
# Microsoft Windows Server Update Services 3.0 Operations Guide

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## Abstract

This paper documents the major tasks involved in administering and troubleshooting Microsoft® Windows Server™ Update Services 3.0.

Microsoft

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# Microsoft Windows Server Update Services 3.0 Operations Guide

This guide describes the major tasks involved in administering and troubleshooting Windows Server Update Services.

**Note**

A downloadable copy of this document is available at the Download Center (http://go.microsoft.com/fwlink/?LinkId=86697).

**In this guide**



# Administering Windows Server Update Services 3.0

This section contains background information and procedures for performing the major tasks involved in administering Windows Server Update Services 3.0.

**In this guide**

# Overview of Windows Server Update Services 3.0

You can use Windows Server Update Services (WSUS) 3.0 to manage downloading software updates from Microsoft Update and distributing them to computers in your network.

## How WSUS works

WSUS provides a management infrastructure consisting of the following:

- **Microsoft Update**: the Microsoft Web site that distributes updates to Microsoft products.
- **Windows Server Update Services server**: the server component that is installed on a computer running Microsoft® Windows® Server 2003 operating system inside the corporate firewall. WSUS server software enables administrators to manage and distribute updates through an administrative console, which can be used to manage any WSUS server in any domain with which it has a trust relationship. A WSUS server can obtain updates either from Microsoft Update or from another WSUS server, but at least one WSUS server in the network must connect to Microsoft Update to get available updates. The administrator can decide how many WSUS servers should connect directly to Microsoft Update, based on network configuration, bandwidth, and security considerations. These servers can then distribute updates to other downstream WSUS servers.
- **Automatic Updates**: the client computer component built into Windows operating systems. Automatic Updates enables both server and client computers to receive updates either from Microsoft Update or from a WSUS server.

### Software updates

Software updates consist of two parts:

- Update files: the actual files that are installed on client computers.
- Update metadata: the information needed to perform the installation, which includes:
  - Update properties (title, description, Knowledge Base article, Microsoft Security Response Center number).
  - Applicability rules (used by Automatic Updates to determine whether or not the update is needed on a particular computer).
  - Installation information (command-line options to apply when installing the updates).

The two parts of the update can be downloaded independently of each other. For example, if you choose not to store updates locally, only update metadata (and any applicable Microsoft Software License Terms) will be downloaded to the WSUS server; clients will get their update files directly from Microsoft Update. On the other hand, if you are storing updates locally on the WSUS server, you can either download everything at the time of synchronization, or download only the metadata during the synchronization, leaving the actual update files to be downloaded after you have approved the update.

# Managing Windows Server Update Services 3.0

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# Setting Up Synchronizations

During synchronization, your WSUS server downloads updates (update metadata and files) from an update source. It also downloads new product classifications and categories, if any. When your WSUS server synchronizes for the first time, it will

download all of the updates you specified when you configured synchronization options. After the first synchronization, your WSUS server downloads only updates from the update source, as well as revisions in metadata for existing updates and expirations to updates.

**Note**

The first time a WSUS server downloads updates may take a long time. If you are setting up multiple WSUS servers, you can speed up the process to a certain extent by downloading all the updates on one WSUS server and then copying the updates to the content directories of the other WSUS servers. Update metadata must be downloaded separately to each server during synchronization.

The **Options** page is the central access point in the WSUS administration console for customizing how your WSUS server synchronizes updates. You can specify which updates are synchronized automatically, where your server gets updates, connection settings, and the synchronization schedule. You can also use the Configuration Wizard from the **Options** page to configure or reconfigure your WSUS server at any time.

# Synchronizing updates by product and classification

Your WSUS server downloads updates based on the products or product families (for example, Windows, or Windows Server 2003, Datacenter Edition) and classifications (for example, critical updates or security updates) that you specify. At the first synchronization, your WSUS server downloads all of the updates available in the categories you have specified. In later synchronizations your WSUS server downloads only the newest updates (or changes to the updates already available on your WSUS server) for the categories you specified.

You specify update products and classifications on the **Options** page under **Products and Classifications**. Products are listed in a hierarchy, grouped by product family. If you select Windows, you automatically select every product that falls under that product hierarchy. By selecting the parent check box you select all items under it, as well as all future versions. Selecting the child check boxes will not select the parent check boxes. The default setting for products is all Windows products, and the default setting for classifications is critical and security updates.

If your WSUS server is running in replica mode, you will not be able to perform this task. For more information about replica mode, see Running WSUS 3.0 in Replica Mode.

**To specify update products and classifications for synchronization**

1. In the WSUS administrative console, click the **Options** node.
2. Click **Products and Classifications**, and then click the **Products** tab.
3. Select the check boxes of the products or product families you want to update with WSUS, and then click **OK**.
4. In the **Classifications** tab, select the check boxes of the update classifications you want your WSUS server to synchronize, and then click **OK**.

**Note**

You can remove products or classifications in the same way. Your WSUS server will stop synchronizing new updates for the products you have cleared. However, updates that were synchronized for those products before you cleared them will remain on your WSUS server and will be listed as available. For more information about removing unused updates, see the section "The local directory is running out of disk space" in Issues with Update Storage.

# Synchronizing updates by language

Your WSUS server downloads updates based on the languages that you specify. You can synchronize updates in all of the languages in which they are available, or you can specify a subset of languages. If you have a hierarchy of WSUS servers, and you need to download updates in different languages, make sure that you have specified all the necessary languages on the upstream server. On a downstream server you can specify a subset of the languages you specified on the upstream server.

# Configuring proxy-server settings

You can configure your WSUS server to use a proxy server during synchronization with an upstream server or Microsoft Update. This setting will apply only when your WSUS server runs synchronizations. By default your WSUS server will try to connect directly to the upstream server or Microsoft Update.

**To specify a proxy server for synchronization**

1. In the WSUS administrative console, click **Options**, and then click **Update Source and Proxy Server**.
2. On the **Proxy Server** tab, select the **Use a proxy server when synchronizing** check box, and then type the server name and port number (port 80 is the

default) of the proxy server.

- If you want to connect to the proxy server with specific user credentials, select the **Use user credentials to connect to the proxy server** check box, and then enter the user name, domain, and password of the user in the corresponding boxes.
- If you want to enable basic authentication for the user connecting to the proxy server, select the **Allow basic authentication (password is sent in cleartext)** check box.

3. Click **OK**.

**Note**

Because WSUS initiates all of its network traffic, there is no need to configure Windows Firewall on a WSUS server connected directly to Microsoft update.

# Configuring the update source

The update source is the location from which your WSUS server gets its updates and update metadata. You can specify that the update source should be either Microsoft Update or another WSUS server (the WSUS server that acts as the update source is the *upstream server*, and your server is the *downstream server*).

Options for customizing how your WSUS server synchronizes with the update source include the following:

- You can specify a custom port for synchronization. For general information about configuring ports, see Deploying Microsoft Windows Server Update Services (http://go.microsoft.com/fwlink/?linkid=79983).
- You can use Secure Socket Layers (SSL) to secure synchronization of update information between WSUS servers. For more information about using SSL, see Securing Windows Server Update Services 3.0.

**To specify the update source for your WSUS server**

1. In the WSUS administrative console, click **Options**, and then click **Update Source and Proxy Server**.
2. On the **Update Source** tab, do one of the following:
   - If you want your WSUS server to synchronize directly from Microsoft Update, click **Synchronize from Microsoft Update**. If your server is running in replica mode, this option is disabled. For more information, see Running

WSUS 3.0 in Replica Mode.

- If you want to synchronize from another WSUS server in your network, click **Synchronize from an upstream Windows Server Update Services server**, and then type the server name and port number in the corresponding boxes.
- If you want to use SSL when synchronizing, type the port number that the upstream server uses for SSL connections, and then select the **Use SSL when synchronizing update information** check box. For more information about using SSL during synchronization, see Securing Windows Server Update Services 3.0.
- If your WSUS server is running in replica mode, type the server name and port number in the **Server name** box. The upstream server does not have to be the administration server (for example, it can be another replica mode server). For more information about replica mode, see Running WSUS 3.0 in Replica Mode.

3. Click **OK**.

# Configuring update storage

For more information, see Specifying Where to Store the Updates.

# Synchronizing manually or automatically

You can either synchronize your WSUS server manually or specify a time for it to synchronize automatically.

**To synchronize your server manually**

1. In the WSUS administrative console, click **Options**, and then click **Synchronization Schedule**.
2. Click **Synchronize manually**, and then click **OK**.

**To set up an automatic synchronization schedule**

1. In the WSUS administrative console, click **Options**, then **Synchronization Schedule**.
2. Click **Synchronize automatically**.

3. For **First synchronization**, select the time you want synchronization to start each day.
4. For **Synchronizations per day**, select the number of synchronizations you want to do each day. For example, if you want four synchronizations a day starting at 3:00 A.M., then synchronizations will occur at 3:00 A.M., 9:00 A.M., 3:00 P.M., and 9:00 P.M. each day. (A random time offset will be added to the scheduled synchronization time in order to space out the server connections to Microsoft Update.)
5. Click **OK**.

**To synchronize your WSUS server immediately**

1. On the WSUS administrative console, select the top server node.
2. In the **Overview** pane, under **Synchronization Status**, click **Synchronize now**.

# Managing the Client Computers and Computer Groups

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# Managing the Client Computers

The central access point in the WSUS administrative console for managing computers is the **Computers** node. Under this node you can find the different groups you have set up (plus the default group, Unassigned Computers). Selecting one of the computer groups causes the computers in that group to be displayed in the **Details** pane. (If a computer is assigned to multiple groups, it will appear in the listings of both groups.) If you select a computer in the list, you can see its properties, which include general details about the computer and the status of updates for it, such as the installation or detection status of an update for a particular computer. You can filter the list of computers under a given computer group by status. The default shows only computers for which updates are

needed or which have had installation failures; however, you can filter the display by any status. Click **Refresh** after changing the status filter.

You can also manage computer groups on the **Computers** page, which includes creating the groups and assigning computers to them. For more information about managing computer groups, see Managing the Computer Groups.

**Important**

You must first configure client computers to contact the WSUS server before you can manage them from that server. Until you perform this task, your WSUS server will not recognize your client computers and they will not be displayed in the list on the **Computers** page. For more information about setting up client computers, see Deploying Microsoft Windows Server Update Services (http://go.microsoft.com/fwlink/?LinkId=79983).

# Managing the Computer Groups

WSUS allows you to target updates to groups of client computers, so you can ensure that specific computers always get the right updates at the most convenient times. For example, if all the computers in one department (such as the Accounting team) have a specific configuration, you can set up a group for that team, decide which updates their computers need and what time they should be installed, and then use WSUS reports to evaluate the updates for the team.

Computers are always assigned to the **All Computers** group, and remain assigned to the **Unassigned Computers** group until you assign them to another group. Computers can belong to more than one group.

Computer groups can be set up in hierarchies (for example, the Payroll group and the Accounts Payable group below the Accounting group). Updates that are approved for a higher group will automatically be deployed to lower groups, as well as to the higher group itself. Thus, if you approve Update1 for the Accounting group, the update will be deployed to all the computers in the Accounting group, all the computers in the Payroll group, and all the computers in the Accounts Payable group.

Because computers can be assigned to multiple groups, it is possible for a single update to be approved more than once for the same computer. However, the update will be deployed only once, and any conflicts will be resolved by the WSUS server. To continue with the example above, if ComputerA is assigned to both the Payroll and the Accounts Payable groups, and Update1 is approved for both groups, it will be deployed only once.

You can assign computers to computer groups by using one of two methods, *server-side targeting* or *client-side targeting*. With server-side targeting, you manually move one or more client computers to one computer group at a time. With client-side targeting, you use Group Policy or edit the registry settings on client computers to enable those computers to automatically add themselves into the previously created computer groups. This process can be scripted and deployed to many computers at once. You must specify the targeting method you will use on the WSUS server by selecting one of the two options on the **Computers** section of the **Options** page.

**Note**

If a WSUS server is running in replica mode, computer groups cannot be created on that server. All the computer groups needed for clients of the replica server must be created on the WSUS server that is the root of the WSUS server hierarchy. For more information about replica mode, see Running WSUS 3.0 in Replica Mode.

For more information about server-side and client-side targeting, see Deploying Microsoft Windows Server Update Services (http://go.microsoft.com/fwlink/?linkid=79983).

# Managing the Updates

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- Overview of Updates
- Viewing the Updates
- WSUS 3.0 and the Catalog Site
- Approving the Updates
- Testing the Updates
- Storing the Updates

# Overview of Updates

Updates are used for updating or providing a full file replacement for software that is installed on a computer. Every update that is available on Microsoft Update is made up of two components:

- **Metadata**: Provides information about the update. For example, metadata supplies information for the properties of an update, thus enabling you to find out for what the update is useful. Metadata also includes Microsoft Software License Terms. The metadata package downloaded for an update is typically much smaller than the actual update file package.
- **Update files**: The actual files required to install an update on a computer.

# How WSUS stores updates

When updates are synchronized to your WSUS server, the metadata and update files are stored in two separate locations. Metadata is stored in the WSUS database. Update files can be stored either on your WSUS server or on Microsoft Update servers, depending on how you have configured your synchronization options. If you choose to store update files on Microsoft Update servers, only metadata is downloaded at the time of synchronization; you approve the updates through the WSUS console, and then client computers get the update files directly from Microsoft Update at the time of installation. For more information about your options for storing updates, see Deploying Microsoft Windows Server Update Services (http://go.microsoft.com/fwlink/?LinkId=79983).

# Managing updates with WSUS

You will be setting up and running synchronizations, adding computers and computer groups, and deploying updates on a regular basis. The following list gives examples of general tasks you might undertake in updating computers with WSUS.

1. Determine an overall update management plan based on your network topology and bandwidth, company needs, and organizational structure. Considerations might include the following:
    - Whether to set up a hierarchy of WSUS servers, and how the hierarchy should be structured.
    - Which database to use for update metadata (for example, Windows® Internal Database, SQL Server 2005).
    - What computer groups to create, and how to assign computers to them (server-side or client-side targeting).
    - Whether updates should be synchronized automatically, and at what time.

2. Set synchronization options, such as update source, product and update classification, language, connection settings, storage location, and synchronization schedule.
3. Get the updates and associated metadata on your WSUS server through synchronization from either Microsoft Update or an upstream WSUS server.
4. Approve or decline updates. You have the option of allowing users to install the updates themselves (if they are local administrators on their client computers).
5. Configure automatic approvals. You can also configure whether you want to enable automatic approval of revisions to existing updates or approve revisions manually. If you choose to approve revisions manually, then your WSUS server will continue using the older version until you manually approve the new revision.
6. Check the status of updates. You can view update status, print a status report, or configure e-mail for regular status reports.

# Update products and classifications

Updates available on Microsoft Update are differentiated by product (or product family) and classification.

## Products updated by WSUS

A *product* is a specific edition of an operating system or application, for example Microsoft Windows Server 2003. A *product family* is the base operating system or application from which the individual products are derived. An example of a product family is Microsoft Windows, of which Microsoft Windows Server 2003 is a member. You can select the products or product families for which you want your server to synchronize updates. You can specify a product family or individual products within the family. Selecting any product or product family will get updates for current and future versions of the product.

## Update classifications

Update classifications represent the type of update. For any given product or product family, updates could be available among multiple update classifications (for example, Windows XP family Critical Updates and Security Updates). The following table lists update classifications.

| Update classification | Description |
|---|---|
| Critical updates | Broadly released fixes for specific problems addressing critical, non-security related bugs. |
| Definition updates | Updates to virus or other definition files. |
| Development kits | Software to aid the writing of new applications. |
| Drivers | Software components designed to support new hardware. |
| Feature packs | New feature releases, usually rolled into products at the next release. |
| Security updates | Broadly released fixes for specific products, addressing security issues. |
| Service packs | Cumulative sets of all hotfixes, security updates, critical updates, and updates created since the release of the product. Service packs might also contain a limited number of customer-requested design changes or features. |
| Tools | Utilities or features that aid in accomplishing a task or set of tasks. |
| Update rollups | Cumulative set of hotfixes, security updates, critical updates, and updates packaged together for easy deployment. A rollup generally targets a specific area, such as security, or a specific component, such as Internet Information Services (IIS). |
| Updates | Broadly released fixes for specific problems addressing non-critical, non-security related bugs. |

# Viewing the Updates

On the **Updates** page, you can do the following:

- View updates. The update overview displays updates that have been synchronized from the update source to your WSUS server and are available for approval.
- Filter updates. In the default view you can filter updates by approval status and installation status. The default setting is for unapproved updates that are needed by some clients or that have had installation failures on some clients. You can change this view by changing the approval status and installation status filters, and then clicking **Refresh**.
- Create new update views. In the Actions pane, click **New Update View**. You can filter updates by classification, product, the group for which they have been approved, and synchronization date. You can sort the list by clicking the appropriate column heading in the title bar.
- Search for updates. You can search for an individual update or set of updates by title, description, Knowledge Base article, or the Microsoft Security Response Center number for the update.
- View details, status, and revision history for each update.
- Approve updates.
- Decline updates.

### To view updates

1. In the WSUS administration console, expand the **Updates** node, and then click **All Updates**.
2. By default, updates are displayed with their title, classification, installed/not applicable percentage, and approval status. If you wish to display more or different update properties, right-click the column heading bar and select the appropriate columns.
3. To sort by different criteria, such as download status, title, classification, release date, or approval status, click the appropriate column heading.

### To filter the list of updates displayed on the Updates page

1. In the WSUS administration console, expand the **Updates** node, and then click **All Updates**.

2. In the center pane next to **Approval**, select the desired approval status, and next to **Status** select the desired installation status. Click **Refresh**.

**To create a new update view**

1. In the WSUS administration console, expand the **Updates** node, and then click **All Updates**.
2. In the Actions pane, click **New Update View**.
3. In the **Add Update View** window, under **Step 1: Select properties**, select the properties you need to filter the update view:
   - Select **Updates are in a specific classification** to filter on updates belonging to one or more update classifications.
   - Select **Updates are for a specific product** to filter on updates for one or more products or product families.
   - Select **Updates are approved for a specific group** to filter on updates approved for one or more computer groups.
   - Select **Updates were synchronized within a specific time period** to filter on updates synchronized at a specific time.
   - Select **Updates are WSUS updates** to filter on WSUS updates.
4. Under **Step 2: Edit the properties**, click the underlined words to pick the values you want.
5. Under **Step 3: Specify a name**, give your new view a name.
6. Click **OK**.
7. Your new view will appear in the tree view pane under **Updates**. It will be displayed, like the standard views, in the center pane when you select it.

