

DirectSetup

This section provides information about the Microsoft® DirectSetup® component of the Microsoft DirectX® application programming interface (API) in the Platform Software Development Kit (SDK) or the stand-alone DirectX SDK. Most of this section is oriented towards C++ developers. For information on Microsoft Visual Basic® setup, see Installing DirectX for Visual Basic Applications. This section includes the following topics:

- About DirectSetup
- DirectSetup Essentials
- Installing DirectX for Visual Basic Applications
- DirectSetup Reference
- DirectSetup Samples

About DirectSetup

Microsoft® DirectSetup® is a simple API that provides one-call installation of the Microsoft DirectX® components. This is more than a convenience—DirectX is a complex product, and installing it is an involved task. You should not attempt to install DirectX manually.

DirectSetup includes several API functions and structures. It also includes a prototype **DirectXSetupCallbackFunction** that can be defined by an application to customize the user interface during the installation process. The DirectX SDK includes a sample application that demonstrates the use of this callback function. For more information, see Dinstall Sample.

DirectSetup Essentials

This section contains general information about the Microsoft® DirectSetup® component. The following topics are discussed:

- Setup Overview for DirectSetup
- Preparing the Setup Folder
- Customizing Setup
- Testing the Setup Program
- Enabling AutoPlay

Setup Overview for DirectSetup

Applications and games that depend on Microsoft® DirectX® use the **DirectXSetup** function to install the necessary system components into an existing Microsoft Windows® installation. The function optionally updates the display and audio drivers for optimal support of DirectX. Typically, you would call **DirectXSetup** from the program that you are using to install your own application files.

Note

The **DirectXSetup** function overwrites system components from previous versions of DirectX. For example, if you install DirectX 8.0 on a system that already has DirectX 7.0 components, all DirectX 7.0 components are overwritten. Because all DirectX components comply with Component Object Model (COM) backward-compatibility rules, software written for DirectX 7.0 continues to function properly.

The **DirectXSetup** function can tell when DirectX components, display drivers, and audio drivers need to be upgraded. It can also distinguish whether or not these components can be upgraded without adversely affecting the Windows operating system. This is said to be a safe upgrade. The upgrade is safe for the operating system, not necessarily for the applications running on the computer. Some hardware-dependent applications can be negatively affected by an upgrade that is safe for Windows.

By default, the **DirectXSetup** function performs only safe upgrades. If the upgrade of a device driver might adversely affect the operation of Windows, the upgrade is not performed.

During the setup process, DirectSetup creates a backup copy of the system components and drivers that are replaced. These can be restored if problems occur.

When display or audio drivers are upgraded, the **DirectXSetup** function uses a database created by Microsoft to manage the process. The database contains information on existing drivers that are provided by Microsoft, the manufacturers of the hardware, or the vendors of the hardware. This database describes the upgrade status of each driver, based on testing done at Microsoft and other sites.

Check the value returned by **DirectXSetup**. If it is DSETUPERR_SUCCESS_RESTART, notify the user that changes do not take effect without a restart, and offer the choice of restarting immediately. See Dinstall.c in the Dinstall sample application for an example of how to do this.

Preparing the Setup Folder

The **DirectXSetup** function takes a parameter, *lpzRootPath*, that points to the root directory of the installation. It can be NULL to indicate that the root path is the current directory—that is, the directory where your setup program resides.

The root directory must contain Dsetup.dll, and Dsetup32.dll. It must also have a folder named "DirectX" (this name is not case sensitive), containing all the redistributable files and drivers. To create the proper structure on your application

setup disk, copy the entire contents of the Dxf\Redist\DirectX8 folder on the Microsoft® DirectX® SDK disk into the root path of your setup program. This folder was not copied to your development computer when you installed the SDK, so you have to get it from the original disk.

Customizing Setup

Microsoft® DirectSetup® enables you to define a callback function for customizing the Microsoft DirectX® setup process. In the DirectSetup documentation, this callback function is referred to as **DirectXSetupCallbackFunction**, but you can give it any name.

If a callback function is not provided by the setup program, the **DirectXSetup** function displays status and error information in a dialog box and obtains user input by calling the Microsoft Win32® **MessageBox** function. If a callback is provided, the information that would have been used to create the status dialog or message box is instead passed to the callback. The callback function is called once for each DirectX component and device driver that can be installed or upgraded.

You can use the callback function to do the following:

- Employ a custom interface. Your setup program might display messages in ways other than by using **MessageBox** or standard Microsoft Windows® dialog boxes. The callback function enables you to integrate messages for the DirectX component of your installation into your own interface.
- Update a progress indicator.
- Suppress the display of status and error messages. Designers of programs for novice users might want to suppress error messages and let the setup program handle errors and make upgrade choices silently. This approach requires a greater development effort for the setup program, but it might be appropriate for the target audience.

