Bus Type and SCSI Address Reporting for ATA Devices

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Abstract

This paper describes the information that the Microsoft-supplied ATA port driver returns for serial and parallel Advanced Technology Attachment (ATA) devices. To support serial ATA devices and controllers, the ATA port driver now reports a new bus type and provides information about SATA devices in response to the IOCTL\_SCSI\_GET\_ADDRESS request.

Drivers or applications that work with storage devices and the ATA port driver must be prepared to handle this information so that they continue to operate correctly with Windows®.

This information applies to the following operating systems:
 Windows Server® 2008 R2
 Windows 7
 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/device/storage/ATAPortInfo.mspx>

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# Introduction

To support serial ATA (SATA) devices, the Microsoft-supplied ATA port driver (ATAPort.sys) includes the following changes:

* In Windows® 7 and Windows Server® 2008 R2, the ATA port driver reports a new bus type for serial ATA (SATA) devices.
* Beginning with Windows Vista®, the ATA port driver uses the SCSI\_ADDRESS structure to report the path ID, channel ID, and device ID of a parallel ATA (PATA) or SATA device.

Drivers and applications that work with storage devices and the ATA port driver must be prepared to handle this information. Existing drivers might require changes to work correctly on systems that support SATA hardware. Driver developers must carefully test their new and existing drivers to ensure that they respond correctly to these new and modified values.

This paper summarizes the changes that affect drivers or applications.

# Storage Bus Type

Windows 7 supports a new bus type for serial ATA devices: **BusTypeSata**. The Microsoft-supplied ATA port driver returns this value in response to the IOCTL\_STORAGE\_QUERY\_PROPERTY request for certain storage controllers and devices.

Drivers or applications that issue the IOCTL\_STORAGE\_QUERY\_PROPERTY request must be prepared to handle this value in the **BusType** member of the STORAGE\_ADAPTER\_DESCRIPTOR and STORAGE\_DEVICE\_DESCRIPTOR structures.

Tables 1 and 2 summarize the values that the ATA port driver returns in the **BusType** member of these structures in Windows 7, Windows Server 2008 R2, and Windows Vista.

Table 1. Bus Type Reported in STORAGE\_ADAPTER\_DESCRIPTOR Structure

|  |  |  |
| --- | --- | --- |
| Device type | Windows 7 and Server 2008 R2 value | Windows Vista value |
| PATA mode controller (including SATA controller working in PATA mode) | **BusTypeAta** | **BusTypeAta** |
| SATA mode controller | **BusTypeSata** | **BusTypeAta** |

Table 2. Bus Type Reported in STORAGE\_DEVICE\_DESCRIPTOR Structure

|  |  |  |
| --- | --- | --- |
| Device type | Windows 7 and Server 2008 R2 value | Windows Vista value |
| PATA hard disk drive | **BusTypeAta** | **BusTypeAta** |
| SATA hard disk drive (controller in SATA mode) | **BusTypeSata** | **BusTypeAta** |
| SATA hard disk drive (controller in PATA mode) | **BusTypeAta** | **BusTypeAta** |
| Optical drive | **BusTypeAtapi** | **BusTypeAtapi** |

# Return Value for IOCTL\_SCSI\_GET\_ADDRESS

To obtain information about how a storage device is connected, a driver or application issues the ioctl\_scsi\_get\_address request. The request returns a SCSI\_ADDRESS structure that contains information about the connection.

The SCSI\_ADDRESS structure is defined as follows:

typedef struct \_SCSI\_ADDRESS {
  ULONG  Length;
  UCHAR  PortNumber;
  UCHAR  PathId;
  UCHAR  TargetId;
  UCHAR  Lun;
}SCSI\_ADDRESS, \*PSCSI\_ADDRESS;

Beginning with Windows Vista, the ATA port driver returns the path ID, channel ID, and device ID for PATA and SATA devices in the SCSI\_ADDRESS structure, as follows:

Length

The length of this structure in bytes.

PortNumber

The path ID, which identifies the functional device object (FDO) and represents the order in which the PnP manager started the device. If more than one device is connected to the system, this value can change from one system boot to the next based on how quickly each device becomes ready.

PathId

The channel ID, which represents a physical bus. This value persists across reboots.

TargetId

The device ID, which is 0 to indicate a master device and 1 to indicate a subordinate device on a PATA bus. (Subordinate devices are sometimes called slave devices.) The value persists across reboots.

Lun

The logical unit number. ATA optical devices can support more than one LUN. This value persists across reboots.

Storage driver developers must ensure that their drivers are prepared to handle this information.

# Resources

#### Windows Driver Kit on MSDN®

IOCTl\_SCSI\_GET\_ADDRESS
<http://msdn.microsoft.com/en-us/library/ms803636.aspx>

STORAGE\_ADAPTER\_DESCRIPTOR
<http://msdn.microsoft.com/en-us/library/aa510105.aspx>

STORAGE\_DEVICE\_DESCRIPTOR
<http://msdn.microsoft.com/en-us/library/aa510117.aspx>