**To search for an update**

1. Select the **Updates** node (or any node under it).
2. In the Actions pane, click **Search**.
3. In the Search window, on the **Updates** tab, enter your search criteria. You can use text from the **Title**, **Description**, and **Microsoft Knowledge Base (KB) article number** fields. Each of these items is a property listed on the **Details** tab in the update properties.

**To view the properties for an update**

1. In the WSUS administration console, expand the **Updates** node, and then click **All Updates**.
2. In the list of updates, click the update you want to view.
3. In the lower pane, you will see the different property sections:
   - The title bar displays the title of the update; for example, **Security Update for Windows Media Player 9 (KB911565)**.
   - The **Status** section displays the installation status of the update (the computers on which it needs to be installed, computers on which it was installed with errors, computers on which it has been installed or is not applicable, and computers that have not reported status for the update), as well as general information (KB and MSRC numbers release date, etc.).
   - The **Description** section displays a brief description of the update.
   - The **Additional Details** section displays the following information:

   a. The installation behavior of the update (whether or not it is removable, requests a restart, requires user input, or must be installed exclusively)

   b. Whether or not the update has Microsoft Software License Terms

   c. The products to which the update applies

   d. The updates that supersede this update

   e. The updates that are superseded by this update

   f. The languages supported by the update

   g. The update ID

**Note**

You can perform this procedure on only one update at a time. If you select multiple updates, the first update in the list will be displayed in the **Properties** pane.

# WSUS 3.0 and the Catalog Site

The catalog site is the Microsoft location from which you can import hotfixes and hardware drivers.

# Importing hotfixes from the Microsoft Update catalog site

In order to import hotfixes into WSUS, you must access the Microsoft Update catalog site from a WSUS computer.

**Note**

Any computer that has the WSUS administrative console installed, whether or not it is a WSUS server, can be used to import hotfixes from the catalog site. You must be logged on to the computer as an administrator to import the hotfixes.

**To access the Microsoft Update catalog site**

1. In the WSUS administrative console, select either the top server node or the **Updates** node, and in the **Actions** pane click **Import Updates**.
2. A browser window will open at the Microsoft Update Catalog Web site.
3. In order to access the updates at this site, you must install the Microsoft Update Catalog ActiveX control.
4. You can browse this site for Windows hotfixes and hardware drivers. When you have found the ones you want, add them to your basket.
5. When you have finished browsing, go to the basket and click **Import** to import your updates. To download the updates without importing them, clear the **Import directly into Windows Server Update Services** checkbox.

# Restricting access to hotfixes

WSUS administrators should use the following steps to restrict access to the hotfixes they have downloaded from the Microsoft Update catalog site.

**To restrict access to hotfixes**

1. Enable Windows authentication on the IIS Content vroot.
   - Start **IIS Manager** (click **Start**, then **Administrative Tools**, and then **Internet Information Services (IIS) Manager**).
   - Navigate to the Content node of the WSUS Web site.
   - Click **Properties** and open the **Directory Security** tab.
   - Under **Authentication and access control**, click **Edit**.

- In the **Authentication Methods** screen, clear the **Enable anonymous access** checkbox and select the **Integrated Windows authentication** check box.

2. Create a WSUS target group for the computers that need the hotfix, and add them to the group. For more information about computers and groups, see Managing the Client Computers and Computer Groups.
3. Download the files for the hotfix.
4. Set the permissions of these files so that only machine accounts of those machines can read them. You will also need to allow the Network Service account full access to the files
5. Approve the hotfix for the WSUS target group created in Step 2.

### Importing updates in different languages

The Microsoft Update Catalog Web site includes updates that support multiple languages. It is very important to match the languages supported by the WSUS server with the languages supported by these updates. If the WSUS server does not support all the languages included in the update, the update will not be deployed to client computers. Likewise, if an update supporting multiple languages has been downloaded to the WSUS server but not yet deployed to client computers, and an administrator deselects one of the languages included the update, the update will not be deployed to the clients.

## Approving the Updates

After updates have been synchronized to your WSUS server, they will be scanned automatically for relevance to the server's client computers. However, you must approve the updates manually before they are deployed to the computers on your network. When you approve an update, you are essentially telling WSUS what to do with it (your choices are **Install** or **Decline** for a new update). You can approve updates for the **All Computers** group or for subgroups. If you do not approve an update, its approval status remains **Not approved**, and your WSUS server allows clients to evaluate whether or not they need the update.

If your WSUS server is running in replica mode, you will not be able to approve updates on your WSUS server. For more information about replica mode, see Running WSUS 3.0 in Replica Mode.

# Approving updates

You can approve the installation of updates for all the computers in your WSUS network or for different computer groups. After approving an update, you can do one (or more) of the following:

- Apply this approval to child groups, if any.
- Set a deadline for automatic installation. When you select this option, you set specific times and dates to install updates, overriding any settings on the client computers. In addition, you can specify a past date for the deadline if you want to approve an update immediately (to be installed the next time client computers contact the WSUS server).
- Remove an installed update if that update supports removal.

**Important**

You cannot set a deadline for automatic installation for an update if user input is required (for example, specifying a setting relevant to the update). To determine whether an update will require user input, look at the **May request user input** field in the update properties for an update displayed on the **Updates** page. Also check for a message in the **Approve Updates** box that says, "**The selected update requires user input and does not support an installation deadline**."

**Important**

If there are updates to the WSUS server component, you cannot approve other updates to client systems until the WSUS update is approved. You will see this warning message in the Approve Updates dialog box: "There are WSUS updates that have not been approved. You should approve the WSUS updates before approving this update." In this case, you should click the WSUS Updates node and make sure that all of the updates in that view have been approved before returning to the general updates.

**To approve updates**

1. In the WSUS administrative console, click **Updates**.
2. In the list of updates, select one or more updates that you want to approve and right-click (or go to the **Actions** pane).
3. In the **Approve Updates** dialog box, select the computer group for which you want to approve the update, and click the arrow next to it.
4. Select **Approved for Install**, and then click **Approve**.

5. The **Approval Progress** window will display the progress toward completing the approval. When the process is complete, the **Close** button will be available. Click **Close**.
6. You may select a deadline by right-clicking the update, selecting the appropriate computer group, clicking the arrow next to it, and then clicking **Deadline**.
    - You may select one of the standard deadlines (one week, two weeks, one month), or you may click **Custom** to specify a date and time.
    - If you want an update to be installed as soon as the client computers contact the server, click **Custom**, and set a date and time to the current date and time or to one in the past.

**Note**

For more information about downloading and installing updates, see Best Practices with Windows Server Update Services 3.0.

# Declining updates

If you select this option, the update is removed from the default list of available updates and the WSUS server will not offer the update to clients, either for evaluation or installation. You can reach this option by selecting an update or group of updates and right-clicking or going to the Actions pane. Declined updates will appear in the updates list only if you select **Declined** in the Approval list when specifying the filter for the update list under **View**.

**To decline updates**

1. In the WSUS administrative console, click **Updates**.
2. In the list of updates, select one or more updates that you want to decline.
3. Select **Decline**.
4. Click **Yes** on the confirmation message.

# Unapproving updates

If an update has been approved and you decide not to install it at this time but want to save it for a future time, you can unapprove the update. This means that the update will remain in the default list of available updates and will report client compliance, but will not be installed on clients.

**To unapprove updates**

1. In the WSUS administrative console, click **Updates**.
2. In the list of updates, select one or more updates that you wish to unapprove. (The updates must have been approved.)
3. In the shortcut menu or the **Actions** pane, select **Not Approved**.
4. Click **Yes** on the confirmation message.

# Approving updates for removal

You can approve an update for removal (that is, to uninstall an already-installed update). This option is available only if the update is already installed and supports removal. You can specify a deadline for the update to be uninstalled, or specify a past date for the deadline if you want to remove the update immediately (the next time client computers contact the WSUS server).

**Note**

Not all updates support removal. You can see whether an update supports removal by selecting an individual update and looking at the **Details** pane. Under **Additional Details**, you will see the **Removable** category. If the update cannot be removed through WSUS, in many cases it can be removed with **Add or Remove Programs** from **Control Panel**.

**To approve updates for removal**

1. In the WSUS administrative console, click **Updates**.
2. In the list of updates, select one or more updates that you want to approve for removal and right-click them (or go to the **Actions** pane).
3. In the **Approve Updates** dialog box, select the computer group from which you want to remove the update, and click the arrow next to it.
4. Select **Approved for Removal**, and then click the **Remove** button.
5. After the remove approval has completed, you may select a deadline by right-clicking the update once more, selecting the appropriate computer group, and clicking the arrow next to it. Then select **Deadline**.
    - You may select one of the standard deadlines (one week, two weeks, one month), or you may click **Custom** to select a specific date and time.
6. If you want an update to be removed as soon as the client computers contact the

server, click **Custom**, and set a date in the past.

# Approving updates automatically

You can configure your WSUS server for automatic approval of certain updates. You can also specify automatic approval of revisions to existing updates as they become available. This option is selected by default. A revision is a version of an update that has had changes made to it (for example, it might have expired, or its applicability rules might have changed). If you do not choose to approve the revised version of an update automatically, WSUS will use the older version, and you must manually approve the update revision.

You can create a rule that your WSUS server will automatically apply during synchronization. You specify what updates you want to automatically approve for installation, by update classification and by computer group. This applies only to new updates, as opposed to revised updates. This setting is available in the **Options** pane, under **Automatic Approvals**.

**To automatically approve updates**

1. In the WSUS administration console, click **Options**, and then click **Automatic Approvals**.
2. In **Update Rules**, click **New Rule**.
3. In the **Add Rule** dialog box, under **Step 1: Select properties**, select whether to use update classifications or products (or both) as criteria.
4. In **Step 2: Edit the properties**, click the underlined properties to select the values for which you want automatic approvals.
5. In **Step 3: Specify a name**, give a name to the rule.
6. Click **OK**.

**Note**

Automatic approval rules will not apply to updates requiring an End User License Agreement (EULA) that has not yet been accepted on the server. If you find that applying an automatic approval rule does not cause all the relevant updates to be approved, you should approve these updates manually.

# Automatically approving revisions to updates and declining expired updates

The **Automatic Approvals** section of the **Options** pane contains a default option to automatically approve revisions to approved updates. You can also set your WSUS server to automatically decline expired updates. If you choose not to approve the revised version of an update automatically, your WSUS server will use the older revision, and you must manually approve the update revision.

**Note**

A revision is a version of an update that has changed (for example, it might have expired or have updated applicability rules).

**To automatically approve revisions to updates and decline expired updates**

1. In the WSUS administration console, click **Options**, and then click **Automatic Approvals**.
2. On the **Advanced** tab, make sure that both **Automatically approve new revisions of approved updates** and **Automatically decline updates when a new revision causes them to expire** check boxes are selected.
3. Click **OK**.

**Important**

Keeping the default values for these options allows you maintain good performance on your WSUS network. If you do not wish expired updates to be declined automatically, you should make sure to decline them manually on a periodic basis.

# Approving superseding or superseded updates

Typically, an update that *supersedes* other updates does one or more of the following:

- Enhances, improves, or adds to the fix provided by one or more previously released updates.
- Improves the efficiency of its update file package, which is installed on client computers if the update is approved for installation. For example, the superseded update might contain files that are no longer relevant to the fix or to the operating

systems now supported by the new update, so those files are not included in the superseding update's file package.

- Updates newer versions of operating systems. It is also important to note that the superseding update might not support earlier versions of operating systems.

Conversely, an update that is *superseded* by another update does the following:

- Fixes a problem similar to that of the update that supersedes it. However, the update that supersedes it might enhance the fix that the superseded update provides.
- Updates earlier versions of operating systems. In some cases, these versions of operating systems are no longer updated by the superseding update.

In an individual update's detail pane, an informational icon and a message at the top indicates that it either supersedes or is superseded by another update. In addition, you can determine which updates supersede or are superseded by the update by looking at the **Updates superseding this update** and **Updates superseded by this update** entries in the Additional Details section of the Properties. An update's detail pane is displayed below the list of updates.

WSUS does not automatically decline superseded updates, and it is recommended that you do not assume that superseded updates should be declined in favor of the new, superseding update. Before declining a superseded update, make sure that it is no longer needed by any of your client computers. The following are examples of scenarios in which you might need to install a superseded update:

- If a superseding update supports only newer versions of an operating system, and some of your client computers run earlier versions of the operating system.
- If a superseding update has more restricted applicability than the update it supersedes, which would make it inappropriate for some client computers.
- If an update no longer supersedes a previously released update because of new changes. It is possible that through changes at each release, an update no longer supersedes an update it previously superseded in an earlier version. In this scenario, you will still see a message about the superseded update, even though the update that supersedes it has been replaced by an update that does not.

## Recommended process for approving a superseding update

Because a superseding update typically enhances a fix provided by a previously released update, it is recommended that you first see how many client computers will be compliant with the new update and work backward from there. Use the following process.

**To approve a superseding update**

1. Check the status of the update on client computers. Note which computers show status as **Not applicable** for the update, and then compare the properties of those computers with the properties of the update.
2. Use the information available in the update properties to help you determine which previously released versions are available. You can look under **Updates superseded by this update** in the update's properties, and check the **Description** and **KB article number** entries if appropriate.
3. Look at the properties of the superseded versions of the updates.
4. When you find a superseded update that seems appropriate for the remaining client computers, approve the update for installation.

# Office Update Approval

If you use WSUS to update Microsoft Office on your network computers, consider the following:

- You must use an original baseline source for Microsoft Office Administrative Install Points (AIP) to use WSUS to update Office XP and Office 2003 on client computers. If you are applying updates to the AIP, you cannot use WSUS. The two methods of applying updates are mutually exclusive. If you have applied an update to an AIP and want to roll back the AIP to an original baseline source, use the instructions found at the Microsoft Support Web site at http://go.microsoft.com/fwlink/?LinkId=63962.

**Important**

Administrative Install Points are relevant only to Office XP and Office 2003. They are not used with Office 2007.

- If you have purchased a "per user" license agreement for Office or have installed Office per user, WSUS will not update Office.
- Users can access the public Microsoft Office Online Web site to look for updates to their Office installation through the Microsoft Office Update wizard. Using Group Policy, you might want to create policies that prevent users from getting their own Office updates from Microsoft Office Online.

For more information and troubleshooting advice, see the following Knowledge Base articles.

- Office 2003 updates are offered to a user even if that user has installed those updates when you use WSUS to deploy software updates and hotfixes to computers that are in your organization (http://go.microsoft.com/fwlink/?LinkId=78874)
- No appropriate Microsoft Office updates are displayed when you use Microsoft Update or Windows Server Update Services (http://go.microsoft.com/fwlink/?LinkId=78871)
- How to change the source for a client computer from an updated administrative installation point to an Office 2003 original baseline source or Service Pack (http://go.microsoft.com/fwlink/?LinkId=78872)

# SQL Server and Exchange Server Updates Approval

## Updating Microsoft SQL Server instances

SQL Server installations can become quite complex, with multiple instances or even versions of SQL Server on a single computer. You will need to make sure that when you specify your synchronization options, you account for all the versions of the SQL Server you have on the computer. For more information about configuring synchronization options, see Setting Up Synchronizations.

## Updating Microsoft SQL Server and Microsoft Exchange Servers that are part of a cluster

Both Microsoft SQL Server and Microsoft Exchange Server can be installed in a *clustered environment*. If there is an update available for clustered servers, each server in the cluster must be updated individually. Microsoft recommends that you update passive cluster nodes individually. You will need to stop the cluster service for each server while you update it, and then restart the service.

**Note**

You can have both a stand-alone instance and a clustered instance of SQL Server on the same server. If you are updating a server that is running both a stand-alone instance and a clustered instance of SQL server, both SQL Server

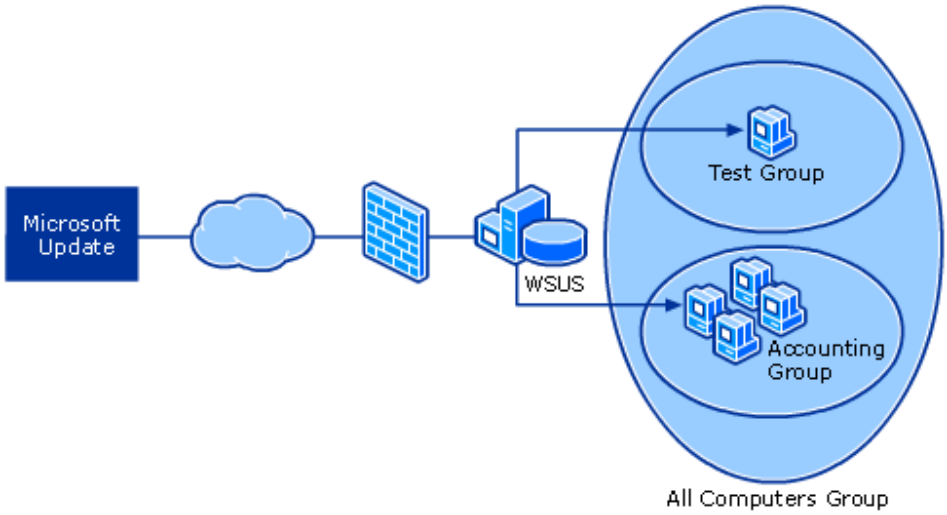
instances will be updated if you have specified the correct synchronization options.

# Testing the Updates

Until you install an update, you cannot be certain about the impact it will have on other programs running on your systems. By installing an update in a test environment, you can assess its impact before you decide whether or not to deploy it to your production systems. This approach can prevent unplanned downtime and lost productivity.

WSUS enables you to create custom computer groups that you can use to test updates. For example, the following figure depicts three computer groups: two custom groups created by the administrator (Test and Accounting), as well as the built-in All Computers group.

In this example, the Test group contains a small number of computers representative of the computers in the Accounting group. The administrator can first approve updates for the Test group. If the testing goes well, the administrator can roll out the updates to the Accounting group.