The following topics help you customize your setup:

- Creating a DirectSetup Callback Function
- Setting the Callback Function
- Using Upgrade Flags in the Callback Function
- Overriding Defaults in the Callback Function

Creating a DirectSetup Callback Function

To customize the setup process, first create a callback function that conforms to the **DirectXSetupCallbackFunction** prototype, as in the following declaration:

```
DWORD WINAPI DirectXSetupCallbackFunction(  
    DWORD dwReason,  
    DWORD dwMsgType,
```

```
LPSTR szMessage,  
LPSTR szName,  
void *pInfo);
```

In this example, adapted from the Dinstall sample application, the name of the function is the same as that of the prototype, but this is optional. The parameter names differ slightly from those in the prototype declared in the Dsetup.h header file and are used throughout the following discussion.

Parameters

The *dwReason* parameter indicates why the callback function has been called. The possible values are listed and explained in the reference for **DirectXSetupCallbackFunction**.

The *dwMsgType* parameter receives flags equivalent to those that Microsoft® DirectSetup® would, by default, pass to **MessageBox**, such as those controlling which buttons and icons are displayed. Of special interest are the button flags, which you use to determine what return values are expected. If this value is 0, the event never requires user input, and DirectSetup normally displays a status message.

The *szMessage* parameter receives the same text that DirectSetup would otherwise pass to the status dialog box or to **MessageBox**.

When a driver is a candidate for upgrading, its name is passed in the *szName* parameter, and *pInfo* points to information about how the upgrade is to be handled—for example, whether DirectSetup recommends that the old driver be kept or upgraded. For more information, see Using Upgrade Flags in the Callback Function.

The way your callback function interprets the parameters is entirely up to you. Typically, you would choose which messages to display (based on *dwReason*) and when to present the user with alternatives, and you would modify the interface accordingly.

Return Value

The value returned by your callback function must conform to the following rules:

- When *dwMsgType* is 0, the return value must be IDOK. In this case, there are no choices to be made by the user. (Your application, of course, is free to display a status message, even though no input is required.)
- If *dwMsgType* is nonzero, the return value must be the same as would have been returned by **MessageBox**, given the equivalent choice by the user.

To determine the appropriate return value in the second case, test *dwMsgType* for the buttons that would normally have been put in a message box. The following example, from the **GetReply** function in Dinstall, shows how this is done:

```
/* The global g_wReply identifies the custom dialog button  
that has been selected by the user. */
```

```
switch (dwMsgType & 0x0000000F)
{
    /* There would normally have been an OK and a Cancel button.
       IDBUT1 is equivalent to the OK button. If the user did not
       choose that, it was a Cancel. */
    case MB_OKCANCEL:
        wDefaultButton = (g_wReply == IDBUT1) ? IDOK : IDCANCEL;
        break;

    /* And so on with the other button combinations. */
    case MB_OK:
        wDefaultButton = IDOK;
        break;
    case MB_RETRYCANCEL:
        wDefaultButton = (g_wReply == IDBUT1) ? IDRETRY : IDCANCEL;
        break;
    case MB_ABORTRETRYIGNORE:
        if (g_wReply == IDBUT1)
            wDefaultButton = IDABORT;
        else if (g_wReply == IDBUT2)
            wDefaultButton = IDRETRY;
        else
            wDefaultButton = IDIGNORE;
        break;
    case MB_YESNOCANCEL:
        if (g_wReply == IDBUT1)
            wDefaultButton = IDYES;
        else if (g_wReply == IDBUT2)
            wDefaultButton = IDNO;
        else
            wDefaultButton = IDCANCEL;
        break;
    case MB_YESNO:
        wDefaultButton = (g_wReply == IDBUT1) ? IDYES : IDNO;
        break;
    default:
        wDefaultButton = IDOK;
}
```

This routine translates button clicks from the custom interface into the equivalent button identifiers in the standard dialog box that `DirectSetup` would otherwise create. The *wDefaultButton* variable is set to the identifier of the equivalent standard dialog box button, and this value is ultimately returned from the callback function.

You do not necessarily have to give the user a choice, even when *dwMsgType* is nonzero. You might decide, for example, to upgrade drivers automatically even if DirectSetup would normally ask for confirmation from the user. The Dinstall sample does this when the user has asked to see only problem messages and the driver upgrade is considered safe, as follows:

```
case DSETUP_CB_UPGRADE_SAFE:
    switch (dwMsgType & 0x0000000F)
    {
        case MB_YESNO:
        case MB_YESNOCANCEL:
            return IDYES;
        case MB_OKCANCEL:
        case MB_OK:
        default:
            return IDOK;
    }
    break;
```

The callback function returns either IDYES or IDOK, depending on which button would have represented a positive choice in a dialog box asking the user whether or not the upgrade should proceed.

