows 7.
* Upgrade from Windows Server 2008 to Windows Server 2008 R2.

The migration library is not used when a user upgrades from Windows Vista without Service Pack 1 or later.

# Migrated Registry Values

This section provides information about the USB-related registry values that are migrated during the previously mentioned upgrade scenarios. All other USB-related registry values are not migrated, but are re-created by the operating system during the Plug and Play portion of the Windows 7 or Windows Server 2008 R2 installation.

## Registry Values Under the Software Key

#### Registry location:

HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Control\Class\
{36FC9E60-C465-11CF-8056-444553540000}\<NNNN>

<NNNN> is the registry subkey that represents the specific USB host controller.

#### Registry values

|  |  |  |
| --- | --- | --- |
| Name | Type | Description |
| **ForceHCResetOnResume** | DWORD | Enables the USB host controller to issue a reset on resume from an S3 or S4 sleep state. |

## Registry Values Under the Hardware Key

#### Registry location:

HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Enum\PCI\<devnode>
\<instance>\Device Parameters

<devnode> is the registry subkey that represents the device node for the specific USB host controller.

<instance> is the registry subkey that represents the instance of the specific USB host controller.

#### Registry values

|  |  |  |
| --- | --- | --- |
| Name | Type | Description |
| **EnHcAsyncIdle** | DWORD | Disables the EHCI host controller asynchronous schedule when an idle condition is detected. |
| **EnHcPeriodicIdle** | DWORD | Disables the EHCI host controller periodic schedule when an idle condition is detected. |
| **EnHcSoftRetry** | DWORD | Enables retries of transfer descriptors on bulk or interrupt endpoints that complete with transaction error (XactErr) status. |

## Registry Values Under the Service Key

#### Registry location:

HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Services\USB

#### Registry values

|  |  |  |
| --- | --- | --- |
| Name | Type | Description |
| **DisableSelectiveSuspend** | DWORD | Disables selective suspend for all host controllers on the system. |
| **ForceHcD3NoWakeArm** | DWORD | Disables wake for all USB host controllers while the system runs on battery power. |

## USBFLAGS

#### Registry location:

HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\control\usbflags

#### Registry values:

All of the registry values under this registry key are migrated to Windows 7.

# USB Migration FAQ

This FAQ answers common questions about certain USB-related registry values.

What is the default behavior of the ForceHCResetOnResume registry value in Windows Vista or Windows Server 2008?

When Windows Vista was first released to manufacturing, the default behavior when a system resumed from an S3 or S4 sleep state was to force a reset on all USB host controllers. This caused the operating system to re-enumerate all of the USB devices. In theory, this reset was unnecessary because all USB devices should respond properly when a system resumes from an S3 or S4 sleep state without needing to be re-enumerated. Although this behavior helped some USB devices resume from the sleep state, it was not the best solution for all USB devices.

Knowledge Base article 928631, “A USB device may no longer work correctly after Windows Vista resumes from sleep or hibernation,” includes a hotfix that changed the default behavior to not force a reset on all USB host controllers when the system resumes from S3 or S4. All subsequent Windows Vista USB hotfixes and all Windows Vista service packs include this change. Also, this is the default behavior in Windows Server 2008.

Although this change fixed several USB device problems, it had the opposite effect of not being the right solution for USB devices that depended on being re-enumerated to return to a good working state. As a result, Microsoft added support for the **ForceHCResetOnReume** registry value in Windows Vista and Windows Server 2008 that could be added to the registry on a per-USB host controller basis. Setting this registry value to **1** results in the operating system forcing a reset of the USB host controller when the system resumes from S3 or S4. This registry value allows OEMs and end users to change a system back to the old behavior for specific USB host controllers that have USB devices attached that require re-enumeration when the system resumes from S3 or S4.

What is the default behavior of the ForceHCResetOnResume registry value in Windows 7 or Windows Server 2008 R2?

The default behavior in Windows 7 and Windows Server 2008 R2 is similar to the behavior in Windows Vista with SP1 or later or Windows Server 2008. The operating system does not force a reset of every USB host controller when the system resumes from S3 or S4. A Windows Logo Kit (WLK) requirement for Windows 7 and Windows Server 2008 R2 ensures that new systems do not include any embedded or external USB devices that require re-enumeration when the system resumes from S3 or S4. For an existing system that is upgraded from Windows Vista or Windows Server 2008 to Windows 7 or Windows Server 2008 R2, the upgrade installation migrates the **ForceHCResetOnResume** registry value to the Windows 7 or Windows Server 2008 R2 registry if it is found in the Windows Vista or Windows Server 2008 registry prior to the upgrade.

Does the USBBIOSx registry value have any effect in Windows 7?

Windows Vista, Windows Server 2008, Windows 7, and Windows Server 2008 R2 do not use the USBBIOSX registry value. For more information, see Knowledge Base article 841858, “Description of how to enable the S3 system power state for standby when USB devices are armed for wake.”

# Resources

The following links provide further information about USB and Windows operating system installation.

Welcome to Windows 7

<http://www.microsoft.com/windows/windows-7>

A USB device may no longer work correctly after Windows Vista resumes from sleep or from hibernation

<http://support.microsoft.com/kb/928631>

Description of how to enable the S3 system power state for standby when USB devices are armed for wake

<http://support.microsoft.com/kb/841858>