You can create multiple test computer groups with different configurations that resemble the computers in different departments in your organization.

# Storing the Updates

**In this section**



# Specifying Where to Store the Updates

You can specify whether to store update files on your local WSUS server or on Microsoft Update. If you store updates locally, you can limit the updates downloaded by language. If you store the update files on Microsoft Update, then your WSUS server will download only update metadata. Update files are downloaded to the client computers at the time of installation. If you choose this option, you will need to make sure all your client computers have direct access to Microsoft Update.

## Local storage considerations

If you decide to store update files on your server, the recommended minimum disk size is 30 GB. However, depending on your synchronization options (in particular, multiple update languages or express installation files), you might need more disk space. If you download updates in five languages, you will need approximately double the size of the content directory you would need for just one language.

If your disk gets full, you can move the update files to a different location. To do this you will need to run the **WSUSutil.exe** tool. For this procedure, see Managing WSUS 3.0 from the Command Line.

### About express installation files

Express installation files are usually many times larger than a regular update package. An express installation file package containing all the versions of the update for different computer configurations is downloaded to your WSUS server. However, when your client computers connect to the server, they will download only the changes in the update files that the update needs. You should select the express installation file option only in situations where you are less concerned with external bandwidth than internal bandwidth usage.

Besides bandwidth, another consideration when choosing to download express installation files, as mentioned earlier, is disk space. If you choose to download express installation files, they will take more disk space. Therefore, use a larger disk (more than 30 GB) if you select this option.

The option to download and store express installation files is in covered in step 3 in the following procedure.

**To specify where to store downloaded update files**

1. In the WSUS administrative console, click **Options**, and then click **Update Files and Languages**.
2. Click the **Update Files** tab.
3. Select whether to store update files locally or on Microsoft Update. If you decide to store update files on your server, you can also choose to download update files only when they are approved, or to download express installation files.
4. If you decide to store the files on the WSUS server, click the **Update Languages** tab, and then select whether to limit the updates downloaded to your WSUS server by language. You should limit the languages you download if you are going to store update files on your WSUS server.
5. Click **OK**.

**Note**

If your WSUS server is running in replica mode, you will not be able to perform this task. For more information about replica mode, see Running WSUS 3.0 in Replica Mode.

# Changing the location where you store update files locally

You might need to change your local update storage location if the disk becomes full or fails and the replacement disk uses a new drive letter.

You accomplish this move with the **movecontent** command of WSUSutil.exe, a command-line tool that can be found in the *WSUSInstallationDirectory* \Tools\ directory (where *WSUSInstallationDirectory* is the directory to which you installed WSUS.

WSUSUtil.exe can be run only on the WSUS server itself. Only members of the local Administrators group on the WSUS server can run WSUSutil.exe

You must create the new path for local WSUS update storage before moving the content. The **movecontent** command takes an optional **-skipcopy** parameter, which enables you to change the storage location without copying any files. For more information about WSUSutil.exe, see Managing WSUS 3.0 from the Command Line.

**To change the location of local WSUS update storage**

1. Open a command shell.
2. Navigate to the directory that contains WSUSutil.exe:

   **cd** *WSUSInstallationDirectory***\Tools**.
3. Type the following command:

   **wsusutil.exe movecontent** *contentpath logfile* [**-skipcopy**]

   For example, type:

   **wsusutil.exe movecontent D:\WSUS1\ D:\move.log**

   where **D:\WSUS1** is the new path for local WSUS update storage, and **D:\move.log** is the path to the log file.

**Note**

If you do not want to use WSUSutil.exe to change the location of local WSUS update storage, you can also use NTFS functionality to add a partition to the current location of local WSUS update storage. For more information about NTFS, see NTFS technical documentation (http://go.microsoft.com/fwlink/?LinkId=79488).

# Managing the Database

The WSUS database is configured during setup to store the following types of information:

- WSUS server configuration information
- Information about client computers, updates, and client interaction with updates
- Update metadata

Update metadata (the information about the update) is part of every update available on Microsoft Update. The update files are stored separately from the metadata, either on

Microsoft Update or on your WSUS server. For more information, see Specifying Where to Store the Updates.

Depending on your server and network configurations, you must use a Windows® Internal Database or SQL Server 2005 database for your WSUS installation (for more information about your database options when installing WSUS, see "Choose the Database Used for WSUS" in Deploying Microsoft Windows Server Update Services (http://go.microsoft.com/fwlink/?linkid=79983).

You may have to perform one or two special database tasks as part of regular operations. You should regularly back up the WSUS database. For more information, see Backing Up Windows Server Update Services 3.0. You should also re-index the database to improve its performance. For more information, see Appendix I: Database Maintenance. In addition, you may want to move WSUS data from a Windows Internal Database installation to a SQL Server 2005 installation.

**In this section**

- Migrating from Windows Internal Database to SQL Server 2005

# Migrating from Windows Internal Database to SQL Server 2005

This topic explains how to migrate the WSUS database (SUSDB) from a Windows Internal Database instance (installed by default during WSUS setup) to a full version of Microsoft SQL Server 2005.

## Reasons to migrate the WSUS database to SQL Server 2005

- If you chose to use Windows Internal Database as the WSUS database when you set up your WSUS server, you may want to upgrade the database engine to a full installation of SQL Server 2005. SQL Server 2005 allows you to administer the WSUS database through the Enterprise Manager.

# SQL Server 2005 database requirements

- WSUS requires SQL Server 2005 with Service Pack 1. If you use the full version of SQL Server, the database administrator should first verify that the nested triggers option is turned on before setting up the WSUS database.
- You cannot use SQL authentication. WSUS supports Windows authentication only. WSUS setup creates a database named SUSDB.

# Scenarios

The following scenarios are presented in this topic:

- Migrating the Windows Internal Database database to a SQL Server 2005 instance running on the WSUS server
- Migrating the Windows Internal Database database to a SQL Server 2005 instance running on another server (remote SQL)

## Migrating the WSUS database from a Windows Internal Database instance to a SQL Server 2005 instance running on the WSUS server

Use the following steps to migrate the WSUS database from a Windows Internal Database instance to a SQL Server 2005 instance.

1. Install SQL Server 2005 (with the **Server and Client Tools** option) and SQL Server 2005 Service Pack 1 or higher on your WSUS server.
2. Stop the **IIS Admin** service and the **Update Services** service:
    - Click **Start**, point to **Programs**, point to **Administrative Tools**, and then click **Services**.
    - Right-click **IIS Admin Service**, and then click **Stop**.
    - Right-click **Update Services**, and then click **Stop**.
3. Detach the WSUS database (**SUSDB**) from the Windows Internal Database instance. You will need to use the **sqlcmd** utility, which can be downloaded from Feature Pack for Microsoft SQL Server 2005 (http://go.microsoft.com/fwlink/?LinkId=70728). For more information about the **sqlcmd** utility, see sqlcmd Utility (http://go.microsoft.com/fwlink/?LinkId=81183).

```
sqlcmd -S np:\\.\pipe\MSSQL$MICROSOFT##SSEE\sql\query
use master
```

```
alter database SUSDB set single_user with rollback immediate
go
sp_detach_db 'SUSDB'
go
```

1. Attach **SUSDB** to the destination SQL instance.
    - Under the instance node, right-click **Databases**, select **Properties**, and then click **Attach**.
    - In the **Attach Databases** box, under **Databases to attach**, browse to the location of the susdb.mdf file (by default this is **C:\WSUS\UpdateServicesDbFiles** if you installed Windows Internal Database), and then click **OK**.
2. In the SUSDB database, add the login NT AUTHORITY\NETWORK SERVICE if necessary.
    - Right-click the database, select **Properties**, click **Permissions**, and then click **Add**.
    - In the **Select Logins or Roles** dialog box, type **NT AUTHORITY\NETWORK SERVICE**.
3. Edit the registry to point WSUS to the SQL instance that now holds SUSDB.
    - Click **Start**, click **Run**, type **regedit**, and then click **OK**.
    - Find the following key: **HKLM\SOFTWARE\Microsoft\UpdateServices\Server\Setup\SqlServerName**, and in the **Value** box, type **[ServerName]\[InstanceName]**,and then click **OK**. If the instance name is the default instance, then simply type **[ServerName].**
4. Open **Services** and then start the **IIS Admin** service and **Update Services** service.
    - Click **Start**, point to **Programs**, point to **Administrative Tools**, and then click **Services**.
    - Right-click **IIS Admin Service**, and then click **Start**.
    - Right-click **Update Services**, and then click **Start**.
5. Verify that the database migration has been successful by opening the WSUS administrative console (click **Start**, click **Administrative Tools**, and then click **Microsoft Windows Server Update Services 3.0)**..

**Note**

You might have to restart the server for these settings to take effect.

# Migrating the WSUS database from a Windows Internal Database instance to a SQL Server 2005 instance on a remote server

The goal of this scenario is to take the WSUS database (SUSDB) running in a Windows Internal Database instance on the WSUS server and move and upgrade it to a SQL Server 2005 instance running on a remote server. Only a full SQL Server 2005 database may be used in a remote SQL installation. Note that in each step, where appropriate, it is noted on which server you must perform the procedures.

## Remote SQL scenario limitations

- You cannot use a server configured as a domain controller for either the front end (FE) or the back end (BE) of the remote SQL pair.
- You cannot use a server running as a Terminal Services server for the front end of the remote SQL pair.
- You cannot use Windows Internal Database for database software on the back-end server.
- Both the front-end and the back-end servers must be joined to an Active Directory domain.

## Prerequisites

- FE starting configuration:
  - Windows Server 2003 Service Pack 1 or Windows Server "Longhorn" operating system
  - WSUS with Windows Internal Database
- BE starting configuration:
  - Windows Server 2003 Service Pack 1 or Windows Server "Longhorn" operating system
  - SQL Server 2005

**Step 1 [on FE]: Install Microsoft SQL Server 2005 with "Client Tools Only" option.**

This step will enable you to use the SQL Server Enterprise Manager on FE.

**Step 2 [on FE]: Stop the IIS Admin service and the Update Services service.**

- Click **Start**, point to **Programs**, point to **Administrative Tools**, and then click **Services**.
- Right-click **IIS Admin Service**, and then click **Stop**.
- Right-click **Update Services**, and then click **Stop**.

**Step 3 [on FE]: Detach the WSUS database.**

```
sqlcmd -S np:\\.\pipe\MSSQL$MICROSOFT##SSEE\sql\query
use master
alter database SUSDB set single_user with rollback immediate
go
sp_detach_db 'SUSDB'
go
```

**Step 4: Copy the SUSDB.mdf and SUSDB_log.ldf files from FE to BE.**

- In Step 2, you noted the folder location on FE where these files are stored. Copy the files to this folder on BE.

**Step 5 [on BE]: Attach the WSUS database to a SQL Server 2005 instance.**

- Attach **SUSDB** to the destination SQL instance.
- Under the instance node, right-click **Databases**, select **Properties**, and then click **Attach**.
- In the **Attach Databases** box, under **Databases to attach**, browse to the location of the susdb.mdf file (by default this is **C:\WSUS\UpdateServicesDbFiles** if you installed Windows Internal Database), and then click **OK**.

**Step 6 [on BE]: In the SUSDB database, add the login NT AUTHORITY\NETWORK SERVICE if necessary.**

- Right-click the database, select **Properties**, then click **Permissions**, then **Add**.
- In the **Select Logins or Roles** dialog box, type **NT AUTHORITY\NETWORK SERVICE**.

**Step 7 [on FE]: Configure the FE computer to use the database on the BE computer.**

In this step, you edit the registry to point WSUS to the destination SQL instance.

- Click **Start**, click **Run**, type **regedit**, and then click **OK**.

- Find the following key:
  **HKLM\SOFTWARE\Microsoft\UpdateServices\Server\Setup\SqlServerName**
- In the **Value** data box, type **[BEName]\[InstanceName]**, and then click **OK**. If the instance name is the default instance, then simply type **[BEName]**.

**Note** When typing [BEName], do not add the domain name before the name.

**Step 8 [on FE]: Start the IIS Admin service and the Update Services service.**

- Click **Start**, point to **Programs**, point to **Administrative Tools**, and then click **Services**.
- Right-click **IIS Admin Service**, and then click **Start**.
- Right-click **Update Services**, and then click **Start**.

**Step 9: Verify that the database migration was successful.**

Open the WSUS administrative console (click **Start**, click **Administrative Tools**, and then click **Microsoft Windows Server Update Services 3.0)**.

**Note**

You might need to restart FE in order for these settings to take effect.

For more information about the databases you can use with WSUS, see the following:

- In this guide, see **Managing the Databases**.
- In Deploying Microsoft Windows Server Update Services, see "Choose the Database Used for WSUS 3.0".
- In Deploying Microsoft Windows Server Update Services, see "Appendix B: Configure Remote SQL" for general information about setting up WSUS using a remote SQL Server 2005 server to host the WSUS database.

# Using the Server Cleanup Wizard

The Server Cleanup Wizard is integrated into the WSUS 3.0 UI, and can be used to help you manage your disk space. This wizard can do the following things:

1. Remove unused updates and update revisions

   The wizard will remove all updates and update revisions that have not been approved for thirty days or more.

2. Delete computers not contacting the server

   The wizard will delete all client computers that have not contacted the server in thirty days or more.

3. Delete unneeded update files

   The wizard will delete all update files that are not needed by updates or by downstream servers.

4. Decline expired updates

   The wizard will decline all updates that have been expired by Microsoft.

5. Decline superseded updates

   The wizard will decline all updates that meet all the following criteria:

   - The superseded update is not mandatory
   - The superseded update has been on the server for thirty days or more
   - The superseded update is not currently reported as needed by any client
   - The superseded update has not been explicitly deployed to a computer group for ninety days or more
   - The superseding update must be approved for install to a computer group

**Important**

If you choose to remove unneeded content with the Server Cleanup Wizard, all the private update files that you have downloaded from the Catalog Site will be removed as well. You will need to re-import these files after running the Server Cleanup Wizard.

# Running the Server Cleanup Wizard

**To run the Server Cleanup Wizard**

1. In the WSUS administration console, select **Options**, and then **Server Cleanup Wizard**.
2. By default this wizard will remove unneeded content and computers that have not contacted the server for 30 days or more. Select all possible options, and then click **Next**.
3. The wizard will begin the cleanup process, and will present a summary of its work when it is finished. Click **Finish** to complete the process.

In some cases, particularly if you run the Server Cleanup Wizard on a WSUS 3.0 server that has WSUS 2.0 downstream servers, you may see discrepancies in update metadata on upstream and downstream servers. If this is the case, you may solve your problem by running **iisreset** on the upstream server to refresh the Web cache.

# Running WSUS 3.0 in Replica Mode

A WSUS server running in replica mode inherits the update approvals and computer groups created on its parent WSUS administration server. You will typically have a single parent server with one or more downstream replica WSUS servers. You approve updates and create computer groups on the parent server, which the replica servers will then mirror.

You may now designate any WSUS server as a downstream replica at any time. In the WSUS administration console, select **Options**, then **Update Source and Proxy Server**, and on the **Update Source** tab, select the **Synchronize from another Windows Server Update Services server** check box, and then the **This server is a replica of the upstream server** check box.

You will be able to perform only limited administration capabilities on a WSUS replica server, which will primarily consist of:

- Adding and removing computers from computer groups

  A replica server inherits the computer groups that were created on the administration server. You must assign the replica server's client computers to the computer groups.
- Viewing available updates
- Monitoring update, synchronization, and computer status, and monitoring WSUS settings on the server

All standard WSUS reports are available on replica mode servers.

For more information about setting up and running in replica mode, see Deploying Microsoft Windows Server Update Services (http://go.microsoft.com/fwlink/?linkid=79983).

# Replica server synchronization

If you are setting up many replica servers to connect to a single upstream WSUS server, you should not schedule synchronization to run at the same time on each replica server. This practice will avoid sudden surges in bandwidth utilization.

If a replica server tries and fails to synchronize with the upstream server, it will retry the synchronization twice at approximately fifteen-minute intervals. If both retries fail, the replica server will run synchronization at the next scheduled time.

# Backing Up Windows Server Update Services 3.0

You should back up WSUS data and update content in order not to lose information about the state of your WSUS network. Update content can always be synchronized from Microsoft Update, but all WSUS information (administrative settings, computer groups and group membership, and the installation status of updates) is kept in the WSUS database. Moreover, re-synchronization can take a considerable amount of time.

Backing up WSUS involves backing up the following:

- The WSUS database, which contains:
  - Update metadata.
  - WSUS server configuration information.
  - Information about client computers, updates, and client interaction with updates.
- The folder where the update files are stored, if you are storing updates locally and not on Microsoft Update. By default, update files are stored in the \WSUS\WSUSContent folder on the largest partition of your WSUS server.
- The folder containing the WSUS repair path (by default, \WSUS\UpdateServicesPackage on the largest partition of your WSUS server). The repair path is the location of any .msi files used to repair locally published packages.

Although WSUS does not provide a built-in backup tool, you can use the Backup Utility that is available on all servers running Windows Server 2003 to back up and restore both the WSUS database and update file storage folder. The Backup Utility is also known as **Ntbackup.exe**. If you are using a full version of Microsoft SQL Server 2005 for your database, you should use SQL Server Enterprise Manager as an alternative to the Backup Utility. For more information about SQL Server Enterprise Manager, refer to your SQL Server documentation. For more information about database options and configurations for WSUS, see Deploying Microsoft Windows Server Update Services (http://go.microsoft.com/fwlink/?linkid=79983).

**To back up content and data**

1. On your WSUS server, click **Start**, and then click **Run**.
2. In the **Open** box, type *%windir%***system32\ntbackup.exe**, and then click **OK**.
3. In the Backup or Restore Wizard, click **Next**.
4. Verify that **Back up files and settings** is selected, and then click **Next**.
5. Click **Let me choose what to back up**, and then click **Next**.
6. Under **Items to back up**, check the WSUS folder (typically *%systemdrive%*\WSUS\), and then click **Next**.
7. Click the **Browse** button to choose a place to save your backup, type a name for the backup, and then click **Next**.
8. If you want to set additional specifications for your backup, including whether it will be an incremental backup, whether you want to verify the backup, set a recurring schedule for the backup, or other options, click **Advanced**, and then follow the instructions in the wizard.
9. When the wizard is finished, click **Finish**.
10. When the message appears that informs you that the backup is complete, click **Close**.