Setting the Callback Function

Before calling **DirectXSetup**, notify Microsoft® DirectSetup® that you want to use a callback by calling the **DirectXSetupSetCallback** function, passing a pointer to the callback as a parameter. The following example shows how this is done:

```
DirectXSetupSetCallback(
    (DSETUP_CALLBACK) DirectXSetupCallbackFunction);
```

Using Upgrade Flags in the Callback Function

When the application-defined callback function **DirectXSetupCallbackFunction** is called by the **DirectXSetup** function, it is passed a parameter that contains the reason that the callback function was invoked. If the reason is **DSETUP_CB_MSG_CHECK_DRIVER_UPGRADE**, the *pInfo* parameter points to a **DSETUP_CB_UPGRADEINFO** structure containing flags that summarize the **DirectXSetup** function recommendations on how to perform the upgrade of Microsoft® DirectX® components and drivers. The structure member containing the flags is called **UpgradeFlags**.

The flags fall into the following categories:

Primary Upgrade Flags

These flags are mutually exclusive. One of them is always present in the **UpgradeFlags** structure member. You can extract it by performing a bitwise **AND** operation with DSETUP_CB_UPGRADE_TYPE_MASK.

DSETUP_CB_UPGRADE_FORCE

DSETUP_CB_UPGRADE_KEEP

DSETUP_CB_UPGRADE_SAFE

DSETUP_CB_UPGRADE_UNKNOWN

Secondary Upgrade Flags

Either one or both of these flags can be present.

DSETUP_CB_UPGRADE_CANTBACKUP

DSETUP_CB_UPGRADE_HASWARNINGS

Device Active Flag

This flag is present if the device whose driver is being upgraded is active. It can be combined with any of the others.

DSETUP_CB_UPGRADE_DEVICE_ACTIVE

Device Class Flags

These flags are mutually exclusive. One of them is always present.

DSETUP_CB_UPGRADE_DISPLAY

DSETUP_CB_UPGRADE_MEDIA

In summary: every time the *Reason* parameter has the value DSETUP_CB_MSG_CHECK_DRIVER_UPGRADE, the **UpgradeFlags** member of the structure pointed to by *pInfo* contains one Primary Upgrade Flag, zero or more Secondary Upgrade Flags, zero or one Device Active Flag, and one Device Class Flag.

If the **UpgradeFlags** member is set to DSETUP_CB_UPGRADE_KEEP, the DirectX component or device driver cannot be upgraded without causing Microsoft Windows® to cease functioning properly. The **DirectXSetup** function does not perform an upgrade on the component or driver.

A value of DSETUP_CB_UPGRADE_FORCE in **UpgradeFlags** means that the component or driver must be upgraded for Windows to function properly. The **DirectXSetup** function upgrades the driver or component. It is possible that the upgrade might adversely affect some programs on the system. When the **DirectXSetup** function detects this condition, the **UpgradeFlags** member is set to (DSETUP_CB_UPGRADE_FORCE | DSETUP_CB_UPGRADE_HAS_WARNINGS). When this occurs, the **DirectXSetup** function performs the upgrade but issues a warning to the user.

Components and drivers are considered safe for upgrade if they do not adversely affect the operation of Windows when they are installed. In this case, the **UpgradeFlags** member is set to DSETUP_CB_UPGRADE_SAFE. It is possible that the upgrade can be safe for Windows but still cause problems for programs installed on the system. When **DirectXSetup** detects this condition, the **UpgradeFlags** member contains the value (DSETUP_CB_UPGRADE_SAFE |

DSETUP_CB_UPGRADE_HAS_WARNINGS). If this condition occurs, the default action for the **DirectXSetup** function is not to perform the upgrade.

Overriding Defaults in the Callback Function

The application-defined function **DirectXSetupCallbackFunction** can override some of the default behaviors of the **DirectXSetup** function through its return value.

For example, the default behavior for **DirectXSetup** is not to install a component if the upgrade type in the structure pointed to by the *pInfo* parameter is set to (DSETUP_CB_UPGRADE_SAFE | DSETUP_CB_UPGRADE_HAS_WARNINGS). In this case, the *MsgType* parameter of the callback function is set to (MB_YESNO | MB_DEFBUTTON2). Without a callback function, Microsoft® DirectSetup® would present the user with a dialog box whose default button was **No**. If the callback function does not seek user input but accepts the default, it returns IDNO. To override the default, the callback function returns IDYES. If it does override the default, the **DirectXSetup** function notifies the user.

Testing the Setup Program

To test the Microsoft® DirectSetup® component of your setup program, compile a version in which the DSETUP_TESTINSTALL flag is passed to the **DirectXSetup** function. Set up the installation directory, as described in Preparing the Setup Folder.

When you run your setup program, DirectSetup goes through the motions of installing Microsoft DirectX®, including calls to a callback function if you have provided one, without actually installing any components.