**To restore content and data**

1. On your WSUS server, click **Start**, and then click **Run**.
2. In the **Open** box, type *%windir%***system32\ntbackup.exe**, and then click **OK**.
3. In the Backup or Restore Wizard, click **Next**.
4. Click **Restore files and settings**, and then click **Next**.
5. In the **What to restore** dialog box, under **Items to restore**, expand the file that contains the WSUS folder (typically *%systemdrive%*\WSUS\), and then click **Next**.
6. If you want to set additional specifications for your restore, including whether you want to restore the files or folders to a different location, replace existing files, restore security settings, or specify other options, click **Advanced**, and then follow the instructions in the wizard.
7. When the wizard is finished, click **Finish**.
8. When the message appears that informs you that restoring is complete, click

**Close**.

**Important**

You should restore the backup file to only one WSUS server. The backed-up information includes the Server ID, so if you restore the same backup file to two or more WSUS servers there will be two or more WSUS servers with the same ID. If you attempt to roll up information from downstream servers with duplicate IDs to an upstream server, you will get information from only one of these downstream servers.

After restoring the WSUS database you must recycle the WSUS Application Pool in IIS, as described in the next procedure. This will ensure that the restored database will sync up correctly with IIS, through which you manage the WSUS Web site and Web services. For more information about application pools, see IIS Help. For more information about how WSUS is installed, see Deploying Microsoft Windows Server Update Services (http://go.microsoft.com/fwlink/?linkid=79983).

**To recycle the WSUS Application Pool in IIS**

1. Click **Start**, point to **Administrative Tools**, and then click **Internet Information Services (IIS) Manager**.
2. In the tree view, expand the tree under the WSUS server name, and then expand **Application Pools**.
3. Right-click **WSUSPool**, and then click **Recycle**.
4. Close **IIS Manager**.

If you store updates locally on the WSUS server, after restoring the WSUS database you should also reset it. This is done with the **wsusutil.exe** command-line utility, which ensures that every row of update metadata in the database is matched by the corresponding update files in the local storage location. If the utility does not find matching data, it will download the update files from Microsoft Update. For more information about the WSUS command-line utility, see Managing WSUS 3.0 from the Command Line.

**To reset update content**

1. Open a command shell.
2. Navigate to the WSUS tools directory at *WSUSInstallDir***Tools**.
3. Type the following command: **wsusutil reset**
4. Wait until the command returns, and close the command window.

# Best Practices with Windows Server Update Services 3.0

This section provides a list of best practices for managing updates with WSUS. There are four main sections: one on security practices, one on resource usage, one on setting up a WSUS network, and the last on miscellaneous best practices.

## Best practices for security

The following practices can help you secure your WSUS network.

1. Use the Secure Sockets Layer (SSL) for WSUS connections (server to server, server to client) on all computers that download updates via the Internet. For information about configuring SSL, see the "Securing WSUS with the Secure Sockets Layer" section of the Windows Server Update Services Deployment Guide (http://go.microsoft.com/fwlink/?LinkId=79983).
2. If you do not wish to use SSL, you can deploy Internet Protocol security (IPsec) on your network to secure network traffic. The Overview of IPsec Deployment page (http://go.microsoft.com/fwlink/?LinkId=45154) offers guidance about how to deploy IPsec in your environment.
3. Make sure that the WSUS server that downloads updates from Microsoft Update is secured behind a firewall, and allows access only to the domains needed by WSUS. For a description of these domains, see the "Configure the Firewall" section of the Windows Server Update Services Deployment Guide (http://go.microsoft.com/fwlink/?LinkId=79983).
4. Make sure that WSUS servers have only the file and folder permissions that are needed by WSUS. For a description of the necessary file and folder permissions, see the "Before You Begin" section of the Windows Server Update Services Deployment Guide (http://go.microsoft.com/fwlink/?LinkId=79983).
5. If a WSUS server is Internet-facing, its database should be located on a different computer that is not reachable from the Internet. For remote SQL Server installation, see "Appendix B: Configure Remote SQL" in the Windows Server Update Services Deployment Guide (http://go.microsoft.com/fwlink/?LinkId=79983).

6. There are two security groups that are set up for WSUS: WSUS Administrators and WSUS Reporters. WSUS Administrators can perform any WSUS task, while WSUS Reporters have read-only access (view server settings, get reports, and so on). Make sure that the only people in the WSUS Administrators group are the ones who need to perform administrative tasks.

# Best practices for resource usage

### Disk space

The following practices can help you conserve resources on your WSUS server.

1. Make sure that your WSUS server is configured to download only approved updates. When the server synchronizes updates, it downloads only the update metadata and will download the update files only after the update has been approved.
2. Use the Cleanup Wizard on a regular basis. This will keep the number of unneeded updates and revisions to a minimum.
3. If a WSUS server has a small number of clients, or if most of the clients are "roaming" clients with Internet access, you may wish to host update content on Microsoft Update rather than on the local WSUS server. Clients will get update approvals from the server, but can pull the upload files directly from the Internet.
4. If you are storing update content locally on your WSUS server, make sure you have enough disk space on the storage partition. Monitor disk usage on this partition carefully. One way to do this is to configure the WSUS health monitoring thread to warn you with an event if disk usage exceeds a specified percentage. For more information about configuring the health monitoring thread, see the explanation of the **healthmonitoring** parameter of the **wsusutil** utility in Managing WSUS 3.0 from the Command Line.
5. Approve only the updates that are really needed on your network. Limit the product updates to the products that are installed on the network. You can also set up separate WSUS servers for computers with different sets of Microsoft products.
6. Synchronize only the update languages needed on your network. If you need to synchronize more than one language and you are storing updates locally, you should estimate your needed disk space by multiplying the recommended space times the number of update languages. For more information about recommended disk space, see the "Determine WSUS Capacity Requirements" in the Windows Server Update Services Deployment Guide (http://go.microsoft.com/fwlink/?LinkId=79983).

7. Make sure that your WSUS server is configured to synchronize all the needed languages, because you will not be notified of needed updates in the unsynchronized languages. These updates will appear as “Not Needed” on clients who require the language. To help avoid that problem, make sure to include all operating system languages in your WSUS server's synchronization options. You can see all the operating system languages by going to the Computers view of the WSUS administration console and sorting the computers by operating system language. However, you may need to include more languages if there are Microsoft applications in more than one language (for example, if Microsoft Word in French is installed on some computers with Windows XP in English).
8. You should allow WSUS to decline expired updates automatically (click **Options**, click **Automatic Approvals**, click the **Advanced** tab, and then click **Automatically decline updates when a new revision causes them to expire**). If you do not wish to decline expired updates automatically, you should decline them manually on a periodic basis.
9. You should not choose to synchronize express installation files unless you have a pressing need to minimize downloads between the WSUS server and its clients. Typically, using express installation files reduces downloads from WSUS servers to clients by a factor of two but increases downloads from Microsoft Update (or an upstream server) to the WSUS server by a factor of four. You should decide which criteria are more important to your network: local network bandwidth or server disk space and Internet bandwidth.

**Network bandwidth**

The following practices will help you improve the way WSUS uses network bandwidth.

1. When deploying large updates (such as service packs), you can avoid saturating the network by doing the following:
    a. Use BITS throttling. BITS bandwidth limitations can be controlled by time of day, but apply to all applications using BITS. For more information about BITS throttling, see Appendix E: Configuring BITS 2.0 and 3.0 for Download Performance.
    b. Use IIS throttling, which limits throttling to one or more Web services. For more information about IIS throttling, see Appendix F: Configuring IIS for Download Performance.
    c. Use targeting to control the rollout. You can set up multiple computer groups, then approve large service pack downloads for a subset of these groups at one time.

2. Use peer caching (available only on Windows Vista and Windows Server "Longhorn" operating systems) to minimize downloads from WSUS servers to clients and maximize the "sharing" of downloads among peer computers on a subnet of the network. This will reduce network load and in particular load on the WSUS server. For more information about peer caching, see Appendix E: Configuring BITS 2.0 and 3.0 for Download Performance.
3. Consider configuring WSUS clients to synchronize more frequently from the WSUS server and configuring downstream WSUS servers to synchronize more frequently from their upstream servers. This will allow updates to be deployed to clients faster, which could be important if you need to deploy an “emergency update” that must be installed as quickly as possible. This will result in smaller downloads from server to client, but will add additional load to the WSUS server. It will also add additional load to the network when updates are deployed, because clients start downloading updates as soon as they synchronize with the server.

# Best practices for setting up WSUS networks

The following practices will help you configure WSUS networks.

1. If possible, set up WSUS networks with a hub-and-spoke topology rather than a hierarchical one. The greater the number of tiers in the network, the greater the latency in downloading updates.
2. Consider using DNS netmask ordering for roaming clients. For more information about setting up this configuration, see "Appendix D: Configure WSUS for Roaming Clients" in the Windows Server Update Services Deployment Guide (http://go.microsoft.com/fwlink/?LinkId=79983).
3. Configure roaming clients, so they get their updates from the Internet-facing WSUS server, if they do not usually connect to your local intranet.

# Best practices for maintaining WSUS databases

The following practices will help you get the best performance from your WSUS network.

1. Have a maintenance plan for your WSUS database that includes regular backups and periodic re-indexing.
2. Make sure to re-index the WSUS database at least once a month. See Appendix I: Database Maintenance for more information.

# Other best practices

### Manage restarts

The following practices will help you manage computer restarts.

1. Client computers (and most servers) often need restarts after an update is installed. Deferring the restarts will put machines in an unsupported and unstable state, which may include mismatched client and server binaries. These computers should be set up to get automatic downloads and scheduled installs. You can pick a time for scheduled installations when there is little chance for lost productivity (for example, on Sunday at 3:00 A.M). For information about setting up client computers for a scheduled installation, see the "Configure Clients Using Group Policy" in the Windows Server Update Services Deployment Guide (http://go.microsoft.com/fwlink/?LinkId=79983).
2. Critical servers cannot generally be restarted daily. If this is the case, you can either configure them for installations at longer intervals (weekly), or configure them to get automatic downloads but manual installations at a time when the servers can be restarted if necessary.
3. Configure e-mail notification to tell you when updates become available, so you can plan the deployment of these updates in advance.
4. If you need to deploy an “emergency update” and can’t wait for the next scheduled installation, approve the update with a deadline in the past. This will cause the update to be installed the next time the clients synchronize from the server. If you can’t wait for the next synchronization, create a script to automate installing the updates and then restarting your server. For more information about creating scripts to automate Automatic Updates tasks, see the Windows Update Agent Software Developer's Kit (http://go.microsoft.com/fwlink/?LinkID=43101).
5. Configure client computers or WSUS servers to immediately install updates that do not require a restart. For information about setting up client computers for a scheduled installation, see the "Configure Clients Using Group Policy" in the Windows Server Update Services Deployment Guide (http://go.microsoft.com/fwlink/?LinkId=79983).

### Ensure WSUS availability

The following practices will help you ensure that WSUS servers are always available to their clients.

1. There are typically two different backup strategies. The first is a standard backup and restore strategy. For information about backing up and restoring WSUS, see Backing

Up Windows Server Update Services 3.0. This strategy requires more work to maintain and requires extra storage for the backup files, but makes it possible to restore the system to a known state without needing to download the update files once more. The other strategy is to rebuild the server. This is a fairly fast operation and is preferred by many customers, because it requires less work and less disk space.

2. Consider using network load balancing if you have a requirement for high availability. Load balancing involves a more complex configuration and is not typically considered necessary, because new updates are not released very frequently. For more information about setting up network load balancing, see "Appendix C: Configure Network Load Balancing" in the Windows Server Update Services Deployment Guide (http://go.microsoft.com/fwlink/?LinkId=79983).

### Test service packs carefully

You should thoroughly test large bundles of updates such as service packs to ensure that they do not break line-of-business applications. A typical test strategy is to set up test computer groups in which the test computers are configured with the same applications as the production groups, approve installation only to these groups, and then verify that the applications continue to function correctly.

### Check overall system health

The following practices will help you monitor the general health of your WSUS network.

1. You should check the WSUS administration console home page at least once a day to view overall update compliance and network health.
2. Check application logs frequently, if you suspect problems such as download failures or clients that are failing to report to the WSUS server.
3. Install the WSUS MOM Pack to monitor overall service health.

# Managing WSUS 3.0 from the Command Line

The **wsusutil** command-line utility is used in managing WSUS servers and is located in the *WSUSInstallDir*\Tools folder of WSUS servers. The table below summarizes the different parameters that can be used with this utility, and later sections explain the syntax and usage of each parameter.

**Note**

You can also use Windows® PowerShell® to access the WSUS 3.0 APIs from the command line.

# Using the wsusutil utility

You must be an administrator to run the **wsusutil** utility. This utility is installed only on WSUS server machines, not on console-only installations.

**Note**

To see all **wsusutil** parameters, type **wsusutil help** on the command line. To see usage for each of the parameters, type **wsusutil help***parameterName*.

**Summary of wsusutil Commands**

| Command | Description |
|---|---|
| **configuressl** | Updates the WSUS server registry key after the IIS configuration has changed. |
| **healthmonitoring** | Configures health monitoring values in the database. If new values are not specified, the current values are displayed. |
| **export** | Part of the export/import process used to synchronize a downstream WSUS without using a network connection.<br>Exports update metadata to an export package file. You cannot use this parameter to export update files, update approvals, or server settings. |
| **import** | The second part of the export/import process.<br>Imports update metadata to a server from an export package file created on another WSUS server. This synchronizes the destination WSUS server without using a network connection. |

| Command | Description |
|---|---|
| **movecontent** | Changes the file system location where the WSUS server stores update files, and optionally copies any update files from the old location to the new location |
| **listfrontendservers** | Lists the front-end servers related to this WSUS server. |
| **deletefrontendserver** | Deletes the specified front-end server from the WSUS database. |
| **checkhealth** | Checks the health of the WSUS serve. Results will appear in the Application Event log. |
| **reset** | Checks that every update metadata row in the database has corresponding update files stored in the file system. If update files are missing or have been corrupted, downloads the update files again. |
| **listinactiveapprovals** | Returns a list of update titles with approvals that are in a permanently inactive state because of a change in server language settings. |
| **removeinactiveapprovals** | Removes approvals for updates that are in a permanently inactive state because of a change in WSUS server language settings. |
| **usecustomwebsite** | Changes the port number used by the WSUS Web services from 80 to 8530 or vice versa. |

## configuressl

Updates the WSUS server registry key after the IIS configuration has changed. If this command is run with the optional parameter ServerCertificateName, it updates the certificate name. If it is run without the optional parameter, it updates the setting for host headers, if there are any. For more information about configuring SSL for WSUS, see

"Securing WSUS with the Secure Sockets Layer" in Deploying Microsoft Windows Server Update Services (http://go.microsoft.com/fwlink/?linkid=79983).

### Syntax

The following command updates the host headers, if any:

**wsusutil configuressl**

The following command updates the server certificateName:

**wsusutil configuressl** *ServerCertificateName***//sets the server certificate name**

| Parameter | Description |
|---|---|
| *ServerCertificateName* | An optional parameter. When present, it provides the name in the **Issued to** field of the server certificate. |

### Output

The output from the **wsusutil configuressl** command is the address of the WSUS Web site (including the port number), for example **https://serverName:443**.

## healthmonitoring

This command sets and gets the different parameters for WSUS health monitoring.

### Syntax

**Wsusutil healthmonitoring** *parameterName*

**Note**

You may set or get only one parameter at a time.

| Parameter | Description |
| --- | --- |
| **IntervalsInMinutes** *[DetectInterval] [RefreshInterval]* | Sets the values for detect and refresh intervals. If the detect interval is 0, the detect cycle will not run. If the refresh interval is 0, the refresh cycle will not run. For more information about the detect and refresh cycles, see Health Monitoring in WSUS 3.0. |
| **DiskSpaceInMegabytes** *[ErrorLevel] [WarningLevel]* | Sets the amount of available disk space (in megabytes) at which a low disk space warning or error event should be logged. |
| **CatalogSyncIntervalInDays** *[Days]* | Sets the number of days that should have passed after synchronization before a warning event should be logged.. |
| **InstallUpdatesInPercent** *[WarningPercent][ErrorPercent]* | Sets the percentage of update installation failures at which a warning or error event should be given. |
| **InventoryInPercen** *[WarningPercent][ErrorPercent]* | Sets the percentage of inventory reporting failures at which a warning or error should be given. |
| **SilentClientsInPercent** *[WarningPercent][ErrorPercent]* | Sets the percentage of clients not reporting to the server at which a warning or error should be given. |

| Parameter | Description |
|---|---|
| **SilentClientsInDays** *[Days]* | Sets the number of days clients can fail to report before an error should be given. |
| **TargetComputersInPercent** *[WarningPercent][ErrorPercent]* | Sets the maximum percentage of target computers reporting to this server below which a warning or error event should be given. For example, if you set values of 80 and 60, a warning event will be logged if only 80 percent of computers have reported, and an error event will be logged if only 60 percent of computers have reported. |
| **CheckAcls** *on\|off* | If on, health monitoring should check ACLs on the relevant directories. |
| **CheckForLowDiskSpace** *on\|off* | If on, health monitoring should check for low disk space. |
| **CheckForCatalogSyncFailures** *on\|off* | If on, health monitoring should check for catalog synchronization failures. |
| **CheckForContentSyncFailures** *on\|off* | If on, health monitoring should check for content synchronization failures. |
| **CheckForEmailNotificationFailures** *on\|off* | If on, health monitoring should check for e-mail notification failures. |

| Parameter | Description |
|---|---|
| **CheckSelfUpdate** *on\|off* | If on, health monitoring should check for client self-update failures. |
| **CheckClientsExist** *on\|off* | If on, health monitoring should check whether this server has any clients. |
| **CheckForUpdateInstallFailures** *on\|off* | If on, health monitoring should check for update installation failures. |
| **CheckForInventoryFailures** *on\|off* | If on, health monitoring should check for clients failing to report inventory.. |
| **CheckForSilentClients** *on\|off* | If on, health monitoring should check for clients that have failed to report to the server. |
| **CheckForTooManyClients** *on\|off* | If on, health monitoring should check whether the number of clients is approaching the maximum number allowed. |
| **CheckReportingWebService** *on\|off* | If on, health monitoring should check the Reporting Web service. |
| **CheckApiRemotingWebService** *on\|off* | If on, health monitoring should check the API Remoting Web service. |
| **CheckServerSyncWebService** *on\|off* | If on, health monitoring should check the Server Synchronization Web service. |

| Parameter | Description |
|---|---|
| **CheckClientWebService** *on\|off* | If on, health monitoring should check the client Web service. |
| **CheckSimpleAuthWebService** *on\|off* | If on, health monitoring should check the Simple Authentication Web service. |
| **CheckDssAuthWebService** *on\|off* | If on, health monitoring should check the Downstream Server Authentication Web service. |

### Output

The output from **wsusutil** *paramName* is usually the current state of the given parameter. Some examples are given below:

**wsusutil healthmonitoring** *IntervalsInMinutes*

Output:

**Detect interval: 10 min, Refresh interval: 360 min**

**wsusutil healthmonitoring** *DiskSpaceInMegabytes*

Output:

**Error level: 200 MB, Warning level: 500 MB**

However, with the parameters setting on or off the different health monitoring checks (for example, **wsusutil healthmonitoring***CheckAcls*), the output will simply be a warning that the WSUS Service must be stopped and restarted for the change to take effect.