Enabling AutoPlay

If you are building an AutoPlay compact disc title, copy the Autorun.inf file in the root directory of the Microsoft® DirectX® SDK compact disc to the root of your application directory. This text file contains the following information:

```
[autorun]
OPEN=SETUP.EXE
```

If your application's setup program is called Setup.exe, you do not have to make any changes to this file; otherwise, edit this file to contain the name of your setup program.

Installing DirectX for Visual Basic Applications

Although you can use the Microsoft® DirectSetup® functions in your Microsoft Visual Basic® application by declaring references to the functions in your module, the recommended method is to use the Application Wizard. To distribute your application through a compact disc, follow these steps.

Distributing your Visual Basic application

1. Start the Application Wizard.
2. Remove DxVBLib.dll from the dependency list.
3. Add all the files in the Redist folder from the Microsoft DirectX® SDK CD located in \Dxf\Redist\Directx7 for retail and \Dxf\Debug for debug.
4. Click **Finish** to exit the Application Wizard.
5. Overwrite Setup1.exe (created by the Application Wizard) with Setup1.exe from the support folder on the DirectX SDK CD.
6. If you are using Visual Basic 5.0, use the compress utility to compress Setup1.exe to Setup1.ex_. If you are developing on Visual Basic 6.0, run the batch file created by the Application Wizard.

The files are now ready to be distributed through a compact disc.

DirectSetup Reference

This section contains reference information for the Microsoft® DirectSetup® API elements. Reference material is divided into the following categories:

- Functions
- Structures
- Return Values

This reference section is mainly used when programming in C++; for Microsoft DirectX® for Microsoft Visual Basic® setup information, see Installing DirectX for Visual Basic Applications.

Functions

This section contains information on the following global functions used with Microsoft® DirectSetup®:

- **DirectXRegisterApplication**

- **DirectXSetup**
- **DirectXSetupCallbackFunction**
- **DirectXSetupGetVersion**
- **DirectXSetupSetCallback**
- **DirectXUnRegisterApplication**

DirectXRegisterApplication

Registers an application as one designed to work with DirectPlayLobby.

```
int WINAPI DirectXRegisterApplication(  
    HWND hWnd,  
    LPDIRECTXREGISTERAPP lpDXRegApp  
);
```

Parameters

hWnd

Handle of the parent window. If this parameter is set to NULL, the desktop is the parent window.

lpDXRegApp

Address of the **DIRECTXREGISTERAPP** structure that contains the registry entries that are required for the application to function properly with DirectPlayLobby.

Return Values

If this function succeeds, it returns TRUE.

If it fails, it returns FALSE. Call the **GetLastError** function to get extended error information.

Remarks

The **DirectXRegisterApplication** function has to have both Dsetup.dll and Dsetup32.dll. These files are not installed on the system, but they are included in the SDK.

Requirements

Windows NT/2000: Requires Windows 2000.

Windows 95/98: Requires Windows 95 or later. Available as a redistributable for Windows 95.

Header: Declared in Dsetup.h.

Import Library: Use Dsetup.lib.

See Also

DirectXUnRegisterApplication

DirectXSetup

Installs one or more Microsoft® DirectX® components.

```
int WINAPI DirectXSetup(
    HWND hWnd,
    LPSTR lpszRootPath,
    DWORD dwFlags
);
```

Parameters

hWnd

Handle of the parent window for the setup dialog boxes.

lpszRootPath

Address of a string that contains the root path of the DirectX component files. This string must specify a full path to the directory that contains the files Dsetup.dll, and Dsetup32.dll, as well as a "DirectX" (this name is not case sensitive) directory containing redistributable files. If this value is NULL, the current working directory is used.

dwFlags

One or more flags indicating which DirectX components should be installed. A full installation (DSETUP_DIRECTX) is recommended.

DSETUP_D3D	Obsolete. DirectX programs that use this flag install all DirectX components.
DSETUP_DDRAW	Obsolete. DirectX programs that use this flag install all DirectX components.
DSETUP_DDRAWDRV	Not used in DirectX 8.0.
DSETUP_DINPUT	Obsolete. DirectX programs that use this flag install all DirectX components.
DSETUP_DIRECTX	Installs DirectX run-time components, as well as DirectX-compatible display and audio drivers.
DSETUP_DIRECTXSETUP	Obsolete. DirectX programs that use this flag install all DirectX components.
DSETUP_DPLAY	Obsolete. DirectX programs that use this flag install all DirectX components.
DSETUP_DPLAYSP	Obsolete. DirectX programs that use this flag install all DirectX components.
DSETUP_DSOUND	Obsolete. DirectX programs that use this flag

DSETUP_DSOUNDDRV	install all DirectX components.
DSETUP_DXCORE	Not used in DirectX 8.0.
	Installs DirectX run-time components. Does not install DirectX-compatible display and audio drivers.
DSETUP_TESTINSTALL	Performs a test installation. Does not install new components.
DSETUP_USEROLDERFLAG	Enables the return of -14, which means that the installed version of DirectX is newer than the version being installed.