## export

For more information about exporting and importing updates, see "Set Up a Disconnected Network (Import and Export Updates)" in Deploying Microsoft Windows Server Update Services (http://go.microsoft.com/fwlink/?linkid=79983).

### Syntax

**wsusutil export** *package logfile*

| Parameter | Description |
|---|---|
| *package* | The path and file name of the package .cab to create. |
| *logfile* | The path and file name of the log file to create. |

**Note**

Exporting from a WSUS 2.0 server to a WSUS 3.0 server (or from a WSUS 3.0 server to a WSUS 2.0 server) is not supported.

## Import

For background and procedural information about exporting and importing updates, see "Set Up a Disconnected Network (Import and Export Updates)" in Deploying Microsoft Windows Server Update Services (http://go.microsoft.com/fwlink/?linkid=79983).

### Syntax

**wsusutil import** *package logfile*

| Parameter | Description |
|---|---|
| *package* | The path and file name of the package .cab to import. |
| *logfile* | The path and file name of the log file to import. |

**Note**

Importing from a WSUS 2.0 server to a WSUS 3.0 server (or from a WSUS 3.0 server to a WSUS 2.0 server) is not supported.

## Movecontent

When you run this command, **wsusutil** does the following:

- Copies the update files from the old location to the new location. The old location is not deleted.
- Updates the WSUS database to refer to the new location of the update files.
- Ensures that the content and metadata are synchronized. This check is always run, even if the **–skipcopy** parameter is used.

The destination folder to which update files are moved must be on an NTFS partition. The utility will not try to copy update files if they already exist in the destination folder. The destination folder will have the same permissions that were set on the original folder.

**Note**

You can use **xcopy**, the Backup utility, or other methods to copy update files from the old location to the new one. If you copy the files by using a method other than **wsusutil**, you still need to run **wsusutil** to perform the second part of the move, using the -**skipcopy** parameter. See the "Syntax" section for more information.

There are two scenarios in which you might move update files from one WSUS drive to another:

- If the drive is full
- If the hard disk fails

### If the drive is full

If the drive where WSUS stores update files is full, you can do one of the following:

- Add more space to your current drive by using NTFS functionality. This operation can be done without using **wsusutil**, because it does not affect WSUS configuration or operation.
- Install a new drive, and then move the update files from the old drive to the new location by using **wsusutil**.

### If the hard disk fails

If the hard disk fails, you must do the following:

1. Install the new disk on your computer, and then restore the update files from your backup files. Note: If you have not backed up your update files, WSUSutil.exe downloads the missing files at the end of the content move operation.
2. Run **wsusutil movecontent** *newLocation*, specifying the location for the new disk. In addition, you specify the -**skipcopy** parameter, because you are either putting the files in the new folder through the backup utility or the source folder does not exist; the update files will be downloaded at the end of this process.
3. When the move operation is complete, all the missing files are downloaded.

### Syntax

**wsusutil movecontent** *contentpath logfile* **-skipcopy**

| Parameter | Description |
|---|---|
| *contentpath* | The new root for content files. The path must exist. |
| *logfile* | The path and file name of the log file to create. |
| *-skipcopy* | Indicates that only the server configuration should be changed, and that the content files should not be copied. |

## listfrontendservers

This command lists the different front-end servers in a network load balancing configuration. It can be useful in troubleshooting a NLB (network load balancing) configuration and after setting up a new front-end server to make sure that it is configured properly.

## deletefrontendserver

This command deletes the given front-end server.

### Syntax

**wsusutil deletefrontendserver** *serverName*

| Parameter | Description |
| --- | --- |
| *serverName* | The name of the front-end server to be deleted. |

**Important**

This command removes the front-end server from the database only. You will need to run **wsussetup /u** on the front-end server to uninstall WSUS.

## checkhealth

This command checks the health of the WSUS server. The health check is configured by **wsusutil healthmonitoring**). The results are written to the event logs.

### Syntax

**wsusutil checkhealth**

## reset

You use this command if you store updates locally on your WSUS server and want to ensure that the metadata information stored in your WSUS database is accurate. With this command, you verify that every update metadata row in the WSUS database corresponds to update files stored in the local update file storage location on your WSUS server. If update files are missing or have been corrupted, WSUS downloads the update files again. This command might be useful to run after you restore your database, or as a first step when troubleshooting update approvals.

### Syntax

**wsusutil reset**

## listinactiveapprovals

If you change language options on an upstream WSUS server, the number of approved updates on the upstream server may not match the number of approved updates on a replica server. For example, consider the following scenario. You configure your upstream server to synchronize all languages, then synchronize and approve 300 updates, of which 50 are non-English language updates. Afterward, you change the

language setting on the server to English only. Later, a replica server synchronizes from the upstream server and downloads the "active" approvals, which now are only the English language ones (replica servers synchronize only active approvals). At this point, you will see 300 updates approved on the upstream server, but only 250 approved on the replica server. You can use **listinactiveapprovals** to see a list of the updates on the parent upstream server that are permanently inactive—in this case, the 50 updates that are not English. You do not have to run this command before running the **removeinactiveapprovals** command.

### Syntax

**wsusutil listinactiveapprovals**

## removeinactiveapprovals

See the explanation above for a description of situations in which you might need to use **removeinactiveapprovals**. You do not have to run the **listinactiveapprovals** command before running this command.

### Syntax

**wsusutil removeinactiveapprovals**

## usecustomwebsite

If you set this value to **on**, WSUS will use port 8530 for its Web site. If you set it to **off**, WSUS will use port 80.

**Important**

You must use this command before you configure SSL.

### Syntax

**wsusutil usecustomwebsite on**

# Reports in Windows Server Update Services 3.0

Reports are an important part of managing WSUS. You can keep track of nearly every aspect of the WSUS network by means of reports. The most important kinds of reports are:

- Summary compliance reports (the number of computers that need to install updates and the number of updates missing from computers).You can generate these reports from the root node of the WSUS administration console.
- Individual computer reports. You can generate these reports by right-clicking the computer in the **Details** pane.
- Individual update reports. You can generate these reports by right-clicking the update in the **Details** pane.
- Downstream server summary compliance reports. You can generate these reports by right-clicking the server in the **Details** pane.
- Synchronization reports. You can generate these reports by right-clicking the synchronization in the **Details** pane.

**In this section**



# Terminology for Update Status

You can access update status from various locations in the WSUS console. The following table defines each possible status that can be reported by WSUS for an update. Typically, WSUS presents update status for a particular computer (for example, the status of an update on one computer) or computer group (for example, status for the five computers in Computer Group X on which the update has been installed). You can filter the default views of computers or updates by update status, and in some cases by combinations of statuses (Failed or Needed, Installed/Not Applicable or No Status, and so on).

**Update Status Definitions**

| Status | Description |
|---|---|
| Installed | The update is installed on the computer. |
| Needed | When referring to the status of one computer, Needed means the update is compatible with (and should be installed on) the computer. When referring to status for a computer group, the **Needed** column displays the number of computers in the group to which the update is applicable. A positive Needed result means that the update was determined to be applicable, but has not been installed the last time client computers contacted the WSUS server,. Any of the following could be true when the status for an update is Needed:<br>• You have approved the update for installation, but the client computers have not yet contacted the WSUS server since you made this change.<br>• The update has already been downloaded and installed, but the client computer has not contacted the WSUS server since the update was installed.<br>• The update has already been downloaded and installed, but the client computer must be restarted before changes go into effect, and the client computer has not yet been restarted.<br>• The update has been downloaded to the computer but not installed.<br>• The update has been neither downloaded nor installed on the computer. |

| Status | Description |
|---|---|
| Installed/Not Applicable | When referring to the status of one computer, Installed/Not Applicable means the update is not applicable to or required by that computer. When referring to the status for a computer group, the Installed/Not Applicable column displays the number of computers in the group for which the update is not applicable or not required. |
| No status | This usually means that since the time that the update was synchronized to the WSUS server, the computer has not contacted the WSUS server. |
| Failed | An error occurred when either a detection or an installation was attempted on the computer for the update. |
| Last contacted | This is the date on which the computer last contacted the WSUS server. |

# Creating Reports

Reports enable you to monitor different aspects of the WSUS network: updates, client computers, and downstream servers. If a WSUS server has replica servers, you can choose to roll up the replica servers' client status to the upstream server. For details on creating a replica server and status rollup, see Deploying Microsoft Windows Server Updates Services (http://go.microsoft.com/fwlink/?linkid=79983).

You can generate different kinds of update reports from different places in the WSUS administration console.

1. General reports on the Reports page: as described below.
2. Reports on specific updates: right-click the update (or go to the **Actions** pane) and choose **Status Report.**
3. Reports on specific computers: right-click the computer (or go to the **Actions** pane)and choose **Status Report**.

**Note**

Generating detailed reports for large numbers of computers and/or updates can be very memory-intensive. Detailed reports are most effective for smaller subsets of your computers or updates. If you need to create a very large report and are concerned about using CPU and memory resources on the WSUS server, you may generate the report from a remote WSUS Administration console.

# Using the Reports page

You can generate three kinds of reports, as described in the following table.

| Report name | Function |
|---|---|
| Update Reports | View update status. |
| Computer Reports | View computer status. |
| Synchronization Reports | View the results of the last synchronization. |

## Update reports

Update reports show you the status for your updates. You can view the report in three ways: summary, detailed, and tabular. You can also filter the report by update classification, product, target computer group, or update installation status.

The report displays information from the most recent contact between client computers and the WSUS server. The frequency with which client computers contact the WSUS server is configured through Group Policy. By default, this is every 22 hours. Unless you want to change the contact frequency for your client computers, generate this report the day after you approve updates, so that it reflects your latest approvals. For more information about configuring Group Policy, see Deploying Microsoft Windows Server Updates Services (http://go.microsoft.com/fwlink/?linkid=79983).

**Note**

You can run **wuauclt /detectnow** from the command line on computers that are running WSUS client software (Automatic Updates) in order to start contact between the client computer and WSUS server). This is used primarily to update status for a particular computer. There will be a few minutes' delay between running the command and seeing the results on the WSUS server. After forcing

the client to contact the server, you can get its status with an update status report. For more information about wuauclt, see Appendix H: The wuauclt Utility.

**To run an update report**

1. In the WSUS administrative console, select the **Reports** node
2. In the **Reports** pane, click **Update Status Summary**. This will give you an overview update report.
3. In the **Updates Report** window you can configure the updates you want to see by classification, product, computer group, or update installation status.
4. Click **Run Report**.

## Update Status Summary view

The Update Status Summary view contains the elements listed in the following table.

**Description of elements displayed in the Update Status Summary view**

| Column name | Description |
|---|---|
| Updates Report tree view | The tree listing all the updates in the report. |
| Title | The title of the update. |
| Description | The description of the update. |
| Classification | The classification of the update. |
| Products | The products to which the update applies. |
| MSRC Severity Rating | Microsoft Security Response Center rating. |
| MSRC Number | Microsoft Security Response Center identification number. |
| More information | Redirection to the relevant Web site. |
| Approval Summary for Computer Group | The listing of groups and approvals. |
| Group | The computer group. |
| Approval | Approval status (Approved, Not approved, Declined). |
| Deadline | The date by which the update must be installed. |

| Column name | Description |
|---|---|
| Administrator | The administrative action. |

You can change the view of an Update Status Summary report to a detail view or a tabular view by clicking **Report View** in the **Updates Report** toolbar.

## Computer Status report

The Computer Status report provides an update status summary for the computers you specify.

**To run a status report for computers**

1. In the WSUS administrative console, select the **Reports** node.
2. In the **Reports** pane, click **Computer Status Summary**. This will give you an overview computer report.
3. In the **Computers Report** window, you can configure the updates you want to see by classification, product, computer group, or update installation status.
4. Click **Run Report**.

You can reformat the computer status report in summary, detailed, and tabular views, as with the update status report.

## Synchronization Results report

The Synchronization Results report enables you to see synchronization information for your server for a given time period, including errors that occurred during synchronization and a list of new updates. In addition, you can get general, status, and revision information for each new update.

**To run a Synchronization Results report**

1. In the WSUS administrative console, click **Reports**.
2. On the **Reports** pane, click **Synchronization Results**. By default, the report shows any synchronizations done today.
3. To change the synchronization period for the report, in the **Synchronization Report** window, click **Between these dates** and specify the dates you want included in the report.

4. Click **Run Report**.

The report has four components, which are described in the following table.

**Components of Synchronization Results Report**

| Component name | Purpose |
|---|---|
| Report Options | Shows the start and end dates of the period shown in the report, as well as the date of the report and the server for which the report was made. |
| Synchronization Summary | Displays summary information of the numbers of new, revised, and expired updates in each synchronization. |
| New Updates | Displays the new updates that have been synchronized to the WSUS server during the report's time period.<br>You can view the properties for each update by clicking the update. An update status report will be generated for that individual report. |
| Revised Updates | Displays the revised updates that have been synchronized to the WSUS server during the report's time period.<br>You can view the properties for each update by clicking the update. An update status report will be generated for that individual report. |
| Expired Updates | Displays the updates that have been expired during the report's time period.. |

## Printing the report

You can print the report in update summary, detailed, or tabular views, depending on how you have formatted the update status report.

**To print the update status report**

1. On the **Updates Report** toolbar, click the printer icon.
2. In the **Print** dialog, select your options and click **Print**.

### Exporting the report

You can print the report in its original format, or you can export it to Microsoft Excel or PDF formats.

**Important**

Exporting a large report can be extremely time consuming. If you are planning to export your report, consider limiting the size of the report to 200 pages or fewer. You can use different filters to reduce the size of the report, or you can choose the tabular format rather than the detailed format to reduce the number of pages to export.

**To export a report to Excel or PDF format**

1. Run the report you wish to export.
2. On the **Updates Report** toolbar, click the down arrow associated with the save icon.
3. You will see two options: **Excel** and **Acrobat (PDF) file**. Click one of the options.

# Extending reports

You can customize WSUS reports in different ways:

1. Use the WSUS APIs to create a custom report
2. Use WSUS public views to create and extend custom reports

### Use WSUS APIs to create custom reports

For more information on WSUS APIs, see the Windows Server Update Services SDK documentation on MSDN (http://go.microsoft.com/fwlink/?LinkId=85713). You can use these APIs to create reports on updates, approvals, installation information, and the like.

### Use WSUS public views to create custom reports

For more information on public views, as well as sample queries, see the WSUS SDK conceptual documentation on MSDN (http://go.microsoft.com/fwlink/?LinkId=85715.) If you are using SQL Server 2005 as the WSUS database, you can use the SQL Server 2005 Report Builder to generate custom reports using these views, or you can access the views from the command line. If you are using Windows Internal Database as the WSUS database, you can access it via the command line if you download the Microsoft SQL Server 2005 Command Line Query Utility and the SQL Native Client from Microsoft Download Center (http://go.microsoft.com/fwlink/?LinkId=70728).

# Securing Windows Server Update Services 3.0

For synchronization with upstream WSUS servers, you can use Secure Sockets Layer (SSL) protocol to secure the update metadata portion of the synchronization. WSUS can use SSL to:

- Enable client computers and downstream WSUS servers to authenticate an upstream WSUS server.
- Encrypt metadata passed on to client computers and downstream WSUS servers.

For more information about configuring your WSUS server to use SSL, see Deploying Microsoft Windows Server Update Services (http://go.microsoft.com/fwlink/?linkid=79983).

# Troubleshooting Windows Server Update Services 3.0

This guide provides troubleshooting information for Windows Server Update Services. For additional information about troubleshooting, see How to troubleshoot Windows Update, Microsoft Update, and Windows Server Update Services installation issues (http://go.microsoft.com/fwlink/?LinkId=80711).

**In this guide**

- WSUS 3.0 Client Computer Administration Issues

# Health Monitoring in WSUS 3.0

WSUS monitors the health of the WSUS server and its components by means of a service that runs at frequent intervals and logs the results as events in the event log. You can look at the events with the Event Viewer, and you can get more information by downloading the WSUS 3.0 MOM Pack.

## Health checks

The WSUS health monitoring service automatically checks the health of WSUS components as long as WSUS server components are installed on the computer. (The service does not run on computers where only the console or only the database is installed.) The health check service has two cycles: detect and refresh. In the detect cycle, only changes are logged (for example, a service was running but has stopped). In the refresh cycle, all errors and warnings are logged. By default the detect cycle polls WSUS components every ten minutes and the refresh cycle polls every six hours, but if you wish to run the health check at other times (for example, to verify a configuration change to WSUS or to configure the service to run more or less often), you can use the **wsusutil** utility. For instructions on running the utility, see Managing WSUS 3.0 from the Command Line under the "healthmonitoring" section.

### Polling WSUS components

The following WSUS components are checked for potential problems:

- Core: issues with disk space, permissions, e-mail notifications, and catalog and content synchronization
- Database: issues with connectivity and availability
- Web Services: issues with permissions and Web service health
- Clients: issues with clients not reporting, client self-update, the update agent, client inventory, and clients' ability to install updates

## Viewing event logs

The events generated by the health monitoring service are logged in the Application event log.

**To view WSUS events**

1. Start the Event Viewer (click **Start**, click **Run**, and then type **eventvwr**).
2. In the left pane, click **Application**.
3. Find the events whose source is Windows Server Update Services.

WSUS logs error, warning, and informational events. Errors are problems that should be fixed immediately (for example, that available local storage has dropped below a certain level), warnings are notifications of situations that are tending to become problems (for example, that WSUSService has stopped, or that synchronization has not taken place in the last 24 hours), and informational events are notifications of situations that are probably not problems (for example, that a service has stopped or started).

## Resolving problems

In many cases the solution to an error or warning event will be obvious. For example, if disk space is low, you would remove unneeded files. In other cases, you might need to do more investigation before deciding on the right solution. You could read the troubleshooting sections of this document, or search online for similar issues. If you are using the Microsoft Operations Manager, you can also download the WSUS 3.0 (MOM) Pack.

WSUS 3.0 Server Administration Issues

WSUS 3.0 Client Computer Administration Issues

# WSUS 3.0 Server Administration Issues

**In this section**

# Issues with Setup

If you are having trouble installing WSUS, use the following information to troubleshoot the problem.

# Troubleshooting WSUS setup

### Check for required software and hardware

WSUS has a number of requirements that need to be met before installation. For more information, see Deploying Microsoft Windows Server Update Services (http://go.microsoft.com/fwlink/?linkid=79983).

### Check setup logs

WSUS setup creates the following four log files that can help you diagnose problems with setup. These log files are located in the %temp% directory of the user who ran the installation process.

- WSUSSetup.log: The status of each of the component installations performed during WSUS setup is logged to this file. You can check this log to see whether any of the component installations failed. If you see a failure, you can check the corresponding log to see what went wrong during the installation of that component.
- WSUSSetupMsi_*timestamp*.log: This log file is generated by MSI for WSUS component setup. Windows installer, before invoking any of the custom actions and standard actions, logs that information to this file. The return values from the custom actions are logged to this file as well. This log file is useful if there are errors invoking any of the custom actions.

- WSUSCa_*timestamp*.log: This log file is used by custom actions. Errors that occurred while executing any of the custom actions in WSUS component or BITS setup are logged to this file.
- WSUSWyukonSetup_*timestamp*.log: This is the log file for Windows Internal Database setup. All Windows Internal Database installation/uninstallation information is logged to this file.

## Check the .NET framework installation

If the .NET framework has not been installed correctly, WSUS setup may fail.

- One symptom of this is the failure to run HideConsoleApp.exe. Search WSUSSetupMsi_*timestamp*.log file for "HideConsoleApp.exe" and look at the return value of the corresponding custom action. If the return value is non-zero, the executable failed to run. Note that HideConsoleApp.exe may fail because of several other reasons. The MSUSCa_*timestamp*.log file will give the specific reason it failed.
- Reinstalling .NET framework may solve this problem.

## The WSUSService service is marked for deletion

WSUS installs the WSUSService service during setup and deletes it during uninstallation. During uninstallation, if some other process is using the service, the service is not deleted completely but is marked for deletion. It is deleted only after all processes have stopped using the service. If the service is not deleted properly after uninstallation, then the next installation may fail, because WSUSService cannot be installed while it is marked for deletion.

- Look at the WSUSSetupMsi_*timestamp*.log file for the return value of HideConsoleApp.exe. If the return value is not zero, that means that the custom action running HideConsoleApp.exe failed.
- Look at the WSUSCa_*timestamp*.log file to see whether the failure is due to the service being marked for deletion.
- Reboot the machine and rerun setup. All the open handles to the service are closed when the machine shuts down, and this should resolve the problem.

## On a domain controller, the NetBiosDomainName is different from the DNS domain name

Setup can fail because it uses the DNS domain name instead of the NetBiosDomainName when setting database permissions to the IWAM account.

- Check the NetBiosDomainName and the DNS domain name on the machine. These names must be identical for WSUS setup to succeed.

### Duplicate ASP.Net entries in the IIS Web services list

The ASP.Net Web service extension may occasionally be listed twice in the IIS configuration. If this is the case, WSUS setup will fail when it tries to install and configure its v-roots.

- Check WSUSSetup.log for the following entry:

```
Error IISCustomAction Command /Install FailedSystem.ArgumentException: Item has
already been added. Key in dictionary: "enableasp.net"  Key being added:
"enableasp.net"
```

- Disable and then reenable the ASP.NET V2.0.50727 Web service extension through the IIS UI. Make sure that the final status of this Web service extension is “allowed.”

### There is a SUSDB database from an earlier installation

Reinstallation of WSUS can fail if there is a SUSDB database from a previous WSUS installation. You will need to remove this database before restarting WSUS setup.

# Issues with Upgrades

Use the information below to troubleshoot WSUS upgrade issues.

# Troubleshooting WSUS upgrades

### When a WSUS upgrade fails, WSUS might get uninstalled

You may lose your previous WSUS settings and data if an upgrade fails. Therefore, before attempting an upgrade, back up the following:

- WSUS database
- Update file storage folder

For information about backing up and restoring your existing WSUS installation, see Backing Up Windows Server Update Services 3.0.

# Issues with the WSUS 3.0 Administration Console

If you get an error when using or trying to access the WSUS console, use the following information to troubleshoot the problem.

# Troubleshooting the WSUS administration console

## Cannot access the WSUS administration console and a timeout error message appears

If you cannot access the WSUS console and a timeout error message appears, the CPU of the WSUS server may be at, or very close to, maximum utilization, causing the database to time out. If the database software times out, the WSUS console cannot be displayed.

One way of inadvertently overtaxing your WSUS server is to have antivirus software monitor the WSUS content directory. During synchronization, the antivirus software can overload the CPU. You can work around this situation by setting the antivirus software to ignore the directory where WSUS content is stored.

## Get an error looking at a network load balanced cluster if the "master" is unavailable

If you are looking at a WSUS server on a network load balanced cluster from a remote administration console, and the server that is currently the "master" server becomes unavailable, you may see the following error:

```
System.Net.Sockets.SocketException Message:
No connection could be made because the target machine actively refused it
Source: System
Stack Trace:
   at System.Net.Sockets.Socket.DoConnect(EndPoint endPointSnapshot, SocketAddress
socketAddress)
   at System.Net.Sockets.Socket.InternalConnect(EndPoint remoteEP)
   at System.Net.ServicePoint.ConnectSocketInternal(Boolean connectFailure, Socket
s4, Socket s6, Socket& socket, IPAddress& address, ConnectSocketState state,
IAsyncResult asyncResult, Int32 timeout, Exception& exception)
```

You should wait at least 30 seconds before clicking **Reset** on the error message.

## Cannot see client computers in the WSUS administration console

If client computers do not appear on the **Computers** page in the WSUS administration console, there is probably a problem with client self-update, which is the mechanism that WSUS uses to update Automatic Update software. For more information about client self-update, see Issues with Client Self-Update.

## Get error accessing WSUS 3.0 servers from the WSUS administration console because the WWW Publishing service is configured to allow interaction with the desktop

If you attempt to access the WSUS administration console and fail to connect to the server, you may have gotten the following error:

```
The WSUS administration console was unable to connect to the WSUS Server via the
remote API.
Verify that the Update Services service, IIS, and SQL are running on the server.
If the problem persists, try restarting IIS, SQL, and the Update Services Service.
The WSUS administration console has encountered an unexpected error. This may be a
transient error; try restarting the administration console. If this error
persists, try removing the persisted preferences for the console by deleting the
wsus file under %appdata%\Microsoft\MMC\.
System.IO.IOException -- The handshake failed due to an unexpected packet format.
…
```

This error is probably due to the WWW Publishing service being configured to allow interaction with the desktop. To solve this problem, take the following steps:

1. Open the Services snap-in (click **Start**, click **Run**, and then type **services.msc**).
2. Right-click the World Wide Web Publishing service and select **Properties**.
3. On the **LogOn** tab, clear the **Allow service to interact with desktop** check box.
4. Click **OK**, and then dismiss the Services snap-in.
5. From a command shell, type **iisreset**.
6. At this point you should be able to access the WSUS server from the console again.

This error is caused by the issue described in KB919085 (http://go.microsoft.com/fwlink/?LinkId=86366).

### Get other errors accessing WSUS 3.0 servers from the WSUS administration console

In many cases, when you have gotten a connection error, it may be helpful to run the **iisreset** command.

# Issues with Update Storage

Updates can be stored on the local WSUS server or on Microsoft Update. Use this section to troubleshoot problems with update storage.

# Troubleshooting update storage

### The updates listed in the WSUS administrative console do not match the updates listed in your local folder

This can happen under different circumstances. For example, if updates are stored on a disk separate from the one on which WSUS is installed, and that disk fails, when you replace the failed disk with a new (empty) disk, the WSUS application will still show all of the updates as downloaded.

To have WSUS resynchronize the updates in local storage with the updates in the database, you must run the WSUSUtil utility **reset** command. For more information about WSUSUtil, see Managing WSUS 3.0 from the Command Line.

**Note**

Performing a reset causes the WSUS server to be unresponsive for up to five minutes.

**To have WSUS verify locally stored updates**

1. Open a command window.
2. Navigate to the directory that contains WSUSutil.exe. (It can be found in the Tools subdirectory of the WSUS installation directory.)
3. Type **wsusutil reset**

## Downloads from a WSUS server are failing

There may be problems with the permissions on the WSUS server's local content directory. Permissions are set correctly by WSUS setup when the directory is created, but subsequent changes may have reset these permissions. One indication of this problem may be event ID 10012 in the Application log file.

The following permissions are necessary:

- The root folder of the local content directory must have at least Read permissions for the Users security group and the NT Authority\Network Service account. In other words, if the WSUS content directory is C:\Updates\WSUSContent, the Updates directory must have the correct permissions. The BITS service will fail if these permissions are not set.
- The content directory itself (in the above example, the WSUSContent directory) must have Full Control permissions for the NT Authority\Network Service account.
- The temporary ASP.NET directory (*%windir%*\Microsoft.NET\Framework\v2.0.50727\Temporary ASP.NET Files) must have Full Control permissions for the NT Authority\Network Service account.
- The %TEMP% directory (usually %windir%\TEMP) must have Full Control permissions for the NT Authority\Network Service account.

## The local content directory is running out of disk space

Synchronization may fail if the local WSUS content directory does not have sufficient disk space. It is recommended that you monitor disk space carefully to keep this problem from arising. Low disk space is indicated by event ID 10041 and event ID 10042.

The following procedures will help you overcome low disk space problems:

- Using Disk Cleanup to remove unneeded files on the drive.
- Using the Server Cleanup Wizard to remove unneeded content. For more information about this wizard, see Using the Server Cleanup Wizard.
- Moving the content directory to another drive.
- Moving the SQL Server database to another drive.

### To use Disk Cleanup to remove unneeded files on the drive

1. Click **Start**, click **All Programs**, click **Accessories**, click **System Tools**, and then click **Disk Cleanup**.
2. Select the Windows components, applications, and files that can be removed,

and then click **OK**.

**To move the content directory to another drive**

1. Create a new content directory on another drive.
2. Locate the WSUSUtil.exe utility in the Tools directory of your WSUS installation (typically C:\Program Files\Update Services\Tools).
3. Open a command window, navigate to the Tools directory, and type the following:

   **wsusutil movecontent** *NewContentPath MoveLog*

where NewContentPath is the new content directory, and MoveLog is the path and filename of the log for this operation.

**Note**

For more information about using the WSUSUtil utility, see Managing WSUS 3.0 from the Command Line.

Before you move the SQL Server installation to another drive, you should make sure that the WSUS administration console is not open. If you have problems with the move, make sure that the WSUS Web services have been stopped. Occasionally, a move will fail if the clients are communicating with the server.

**To move the SQL Server installation to another drive**

1. Open a command window.
2. Type **net stop wsusservice**
3. Detach the SUSDB database.
4. Copy SUSDB.mdf and SUSDB_log.ldf to the new location.
5. Attach the SUSDB database from the new location.
6. Type **net start wsusservice**
7. When the system is working properly, delete SUSDB.mdf and SUSDB_log.ldf from the old location.

**Note**

Consult your SQL Server documentation to find out how to detach and reattach databases.

# Issues with Synchronization

Synchronization is the process in which the WSUS server connects to Microsoft Update or another WSUS server and downloads updates. During synchronization, WSUS determines if any new updates have been made available since the last time you synchronized. If it is your first time synchronizing WSUS, all updates are made available for approval. If synchronizations are failing, you can use the information below to troubleshoot the problem.

# Troubleshooting synchronization

## Check the error in the synchronization's Details pane

If a synchronization has failed, in the WSUS administration console, go to the **Synchronizations** node, and in the middle pane select the failed synchronization. In the **Synchronization Details** pane you will see **Details**, which links to the full error description.

## Synchronization retries by downstream servers

If the upstream WSUS server is not available for synchronization from a downstream server at the scheduled time, the downstream server will try to synchronize twice more, at approximately 15 minute intervals. If neither of the retries succeeds, the downstream server will try again the next day at the scheduled synchronization time.

## Check proxy server settings by using the WSUS console

If your WSUS server is connected to Microsoft Update via a proxy server, you must use the WSUS console to configure WSUS so that it can access the Internet. For basic instructions about setting up a proxy server, see Deploying Microsoft Windows Server Update Services (http://go.microsoft.com/fwlink/?linkid=79983). If your proxy server supports authentication, make sure you have the correct user name, password, and domain. Note that if you use the WSUS console option for **Allow basic authentication (password in cleartext**), the password for the account is sent over the network in unencrypted text.

One major cause of synchronization failure is an expired password on the proxy server. Make sure the user name and password for the proxy server are always up to date.

## Check the firewall settings

If your network has a firewall between the WSUS server and the Internet, make sure that all the necessary ports are open and the necessary domains are allowed. For more information, see Deploying Microsoft Windows Server Update Services (http://go.microsoft.com/fwlink/?linkid=79983).

## Check the name of the upstream WSUS server

If your WSUS uses another WSUS server as its update source, make sure you are using the correct name for the upstream WSUS server and that you have spelled it correctly. For basic instruction about synchronizing two WSUS servers, see Deploying Microsoft Windows Server Update Services (http://go.microsoft.com/fwlink/?linkid=79983). The name that you enter in the WSUS console on the downstream WSUS server must match the name of the upstream WSUS server.

To determine if there is a problem with network name resolution services, use the **ping** command from the downstream WSUS server that cannot synchronize. You should use the same naming convention that is used in the WSUS console. For example, if you used a NetBIOS name in WSUS console, use the NetBIOS name of the upstream server with the **ping** command. If you cannot ping the upstream server, you might have a problem with network name resolution services. To work around this type of issue, you could use a different name resolution service or the IP address of the upstream server.

**To contact an upstream WSUS server by using the ping command**

1. Click **Start**, and then click **Run**.
2. In the **Open** box, type **cmd**, and then click **OK**.
3. Type the following, and then press ENTER:

   **ping** *WSUSServerName*

   where *WSUSServerName* is the name of the upstream WSUS server with which you are trying to synchronize.

## Verify that users and the network service have Read permissions to the local update storage directory

If you store update files on your WSUS server, you need to ensure that the folder to which you download update files (by default C:\WSUS) has at least Read permissions for the network service and for users. This is true for both upstream and downstream WSUS servers.

## On a downstream WSUS server, check that the updates are available on the upstream WSUS server

There are a number of situations where the updates on the upstream server no longer match the updates being requested at synchronization by the downstream server. Some of the following are examples of when this might occur:

- An upstream WSUS server is reinstalled and the set of classifications and products the administrator selects is smaller than the set previously selected for the earlier installation. The downstream servers might then attempt to synchronize updates that the newly rebuilt upstream server has not downloaded. Synchronization will fail for updates that do not exist on the upstream server.
- A downstream server is reconfigured to get updates from a different upstream server with different products and classifications selected.

To troubleshoot this issue, make a note of the updates for which download failed on the downstream server. These will be visible on the Updates page, and marked with a red "X." Check if these updates exist on the upstream server (look at the Updates page). If they do not match, do one of the following, depending on which updates you need:

- Specify the missing updates on the upstream server, and then synchronize from the update source.
- If the failed updates are not needed, cancel and then decline the updates that are not on the upstream server
- If the missing updates are actually available on the upstream server, then the error is transient, meaning the update might have been downloaded to the upstream server after it was requested by the downstream server. This issue will resolve itself the next time the downstream server synchronizes to the upstream server.

## Restart the BITS service

If the BITS service was disabled during synchronization, synchronization will fail. To ensure that the BITS services is properly enabled, restart both the BITS service and the WSUS service.

**To restart the BITS service and the WSUS service**

1. On the WSUS server, click **Start**, point to **Administrative Tools**, and then click **Services**.
2. Right-click **Background Intelligent Transfer Service**, click **Properties**, and make sure that **Startup Type** is **Manual**. After that click **Start**.

3. Right-click **Windows Update Service**, and then click **Restart**.
4. Retry synchronization: In the WSUS console, click **Options**, click **Synchronization Options**, and then under **Tasks**, click **Synchronize now**.

You should also ensure that both the BITS and the WSUS service are set to start automatically on reboot.

### The number of updates that are approved on a parent upstream server does not match the number of approved updates on a replica server

This might occur if you have changed language settings on the parent upstream server after first synchronizing with the old language settings. For more information see "Listinactiveapprovals" in Managing WSUS 3.0 from the Command Line.

### The last catalog synchronization failed

If your last catalog synchronization failed and you see event ID 10021 or 10022, check your upstream server and proxy settings in the WSUS administration console (**Options**, then **Update Source and Proxy Server**).

### A WSUS 2.0 replica times out when synchronizing

In some cases WSUS 2.0 replica servers time out during synchronization. This issue has been fixed in WSUS 2.0 Service Pack 1 and in WSUS 3.0. See KB 910847, "Time-out error when approving multiple updates on Microsoft WSUS Server" (http://go.microsoft.com/fwlink/?LinkId=86496) for more information.

# Issues with Update Approvals

If you are having problems with approvals, use the following sections to troubleshoot the problem.

# Troubleshooting update approvals

### New approvals can take up to one minute to take effect

If you approve an update on the WSUS console and there are client computers running detection at that exact moment, those computers might not get the approved update until they go through another detection cycle. The WSUS server requires approximately one minute to begin offering newly approved updates to client computers.