Return Values

If this function succeeds, it returns one of the following success codes:

DSETUPERR_SUCCESS	Success.
DSETUPERR_SUCCESS_RESTART	Success, but the user must restart the system for the changes to take effect.

If it fails, it returns an error value. For a list of possible return values, see Return Values.

Remarks

Before using the **DirectXSetup** function in your setup program, ensure that there is at least 15 MB of available disk space on the system. This is the maximum space required for DirectX to set up the appropriate files. If the system already contains the DirectX files, this space is not needed.

Requirements

Windows NT/2000: Requires Windows NT 4.0 SP3 or later.

Windows 95/98: Requires Windows 95 or later. Available as a redistributable for Windows 95.

Header: Declared in Dsetup.h.

Import Library: Use Dsetup.lib.

DirectXSetupCallbackFunction

A placeholder name for an optional callback function supplied by the setup program. If present, it is called once for each step in the setup process.

```
DWORD DirectXSetupCallbackFunction(
    DWORD Reason,
    DWORD MsgType,
    char *szMessage,
```

```

char *szName,
void *pInfo
);

```

Parameters

Reason

Reason for the callback. It can be one of the following values:

DSETUP_CB_MSG_BEGIN_INSTALL

DirectXSetup is about to begin installing Microsoft® DirectX® components and device drivers.

DSETUP_CB_MSG_BEGIN_INSTALL_DRIVERS

DirectXSetup is about to begin installing device drivers.

DSETUP_CB_MSG_BEGIN_INSTALL_RUNTIME

DirectXSetup is about to begin installing DirectX components.

DSETUP_CB_MSG_BEGIN_RESTORE_DRIVERS

DirectXSetup is about to begin restoring previous drivers.

DSETUP_CB_MSG_CANTINSTALL_BETA

A prerelease Beta version of the Microsoft Windows® 95 operating system was detected. The DirectX component or device driver cannot be installed.

DSETUP_CB_MSG_CANTINSTALL_NOTWIN32

The operating system detected is not a Windows 32-bit operating system. DirectX is not compatible with Windows 3.x.

DSETUP_CB_MSG_CANTINSTALL_NT

The DirectX component or device driver cannot be installed on versions of the Microsoft Windows NT® operating system prior to version 4.0.

DSETUP_CB_MSG_CANTINSTALL_UNKNOWNOS

The operating system is unknown. The DirectX component or device driver cannot be installed.

DSETUP_CB_MSG_CANTINSTALL_WRONGLANGUAGE

The DirectX component or device driver is not localized to the language being used by Windows.

DSETUP_CB_MSG_CANTINSTALL_WRONGPLATFORM

The DirectX component or device driver is for another type of computer.

DSETUP_CB_MSG_CHECK_DRIVER_UPGRADE

Driver is being considered for upgrade. Verification from user is recommended.

DSETUP_CB_MSG_FILECOPYERROR

Setup of the DirectX component or device driver file has failed during the copy process.

DSETUP_CB_MSG_INTERNAL_ERROR

An internal error has occurred. Setup of the DirectX component or device driver has failed.

DSETUP_CB_MSG_NOMESSAGE

No message to be displayed. The callback function should return.

DSETUP_CB_MSG_NOTPREINSTALLEDONNT

The DirectX component or device driver cannot be installed on the version of Microsoft Windows NT or Microsoft Windows 2000 in use.

DSETUP_CB_MSG_OUTOFDISKSPACE

Setup of the DirectX component has failed due to lack of disk space.

DSETUP_CB_MSG_PREINSTALL_NT

DirectX is already installed on the version of Windows NT or Windows 2000 in use.

DSETUP_CB_MSG_SETUP_INIT_FAILED

Setup of the DirectX component or device driver has failed.

MsgType

Flags that control the display of a message box. These flags can be passed to the **MessageBox** function. An exception is when *MsgType* is 0. In that case, the setup program can display status information but should not wait for input from the user.

szMessage

Pointer to a localized character string containing error or status messages that can be displayed in a dialog box created with the **MessageBox** function.

szName

NULL unless the *Reason* parameter is

DSETUP_CB_MSG_CHECK_DRIVER_UPGRADE. In that case, *szName* contains a pointer to the name of the driver to be upgraded.

pInfo

Pointer to the address of a structure containing upgrade information. When *Reason* is DSETUP_CB_MSG_CHECK_DRIVER_UPGRADE, the setup program is upgrading a driver and asking the user whether the upgrade should take place. In this case, *pInfo* points to a **DSETUP_CB_UPGRADEINFO** structure containing information about the upgrade.

Return Values

The return value should be the same as the value that would be returned by the **MessageBox** function, with one exception. If this function returns 0, the **DirectXSetup** function performs the default action for upgrade of the DirectX component or driver.

Remarks

The name of **DirectXSetupCallbackFunction** is supplied by the setup program. The **DirectXSetupSetCallback** function is used to pass the address of the callback function to DirectSetup.

If *MsgType* is 0, the setup program can display status information, but it should not wait for user input. In this case, the function returns IDOK.

Requirements

Windows NT/2000: Requires Windows 2000.

Windows 95/98: Requires Windows 95 or later. Available as a redistributable for Windows 95.

Header: Declared in Dsetup.h.

Import Library: User-defined.

See Also

[MessageBox](#), [DirectXSetupSetCallback](#), Customizing Setup

DirectXSetupGetVersion

Retrieves the version number of the Microsoft® DirectX® components that are currently installed.

```
INT WINAPI DirectXSetupGetVersion(  
    DWORD *pdwVersion,  
    DWORD *pdwRevision  
);
```

Parameters

pdwVersion

Pointer to the address of a variable to receive the version number. This parameter can be NULL if the version number is not wanted.

pdwRevision

Pointer to the address of a variable to receive the revision number. This parameter can be NULL if the revision number is not wanted.

Return Values

If the function succeeds, it returns nonzero.

If it fails, it returns 0.

Remarks

The **DirectXSetupGetVersion** function can be used to retrieve the version and revision numbers before or after the **DirectXSetup** function is called. If it is called before **DirectXSetup** is invoked, it gives the version and revision numbers of the DirectX components that are currently installed. If it is called after **DirectXSetup** is called, but before the computer is restarted, it gives the version and revision numbers of the DirectX components that take effect after the computer is restarted.

The version number in the *pdwVersion* parameter is composed of the major version number and the minor version number. The major version number is in the 16 most significant bits of the **DWORD** when this function returns. The minor version number is in the 16 least significant bits of the **DWORD** when this function returns. The version numbers can be interpreted as follows:

DirectX version	Value pointed to by <i>pdwVersion</i>
DirectX 1	0x00000000
DirectX 2	0x00000000
DirectX 3	0x00000000
DirectX 5.0	0x00040005
DirectX 6.0	0x00040006
DirectX 7.0	0x00040007
DirectX 8.0	0x00040008

There is no version 4 of DirectX.

The version number in the *pdwRevision* parameter is composed of the release number and the build number. The release number is in the 16 most significant bits of the **DWORD** when this function returns. The build number is in the 16 least significant bits of the **DWORD** when this function returns.

The following sample code fragment demonstrates how the information returned by **DirectXSetupGetVersion** can be extracted and used.

```

DWORD dwVersion;
DWORD dwRevision;
if (DirectXSetupGetVersion(&dwVersion, &dwRevision))
{
    printf("DirectX version is %d.%d.%d.%d\n",
        HIWORD(dwVersion), LOWORD(dwVersion),
        HIWORD(dwRevision), LOWORD(dwRevision));
}

```

Version and revision numbers can be concatenated into a 64-bit quantity for comparison. The version number is in the 32 most significant bits and the revision number is in the 32 least significant bits.

Requirements

Windows NT/2000: Requires Windows NT 4.0 SP3 or later.

Windows 95/98: Requires Windows 95 or later. Available as a redistributable for Windows 95.

Header: Declared in Dsetup.h.

Import Library: Use Dsetup.lib.

See Also

DirectXSetup

DirectXSetupSetCallback

Sets a pointer to a callback function that is periodically called by **DirectXSetup**. The callback function can be used for setup progress notification and to implement a custom user interface for an application's setup program. For more information, see **DirectXSetupCallbackFunction**. If a setup program does not provide a callback function, **DirectXSetupSetCallback** is not invoked.

```
INT WINAPI DirectXSetupSetCallback(  
    DSETUP_CALLBACK Callback  
);
```

Parameters

Callback

Address of a callback function.

Return Values

Currently returns 0.

Remarks

To set a callback function, **DirectXSetupSetCallback** must be called before **DirectXSetup** is called.

The name of the callback function passed to **DirectXSetupSetCallback** is supplied by the setup program. However, it must match the prototype given in **DirectXSetupCallbackFunction**.

Requirements

Windows NT/2000: Requires Windows NT 4.0 SP3 or later.

Windows 95/98: Requires Windows 95 or later. Available as a redistributable for Windows 95.

Header: Declared in Dsetup.h.

Import Library: Use Dsetup.lib.

See Also

DirectXSetupCallbackFunction, **DirectXSetup**

DirectXUnRegisterApplication

Deletes the registration of an application designed to work with DirectPlayLobby.

```
int WINAPI DirectXUnRegisterApplication(  
    HWND hWnd,  
    LPGUID lpGUID  
);
```

Parameters

hWnd

Handle of the parent window. Set this to NULL if the desktop is the parent window.

lpGUID

Address of a GUID that represents the Microsoft® DirectPlay® application to be unregistered.