### Remote computers accessed by using Terminal Services cannot be restarted by non-administrators

Non-administrators using terminal services computers will not be able to restart their computers remotely. Therefore, if a remote computer on which an update is installed needs to be restarted for the update to take effect, users without administrative permissions will be unable to complete the updating of their remote computer.

### The number of updates that are approved on a parent upstream server does not match the number of approved updates on a replica server

This might occur if you have changed language settings on the parent upstream server after first synchronizing with the old language settings. For more information see "listinactiveapprovals" in Managing WSUS 3.0 from the Command Line.

# Issues with Backup and Restore

Use the information in this section to troubleshoot issues around backing up and restoring WSUS.

# Troubleshooting backup and restore issues

### Cannot access WSUS data after restoring the database

If you restore a WSUS database but cannot access it from the WSUS administration console, check for the following:

- If you have changed the WSUS server name since the backup, you must add the server to the WSUS administration console.
- If you restore the backup to a WSUS server other than the one from which you backed up the database, you must add the server to the WSUS administration console.
- Verify that your user permissions are still valid for the database.

### Clients have download failures after restoring the database

If you are storing content locally, and the metadata in the database does not match the update files in the content directory, clients could suffer download failures when attempting to install an update listed in the database but not found in the content directory. You can resolve this problem, or prevent it from occurring, by making sure to run **wsusutil reset** after every restore procedure. For details, see the "wsusutil reset" section in Managing WSUS 3.0 from the Command Line.

# Issues with E-Mail Notifications

If you are not receiving e-mail notifications after having set up your WSUS server to send them, you should check both the WSUS server's e-mail setup and the SMTP configuration on the e-mail server.

## Troubleshooting the WSUS e-mail setup

In the WSUS administration console, click **Options**, and then click **E-Mail Notifications**. On the **E-Mail Server** tab, check the SMTP server name and port, the sender name and address, and the SMTP server authentication, if necessary. You can use the **Test** button to verify your settings.

## Troubleshooting the SMTP server

You can refer to articles such as SMTP: Troubleshooting the TCP/IP Layer of the Mail Gateway (http://go.microsoft.com/fwlink/?LinkId=81082) for more information about troubleshooting issues with the SMTP server.

# Issues with the Database

If you have problems with the SQL Server database or Windows Internal Database, make sure that the WSUS database in question is in the correct SQL instance before starting to troubleshoot SQL issues.

**Note** You will need to use the **sqlcmd** utility, which can be downloaded from Feature Pack for Microsoft SQL Server 2005 (http://go.microsoft.com/fwlink/?LinkId=81081). For more information about the **sqlcmd** utility, see sqlcmd Utility (http://go.microsoft.com/fwlink/?LinkId=81183).

# Troubleshooting database issues

## Ensure that the WSUS database is in the correct SQL instance

**To ensure that the WSUS database is in the correct SQL instance**

1. Verify the SQL server name by opening a command window and typing the following:

   **Reg query "HKLM\SOFTWARE\Microsoft\Update Services\Server\Setup" /v SqlServerName**

   The output contains the SQL server name to be used in the next step.

2. Type the following:

   **sqlcmd -S** *SqlServerName* **-E -d SUSDB**

   Review any error messages and correct the problems.

If you are using Windows Internal Database as the WSUS database, use the following string in place of *SqlServerName* in the above command:

**np:\\.\pipe\MSSQL$MICROSOFT##SSEE\sql\query**

# Issues with WSUS 3.0 Services

WSUS uses seven services. They are the Update Service (wsusservice.exe), the Reporting Web Service, the API Remoting Web Service, the Client Web Service, the Simple Web Authentication Web Service, the Server Synchronization Service, and the

DSS Authentication Web Service. This section explains how to troubleshoot these services in general.

# Troubleshooting services

## General service troubleshooting

You can use the following steps to restart services that are not functioning properly.

1. Locate the service (click **Start**, point to **Administrative Tools**, click **Services**, and then look for the service).
2. Verify that the service is running. Click **Start** if it is stopped or **Restart** to refresh the service.

You can also use the Event Viewer to check the Application, Security, and System event logs to see if there are any events that indicate a problem. You should also check the SoftwareDistribution.log to see if there are events that indicate a problem.

## Reset IIS

You should reset IIS if you suspect that there are problems with Web services.

1. Open a command window.
2. Type **iisreset**

## SQL service

The SQL service must be running for all the services except the self-update service. If any of the log files indicate SQL connection problems, check the SQL service first. To access the SQL service, click the **Start** button, point to **Administrative Tools**, click **Services**, and then look for one of the following:

- **MSSQLSERVER** (if you are using Windows Internal Database, or if you are using SQL Server and are using the default instance name for the instance name).
- **MSSQL$WSUS** (if you are using a SQL Server database and have named your database instance "WSUS").

Right-click the service, and then click **Start** if the service is not running or **Restart** to refresh the service if it is running.

### Access rights on Web service directories

Incorrectly set permissions on Web service directories can cause problems for WSUS Web services. WSUS setup will create these directories and set the access rights correctly, but subsequent developments, such as the installation of different applications or the operation of security software, may have reduced the permissions. See Appendix D: Permissions on WSUS Directories and Registry Keys for more information about the different Web service directories and the correct access rights for them.

### IIS settings for Web services

IIS must be configured correctly for WSUS Web services. WSUS setup will configure its Web services correctly, but the subsequent addition of new Web services or reconfiguration of the default Web site (if the default site is used by WSUS) may cause the configuration to change. See Appendix C: IIS Settings for Web Services for an explanation of how to check IIS configuration, as well as the correct settings on each of the Web services and for the WWW web service.

# WSUS 3.0 Client Computer Administration Issues

**In this section**



# Issues with Client Computer Groups

Use the information in this section to troubleshoot issues with client computer groups.

## Client computers appear in the wrong groups

Using Group Policy or registry settings to move computers into target groups is called client-side targeting. For more information about how to set up client-side targeting, see

Deploying Microsoft Windows Server Update Services (http://go.microsoft.com/fwlink/?linkid=79983). There are a number or reasons why computers might not appear in groups when you are using client-side targeting. Use the following information to try to resolve this problem.

## Verify that the WSUS console is set to use client-side targeting

By default the WSUS server is set to use server-side targeting. If you are using client-side targeting, you need to set an option on the WSUS server. For more information about how to set up client-side targeting, see Deploying Microsoft Windows Server Update Services (http://go.microsoft.com/fwlink/?linkid=79983).

## Verify that target computer group names match groups on the WSUS server

Make sure the name of the target computer group matches the name of the computer group on the WSUS server. Check the Group Policy object (GPO) or the registry setting where you enabled client-side targeting. Make sure that there are no discrepancies between the name of the computer group used in Group Policy and the name of the group used on the server. If WSUS cannot find a computer group on the server reported by a client computer, the computer will appear in the Unassigned Computers group.

## Reset the Automatic Update client

If you make a change to group membership by using client-side targeting, you can reset the Automatic update client with the wuauclt utility. For more information about **wuauclt**, see Appendix H: The wuauclt Utility.

**To reset the Automatic Update client**

1. Open a command window.
2. Type **wuauclt.exe /resetauthorization /detectnow**
3. Wait 10 minutes for the detection cycle to finish.

# Issues with Update Installation on Clients

If WSUS clients are not installing updates, there may be issues with DCOM configuration. You will see event ID 10311 or 10312 in the application log if this is the case.

# Troubleshooting update installation issues

## Checking DCOM configuration

The process of checking DCOM configuration is slightly different on different operating systems.

**To check DCOM configuration on Windows 2000**

1. Open a command window.
2. Type the following command: **dcomcnfg**(the **Distributed COM Configuration Properties** window will appear).
3. Select the **Default Properties** tab.
4. Make sure that Enable **Distributed COM on this computer** is selected.
5. Make sure that **Default Impersonation Level** is set to **Identify**.
6. Click **OK**, and then close the DCOM window.

**To check DCOM configuration on Windows Vista and Windows XP**

1. Open a command window.
2. Type the following command: **dcomcnfg**The **Component Services** window will appear.
3. Right-click **My Computer**, click **Properties**.
4. Click the **Default Properties** tab.
5. Make sure that **EnableDistributed COM on this computer** is selected.
6. Make sure that **Default Impersonation Level** is set to **Identify**.
7. Click **OK**, and then close the **Component Services** window.

### Checking the default DCOM permissions

Default DCOM permissions can also be a source of problems.

**To remove default DCOM permissions**

1. Open the **Registry Editor**.
2. Navigate to HKLM/SOFTWARE/Microsoft/Ole.
3. If there is a **DefaultAccessPermission** key, delete it.

# Clients Not Reporting

If you have configured clients for a particular WSUS server, but they have not reported over a period of days, you should try the steps below to isolate and repair the problem.

## Troubleshooting client not reporting issues

### Check the HTTP hotfix

Some clients have been affected by a known issue with Windows Server 2003 http.sys and IIS. In some cases this transient issue will prevent clients from checking in, because they receive incorrect responses from the server after a number of attempts. Further information about the issue can be found at FIX: IIS 6.0 may send an "HTTP 100 Continue" response in the middle of the response stream when you send a POST request (http://go.microsoft.com/fwlink/?LinkId=80715).

**Note**

Failure of clients to contact the server is not related to compression. Administrators should not disable IIS compression, because allowing noncompressed data can increase network traffic and server load, while reducing the number of clients that can be served effectively.

### Troubleshoot client connectivity

Ensure that the client connection to the WSUS server is working properly.

**To troubleshoot client connectivity**

1. Open a command window.
2. Verify that the client has a valid IP address. Type **ipconfig /all**
3. Contact the WSUS server: **ping***WSUSServerName*
4. Contact the WSUS HTTP server. Open Internet Explorer and in the Address bar type: **http://***WSUSServerName***:***portNumber* where *WSUSServerName* is the name of the WSUS server, and *portNumber* is the port that has been configured for it (for example, 80 for HTTP, 443 for SSL, and 8530 for a custom port).
5. Verify the existence of the self-update tree. In an Internet Explorer Address bar type **http://***WSUSServerName***/selfupdate/wuident.cab**
6. If the WSUS server is functioning properly, you should see a **File Download** window asking you whether to open or save the file. Close the window.

**Note**

If you do not see the **File Download** window in step 6 above, make sure that the client self-update tree has been configured properly. For more information, see Issues with Client Self-Update.

## Troubleshoot the Automatic Update client

Ensure that the Automatic Update client has been configured correctly.

**To troubleshoot the Automatic Update client**

1. Open a command window.
2. Type:**reg query HKLM\SOFTWARE\Policies\Microsoft\Windows\WindowsUpdate**

   You should see output like the following if the client has been configured to get its updates from a WSUS server:

```
HKEY_LOCAL_MACHINE\SOFTWARE\Policies\Microsoft\Windows\WindowsUpdate
WUServer    REG_SZ  http://WSUSServerName
WUStatusServer      REG_SZ  http://WSUSServerName
HKEY_LOCAL_MACHINE\SOFTWARE\Policies\Microsoft\Windows\WindowsUpdate\AU
```

   You should see output similar to the following if Automatic Update is functioning, but the client has not been configured to get its updates from a WSUS server:

```
HKEY_LOCAL_MACHINE\SOFTWARE\Policies\Microsoft\Windows\WindowsUpdate
HKEY_LOCAL_MACHINE\SOFTWARE\Policies\Microsoft\Windows\WindowsUpdate\AU
```

If the query returns the error, "The system was unable to find the specified registry key or value," Automatic Update has not been configured on this computer.

### Reset the Automatic Update client

It can be a good idea to reset the Automatic Update client if you are experiencing difficulty with contacting the WSUS server with the wuauclt utility. For more information about wuauclt, see Appendix H: The wuauclt Utility.

**To reset the Automatic Update client**

1. Open a command window.
2. Type **wuauclt.exe /resetauthorization /detectnow**
3. Wait 10 minutes for the detection cycle to finish.

# Issues with Client Self-Update

WSUS uses IIS to update most computers to the WSUS-compatible Automatic Update. This process is called client self-update. To accomplish client self-update, WSUS Setup creates a virtual directory under the WSUS Web site named Selfupdate. This virtual directory holds the WSUS-compatible Automatic Updates. This is called the self-update tree.

Using Group Policy to point client computers to your WSUS server should eventually cause an Automatic Updates detection and client self-update. For more information about this process, see Deploying Microsoft Windows Server Update Services (http://go.microsoft.com/fwlink/?linkid=79983).

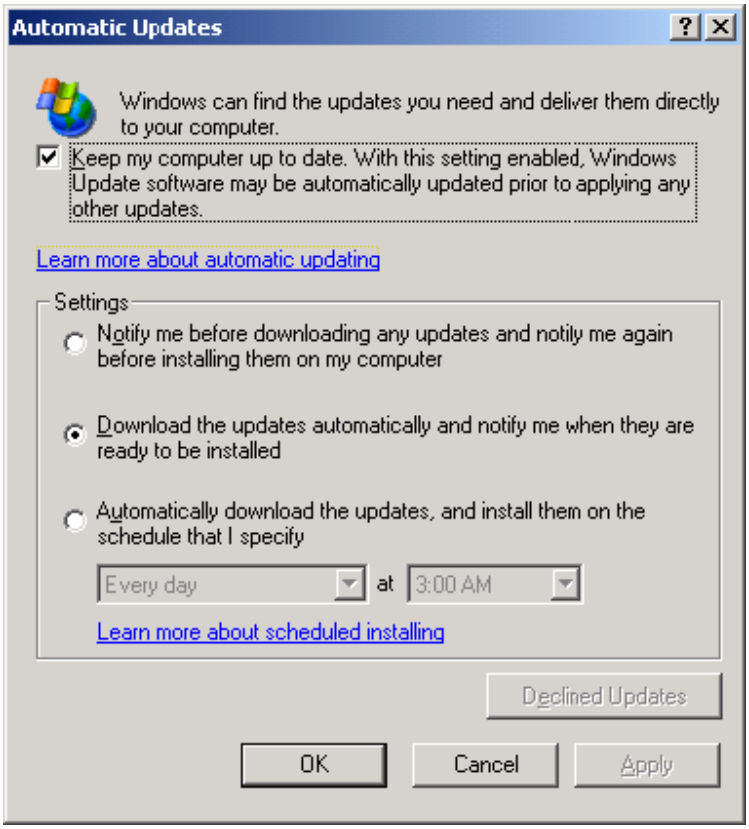
# Troubleshooting client self-update issues

If the client self-update does not work automatically, use the following suggestions to troubleshoot the problem.

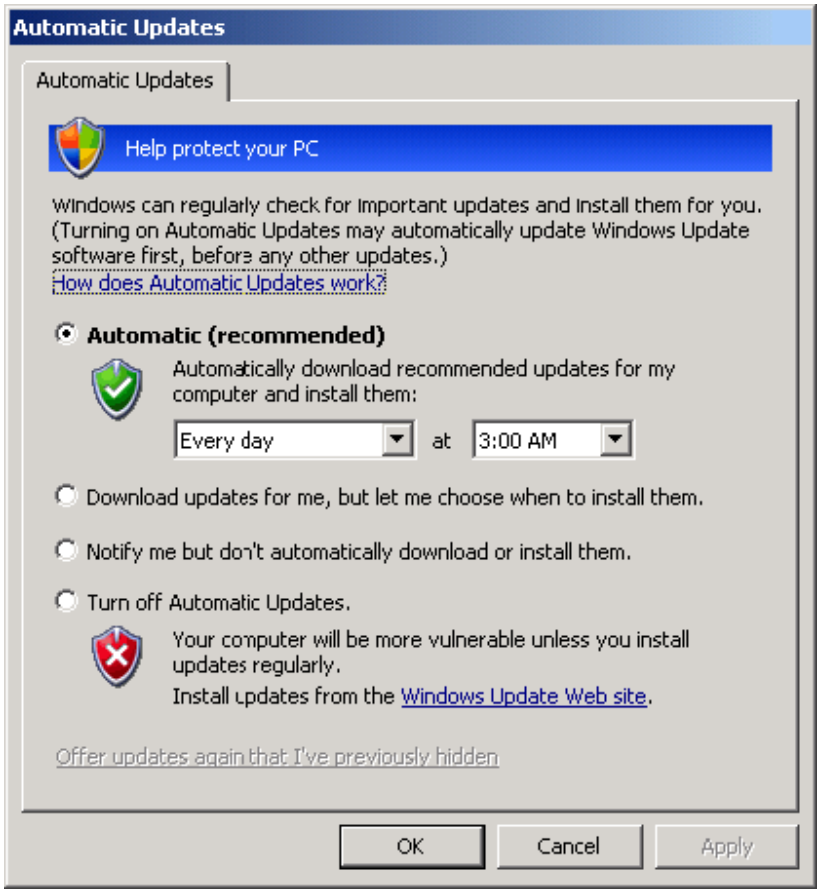
## How to differentiate between the SUS client and WSUS client

Use the Automatic Updates user interface to differentiate between the SUS and WSUS clients. The following illustrations show the user interface of the SUS and WSUS clients.