Return Values

If the function succeeds, the return value is TRUE. This means that the registration is successfully deleted.

If the function fails, the return value is FALSE.

Remarks

The **DirectXUnRegisterApplication** function has to have both Dsetup.dll and Dsetup32.dll. These two files are not installed on the system, but they are included in the SDK.

Requirements

Windows NT/2000: Requires Windows 2000.

Windows 95/98: Requires Windows 95 or later. Available as a redistributable for Windows 95.

Header: Declared in Dsetup.h.

Import Library: Use Dsetup.lib.

See Also

DirectXRegisterApplication

Structures

This section contains information about the following structures used with Microsoft® DirectSetup®:

- **DIRECTXREGISTERAPP**
- **DSETUP_CB_UPGRADEINFO**

Note

The memory for all Microsoft DirectX® structures must be initialized to 0 before use. In addition, all structures that contain a **dwSize** member must set the member to the size of the structure, in bytes, before use.

DIRECTXREGISTERAPP

Contains the registry entries needed for applications designed to work with DirectPlayLobby.

```
typedef struct _DIRECTXREGISTERAPP {
    DWORD dwSize;
    DWORD dwFlags;
    LPSTR lpszApplicationName;
    LPGUID lpGUID;
    LPSTR lpszFilename;
    LPSTR lpszCommandLine;
    LPSTR lpszPath;
    LPSTR lpszCurrentDirectory;
} DIRECTXREGISTERAPP, *PDIRECTXREGISTERAPP,
*LPDIRECTXREGISTERAPP;
```

Members

dwSize

Size of the structure. This member must be initialized to the size of the **DIRECTXREGISTERAPP** structure.

dwFlags

Reserved for future use.

lpszApplicationName

Name of the application.

lpGUID

Globally unique identifier (GUID) of the application.

lpszFilename

Name of the executable file to be called.

lpszCommandLine

Command-line arguments for the executable file.

lpszPath

Path of the executable file.

lpszCurrentDirectory

Current directory. This is typically the same as **lpszPath**.

Requirements

Windows NT/2000: Requires Windows 2000.

Windows 95/98: Requires Windows 95 or later. Available as a redistributable for Windows 95.

Header: Declared in Dsetup.h.

DSETUP_CB_UPGRADEINFO

Passed as a parameter to the application-defined **DirectXSetupCallbackFunction**. It contains valid information only when the *Reason* parameter is DSETUP_CB_MSG_CHECK_DRIVER_UPGRADE. Callback functions can use it to get status information on the upgrade that is about to be done.

```
typedef struct _DSETUP_CB_UPGRADEINFO {
    DWORD UpgradeFlags;
} DSETUP_CB_UPGRADEINFO;
```

Members

UpgradeFlags

One or more flags indicating the status of the upgrade. The following values are defined:

DSETUP_CB_UPGRADE_CANTBACKUP

The old system components cannot be backed up. Upgrade can be performed, but the components or drivers cannot be restored later.

DSETUP_CB_UPGRADE_DEVICE_ACTIVE

The device is currently in use.

DSETUP_CB_UPGRADE_DEVICE_DISPLAY

The device driver being upgraded is for a display device.

DSETUP_CB_UPGRADE_DEVICE_MEDIA

The device driver being upgraded is for a media device.

DSETUP_CB_UPGRADE_FORCE

Microsoft® Windows® might not function correctly if the component is not upgraded. The upgrade will be performed.

DSETUP_CB_UPGRADE_HASWARNINGS

Microsoft DirectSetup® can upgrade the driver for this device, but doing so might affect one or more programs on the system. The *szMessage* parameter contains the names of the programs that might be affected. Upgrade not recommended.

DSETUP_CB_UPGRADE_KEEP

The system might fail if this device driver is upgraded. Upgrade not allowed.

DSETUP_CB_UPGRADE_SAFE

DirectSetup can safely upgrade this device driver. Upgrade recommended. A safe upgrade will not adversely affect the operation of Windows. Some hardware-dependent programs might be adversely affected.

DSETUP_CB_UPGRADE_UNKNOWN

DirectSetup does not recognize the existing driver for this device. This value occurs frequently. Upgrading might adversely affect the use of the device. It is strongly recommended that the upgrade not be performed.

Remarks

Use the DSETUP_CB_UPGRADE_TYPE_MASK value to extract the upgrade type (FORCE, KEEP, SAFE, or UNKNOWN) from **UpgradeFlags**.

Requirements

Windows NT/2000: Requires Windows 2000.

Windows 95/98: Requires Windows 95 or later. Available as a redistributable for Windows 95.

Header: Declared in Dsetup.h.

See Also

DirectXSetupCallbackFunction

Return Values

The **DirectXSetup** function can return the following values. It can also return a standard COM error.

DSETUPERR_SUCCESS

Setup was successful, and no restart is required.

DSETUPERR_SUCCESS_RESTART

Setup was successful, and a restart is required.

DSETUPERR_BADSOURCESIZE

A file's size could not be verified or was incorrect.

DSETUPERR_BADSOURCETIME

A file's date and time could not be verified or were incorrect.

DSETUPERR_BADWINDOWSVERSION

Microsoft® DirectX® does not support the Microsoft Windows® version on the system.

DSETUPERR_CANTFINDDIR

The setup program could not find the working directory.

DSETUPERR_CANTFINDINF

A required .inf file could not be found.

DSETUPERR_INTERNAL

An internal error occurred.

DSETUPERR_NEWERVERSION

A later version of DirectX has already been installed. Applications can safely ignore this error because the newer version is not overwritten and is fully compatible with applications written for earlier versions.

DSETUPERR_NOTADMIN

The current user does not have administrative privileges. On Windows 2000 systems, the user may need administrative privileges for some setup operations.

DSETUPERR_NOCOPY

A file's version could not be verified or was incorrect.

DSETUPERR_NOTPREINSTALLEDONNT

The version of Windows NT® or Windows 2000 on the system does not contain the current version of DirectX. An older version of DirectX might be present, or DirectX might be absent altogether.

DSETUPERR_OUTOFDISKSPACE

The setup program ran out of disk space during installation.

DSETUPERR_SOURCEFILENOTFOUND

One of the required source files could not be found.

DSETUPERR_UNKNOWNOS

The operating system on your system is not currently supported.

DSETUPERR_UNSUPPORTEDPROCESSOR

The processor type is unsupported. DirectX 8 supports only Pentium or K6-compatible or higher processors.

DSETUPERR_USERHITCANCEL

The **Cancel** button was pressed before the application was fully installed.

DirectSetup Samples

The following sample programs demonstrate the use and capabilities of Microsoft® DirectSetup®:

- Dinstall Sample (C/C++)
- DXVBSetup Sample (Microsoft Visual Basic®)

Although DirectX samples include Microsoft Visual C++® project workspace files, you might need to verify other settings in your development environment to ensure that the samples compile properly. For more information, see *Compiling DirectX Samples and Other DirectX Applications*.

Dinstall Sample

[Visual Basic]

This section pertains only to application development in C++. For information about application development in Microsoft® Visual Basic®, see the DXVBSetup Sample.

[C++]

Description

Dinstall is an example of how to use Microsoft® DirectSetup® functions to install the Microsoft DirectX® subsystem. It shows how to use a callback function to present messages and get user input through a custom interface, in this case a simple modeless dialog box.

Path

Source: *(SDK root)\Samples\Multimedia\Misc\DXInstall*

User's Guide

1. Copy the entire contents of the \Redist\DirectX8 folder from the DirectX SDK CD into the same folder as Dinstall.exe.
2. In your development environment, set the working directory to this folder as well. (In Microsoft Visual C++®, this setting is on the **Debug** page of the **Project Settings** dialog box.)
3. Run the program and, on the **File** menu, click **Start Install**. DirectSetup performs a simulated installation of DirectX (see Programming Notes below) and advises you of its progress in a modeless dialog box. You can use the **Options** menu to change the level of messages shown. However, if you are performing only a simulated installation, you will never see problem or update messages.
4. On the **File** menu, click **GET Version**. The program shows the version and revision number of DirectX currently installed on the system.

Programming Notes

By default, the program passes DSETUP_TESTINSTALL to the **DirectXSetup** function. This means that no files are copied and the registry is not modified. To perform a real installation, delete this flag from the call.

Dinstall employs a callback function to monitor the progress of installation and intercept messages. Depending on the user's preferred warning level, as tracked in *g_fStatus*, messages may be ignored or presented to the user in a modeless dialog box. If user input is required, the appropriate buttons are displayed and the GetReply function monitors the message queue until one of the buttons is pressed.

DXVBSetup Sample

[C++]

This section pertains only to application development in Microsoft® Visual Basic®. See Dinstall Sample.

[Visual Basic]

Description

The DXVBSetup sample shows how Microsoft® DirectSetup® can be used by a Microsoft Visual Basic® application.

Path

(SDK root)\Samples\Multimedia\VBSamples\Misc\DXSetup

User's Guide

The setup application directory should have a subfolder called Setup containing Dsetup.dll and Dsetup32.dll. It must also have a folder named "DirectX" (this name is not case sensitive) containing all the redistributable files and drivers. To create the proper structure on your application setup disc, copy the entire contents of the \Redist\DirectX8 folder on the Microsoft DirectX® SDK disc into the root path of your setup program. Note that because this folder was not copied to your development computer when you installed the SDK, you have to get it from the original disc.