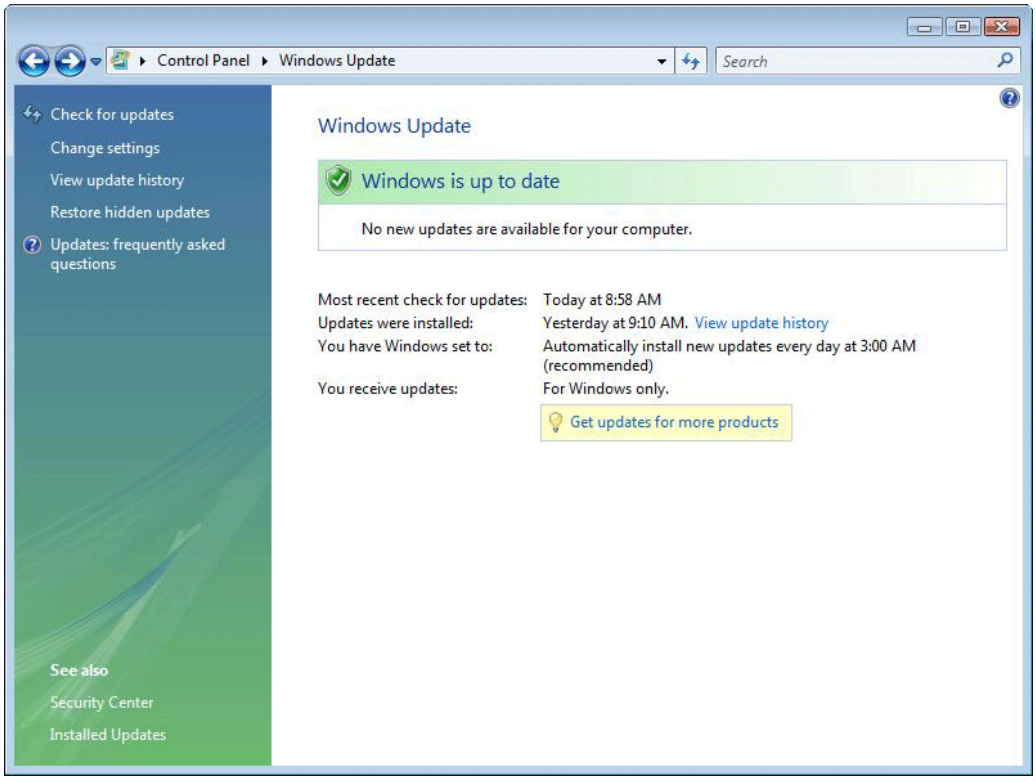
### SUS Client



**WSUS Client (Windows XP)**



**WSUS Client (Windows Vista)**




## Verify that the client software in your organization can self-update

Some computers might already have the WSUS client installed. Other computers might have a version of Automatic Updates that is incapable of performing self-update. For more information see Deploying Microsoft Windows Server Update Services (http://go.microsoft.com/fwlink/?linkid=79983). If the clients in your organization are capable of and require self-update but are still not self-updating, see the next section.

## Verify that SUS clients are pointed to the WSUS server

If you have the WSUS client installed but the client computer is pointed to a SUS server, Automatic Updates falls into legacy mode and the client computer uses the SUS client user interface. In this case you need to redirect the computer away from the SUS server to get the WSUS client to function. When you point Automatic Updates to a WSUS server, the WSUS client user interface appears.

If your client computers are pointed to the WSUS server and you do not see the WSUS client user interface shown above, see the next section.

## Check for the self-update tree on the WSUS server

WSUS Setup creates a virtual directory named Selfupdate under the Web site running on port 80 of the computer where you install WSUS. This virtual directory, called the self-update tree, holds the latest WSUS client. For this reason, you must have a Web site running on port 80, even if you put the WSUS Web site on a custom port. The Web site on port 80 does not have to be dedicated to WSUS. WSUS uses the site on port 80 only to host the self-update tree.

To ensure that the self-update tree is working properly, first make sure there is a Web site set up on port 80 of the WSUS server. After that you should run the WSUS script that ensures a proper configuration of self-update on port 80. Open a command window on the WSUS server and type the following:

**cscript** *WSUSInstallDirectory***\setup\installselfupdateonport80.vbs**

where *WSUSInstallDirectory* is the directory in which WSUS is installed. If the script is successful, you should see the following output:

```
Microsoft (R) Windows Script Host Version 5.6
Copyright (C) Microsoft Corporation 1996-2001. All rights reserved.

SetupSelfupdateTree: Finding the index of the Web site on which WUS is
installed...
SetupSelfupdateTree: Leaving GetWUSWebSiteIndex.
SetupSelfupdateTree: Finding the index of the web site bound to port 80...
SetupSelfupdateTree: iWebSiteIndex: 1 ServerBindings: :80:index: 0
SetupSelfupdateTree: Found the index of site on Port 80: 1
SetupSelfupdateTree: rootMetabasePath: IIS://LocalHost/W3SVC/1/ROOT
SetupSelfupdateTree: szPort80RootPath=c:\inetpub\wwwroot
SetupSelfupdateTree: iWusWebSiteIndex=1 iPort80WebSiteIndex=1
SetupSelfupdateTree: Warning: This is standalone WUS install. No need to do
configuration for SxS install.
Success: InstallSelfupdateOnPort80 succeeded.
```

If you have WSUS client self-update running on port 80 of the WSUS server, see the next section.

## Check IIS logs on the WSUS Server

Check the IIS logs on the WSUS server. IIS logs are typically located in *%windir%*\system32\LogFiles\W3SVC1 for the default Web site. Typical errors might be

404 (file not found) 401/403 (authentication/access), and 500 (Internal server error). Use IIS Help to troubleshoot any problems found in the IIS logs.

## If you have installed Windows SharePoint Services on the default Web site in IIS, configure it to coexist with Self-update

If you install Windows SharePoint Services on the same server that is running WSUS, you might see the following issues:

- An "Access denied" message appears when Automatic Updates tries to update itself, and the latest Automatic Updates will not be running.
- A message appears warning you that the SelfUpdate service is not available.

If client computers are not running the WSUS-compatible version of Automatic Updates, they will not be able to receive updates through WSUS.

**To resolve this issue**

1. Grant Anonymous access (Anonymous Auth) to the Default Web site, ClientWebService and Selfupdate v-roots in IIS.
2. Exclude specific requests from being intercepted by the Windows SharePoint Services ISAPI DLL by doing the following:
    a. Open the Windows SharePoint Services Central Administration Site (click **Start**, point to **Administrative Tools**, and then click **Sharepoint Central Administration**).
    b. Click **Virtual Server Configuration**, and then click **Configure Virtual Server Settings**.
    c. Click **Default Web Site**.
    d. Click **Virtual Server Management**, and then click **Define managed paths**.
    e. In the **Add a new path** box, set the type to **Excluded Path**. Under **Path**, type the following:
    - **/iuident.cab**
    - **/clientwebservice**
    - **/Selfupdate**

For more information, see KB 828810, "How to enable an ASP Net application to run on a SharePoint virtual server" (http://go.microsoft.com/fwlink/?LinkId=81417).

## Check network connectivity on the WSUS client computer

Check network connectivity on the WSUS client computer. Use Internet Explorer to determine whether self-update files on the WSUS server are accessible to the client computer. If you perform the following procedure and are prompted to download or open the files, you have verified network connectivity. If you do not have access to these files, there are problems with network connectivity between the WSUS server and the client computer.

**To check network connectivity on the WSUS client computer**

1. Open Internet Explorer.
2. In the **Address** bar, type:

   **http://***WSUSServerName***/selfupdate/wuident.cab**

   where *WSUSServerName* is the name of the WSUS server. You should be prompted to download or open wuident.cab. This verifies network connectivity from the WSUS client and the availability of the wuident.cab file on the WSUS server. If you do not have connectivity or the Web site is not configured correctly, you will get an HTTP error. Check the network settings of the WSUS server and any proxy servers.
3. If there are any boxes prompting you to download or save, click **Cancel**.

If you are prompted to save or download both of these files, see the next section.

## Check logs on the WSUS client computer

Check the *%windir%*\WindowsUpdate.log on the client computer to see if there has been any activity or any attempts to contact the server, such as cached server pingbacks. If you can find no problem with the logs on the WSUS client, see the next section.

## Manipulate registry settings on the WSUS client computer

If all else has failed, you can attempt to manually manipulate registry settings to get the client computer to self-update to the WSUS client.

**To manually manipulate registry settings on the SUS client computer**

1. Click **Start**, then **Run**, and type **regedit**, and then click **OK**.
2. In Registry Editor, navigate to the **WindowsUpdate** key by expanding the following:

   **HKEY_LOCAL_MACHINE\Software\Policies\Microsoft\Windows**

If the **WindowsUpdate** key does not exist, you need to add it.

3. On the menu, click **Edit**, point to **New**, and then click **Key**.
4. Type **WindowsUpdate** as the name for the new key.
5. Double-click the **WUServer** setting, type the URL to your WSUS server, and then press ENTER.

   If the **WUServer** setting does not exist, you need to add it.

   On the menu, click **Edit**, point to **New**, and then click **String Value**.
6. Type **WUServer** as the setting name.
7. Double-click the **WUStatusServer** setting, type the URL to your WSUS server, and then press ENTER.

   If the **WUStatusServer** setting does not exist, do the following:

   On the menu, click **Edit**, point to **New**, and then click **String Value**.
8. Type **WUStatusServer** as the setting name.
9. Navigate to the following:

   **HKEY_LOCAL_MACHINE\Software\Policies\Microsoft\Windows\WindowsUpdate\AU**

   If the **AU** key does not exist, do the following:

   On the menu, click **Edit**, point to **New**, and then click **Key**.
10. Type **AU** as the name for the new key.
11. Verify that the **UseWUServer** setting has a value of 1 (0x1). If it does not, modify it by double-clicking the setting and then changing the value.

    If the **UseWUServer** setting does not exist, do the following:

    On the menu, click **Edit**, point to **New**, and then click **DWORD Value**.
12. Type **UseWUServer** for the setting name.
13. Navigate to the following:

    **HKEY_LOCAL_MACHINE\Software\Microsoft\Windows\CurrentVersion\WindowsUpdate\Auto Update**
14. Enable and configure Automatic Updates through Control Panel:

    Click **Start**, click **Control Panel**, and then double-click **Automatic Updates**.
15. In the **Automatic Updates** dialog box, specify download and installation options, and then click **OK**. Make sure that **Turn off Automatic Updates** is not selected.

16. Ensure that the **AUState** setting has a value of 2 (0x2). If it does not, modify it by double-clicking and changing the value.
17. If the **LastWaitTimeout** setting exists, delete it.
18. If the **DetectionStartTime** setting exists, delete it.
19. Close the Registry Editor.

**To force the WSUS client computer to check with the WSUS server**

1. At the command prompt, stop the Automatic Updates service by typing the following, and then pressing ENTER:

   **net stop wuauserv**
2. At the command prompt, restart the Automatic Updates service by typing the following, and then pressing ENTER:

   **net start wuauserv**
3. The self-update should occur in six to ten minutes.
4. Wait approximately one minute, and then refresh the registry. You should now see the following settings and values:
   - **DetectionStartTime (REG_SZ) YYYY.MM.DD HH.MM.SS**. The **DetectionStartTime** value is written in local time, but the detection actually occurs 5 minutes after the time noted.
   - **LastWaitTimeout (REG_SZ) YYYY.MM.DD HH.MM.SS**. The **LastWaitTimeout** value is written in GMT or Universal Time, and represents the actual time that detection occurs.

Although these values refer to the time that detection is going to start, the first phase of detection is the process of checking whether a self-update is necessary. Therefore, these values actually refer to the time that the self-update from SUS client to the WSUS client should occur.

If the client software has not self-updated after ten minutes, refresh the **\Auto Update** registry key. If the **LastWaitTimeout** value has changed and is now 24 hours later than its previous value, that indicates that Automatic Updates was not able to contact the server URL that you specified in the **WUServer** value.

You should also check the functioning of the Client Web Service. See Issues with WSUS 3.0 Services for more information.

# Issues with BITS

Background Intelligent Transfer Service (BITS) is the service used by WSUS to download updates from Microsoft Update to the main WSUS server, as well as from WSUS servers to their clients. BITS also supports the transfer of files between peer computers in a domain.

Some download issues may be caused by problems with running BITS on the server or client computers. When you are troubleshooting download problems, after you have verified that all WSUS settings are correct on both the server and its clients, you should ensure that BITS is running properly on all affected computers.

BITS provides a downloadable tool called bitsadmin that allows you to verify and change BITS settings. For more information about the bitsadmin utility, see BITSAdmin Tool (http://go.microsoft.com/fwlink/?LinkId=80934). This tool is available as part of the Windows Vista operating system, and also as part of the Windows XP Service Pack 2 Support Tools.

# Finding BITS

To find the BITS service, open a command shell and type:

```
sc query bits
```

If BITS is running, you should see output like the following:

```
SERVICE_NAME: bits
TYPE               : 20  WIN32_SHARE_PROCESS
 STATE              : 4  RUNNING
                         (STOPPABLE,NOT_PAUSABLE,ACCEPTS_SHUTDOWN)
 WIN32_EXIT_CODE    : 0  (0x0)
 SERVICE_EXIT_CODE  : 0  (0x0)
 CHECKPOINT         : 0x0
 WAIT_HINT          : 0x0
```

If BITS is not running, you should see output like the following:

```
SERVICE_NAME: bits
 TYPE               : 20  WIN32_SHARE_PROCESS
 STATE              : 1  STOPPED
                         (NOT_STOPPABLE,NOT_PAUSABLE,IGNORES_SHUTDOWN)
 WIN32_EXIT_CODE    : 0  (0x0)
 SERVICE_EXIT_CODE  : 0  (0x0)
 CHECKPOINT         : 0x0
 WAIT_HINT          : 0x0
```

# Stopping and restarting BITS

Often it is possible to resolve BITS issues simply by stopping the service and restarting it. The following procedure shows how to stop and restart the service from the command line. You must be logged on as a local administrator to stop and restart BITS.

**Note**

To modify, stop, or restart BITS, you must be logged on as an administrator.

**To stop and restart BITS**

1. Open a command shell.
2. Type **sc stop bits**
3. Type **sc start bits**

# Troubleshooting BITS download issues

The following sections are an incomplete list of possible problems with BITS configuration. To get more information about BITS, see Background Intelligent Transfer Service (http://go.microsoft.com/fwlink/?LinkId=81083).

## The BITS service must run under the Local System user account

By default BITS runs under the LocalSystem account.

**To configure the service to run under the correct account**

1. Open a command shell.

   Type: `sc config bits obj= LocalSystem`

   (note that a space must occur between `obj=` and `LocalSystem`)
2. Verify that output from the command is:

   [SC] ChangeServiceConfig SUCCESS
3. Stop and restart BITS.

## Proxy servers must support HTTP 1.1 RANGE requests

- BITS supports HTTP and HTTPS downloads and uploads and requires that the server support the HTTP 1.1 protocol. For downloads, the HTTP server's HEAD method must return the file size, and its GET method must support the Content-Range and Content-Length headers. BITS can use an HTTP/1.0 server as long as it meets the HEAD and GET method requirements (MIME headers must include the standard Content-Range and Content-Type headers plus a maximum of 180 bytes of other headers, and a maximum of two CR/LF characters may occur between the HTTP headers and the first boundary string).

## There is a mismatch between the BITS per-user job limit and the per-computer job limit

**To detect or correct a mismatch between the per-user job limit and the per-computer job limit specified through Group Policy**

1. Run gpedit.msc, if the policy is specified locally; if the policy is a domain policy edit the Group Policy object with GPMC.
2. In the Group Policy Object Editor, navigate to Computer Configuration\Administrative Templates\Network\Background Intelligent Transfer Service (BITS).
3. Ensure that the setting "Maximum number of BITS jobs for each user" is set to a lower value than the setting "Maximum number of BITS jobs for this computer"
4. Type **gpupdate /force**
5. Stop and restart BITS.
6. Verify that there are no errors in the event logs.

## BITS jobs are failing

If BITS jobs fail, look in the event log to find errors. You can use the following table to diagnose the cause of the errors.

| Error name | Error code | Description |
|---|---|---|
| E_INVALIDARG | 0x80070057 | An incorrect proxy server name was specified in the user's Internet Explorer proxy settings. This error is also seen when credentials are supplied for authentication schemes that are not NTLM/Negotiate, but the user name or password is null. Change the user's IE settings to be a valid proxy server or Change the credentials not to be NULL user name/password for schemes other than NTLM/Negotiate. |
| ERROR_WINHTTP_NAME_NOT_RESOLVED | 0x80072ee7 | The server/proxy could not be resolved by BITS. Internet Explorer on the same machine in the context of the job owner would see the same problem. Try downloading the same file via the web browser using the context of the job owner. |

| Error name | Error code | Description |
|---|---|---|
| ERROR_HTTP_INVALID_SERVER_RESPONSE | 0x80072f78 | This is a transient error and the job will continue downloading. |
| BG_E_INSUFFICIENT_RANGE_SUPPORT | 0x80200013 | BITS uses range headers in HTTP requests to request parts of a file. If the server or proxy server doesn't understand Range requests and returns the full file instead of the requested range, BITS puts the job into the ERROR state with this error. Capture the network traffic during the error and examine if HTTP GET requests with "Range" header are getting valid responses. Check proxy servers to ensure that they are configured correctly to support Range requests. |

| Error name | Error code | Description |
|---|---|---|
| BG_E_MISSING_FILE_SIZE | 0x80200011 | When BITS sends a HEAD request and the server/proxy does not return Content-Length header in the response, BITS puts the job in ERROR state with this error. Check the proxy server and WSUS server to ensure that they are configured correctly. Some versions of the Apache 2.0 proxy server are known to exhibit this behavior. |
| BG_E_HTTP_ERROR_403 | 0x80190193 | When the server returns HTTP 403 response in any of the requests, BITS puts the job in ERROR state with this error code. HTTP 403 corresponds to “Forbidden: Access is denied." Check access permissions for the account running the job. |

| Error name | Error code | Description |
|---|---|---|
| ERROR_NOT_LOGGED_ON | 0x800704dd | The SENS service is not receiving user logon notifications. BITS (version 2.0 and up) depends on logon notifications from Service Control Manager, which in turn depends on the SENS service. Ensure that the SENS service is started and running correctly. |

### BITS fails to start

If the BITS service fail to start, use the following table to diagnose the cause of the error.

| | | |
|---|---|---|
| ERROR_SERVICE_DOES_NOT_EXIST | 0x80070424 | See the section on repairing the BITS configurati |
| ERROR_SERVICE_NOT_IN_EXE | 0x8007043B | BITS is not listed as one of the services in the ne (does not apply to Windows 2000). |
| ERROR_SERVICE_DISABLED | 0x80070422 | BITS has been disabled. Enable the BITS service |
| ERROR_SERVICE_DEPENDENCY_DELETED<br>ERROR_SERVICE_DEPENDENCY_FAIL | 0x80070433,<br>0x8007042c | A service appearing in the BITS service depende started. Make sure the dependency list for the BI<br>• Windows Vista: RpcSs, EventSystem (also h LanManWorkstation when peercaching is ena<br>• Windows Server 2003: Rpcss, EventSystem<br>• Windows XP: Rpcss<br>• Windows 2000: Rpcss, SENS, Wmi |

| | | |
|---|---|---|
| ERROR_PATH_NOT_FOUND | 0x80070003 | Pre-Windows Vista: %ALLUSERSPROFILE%\Mi exist |
| ERROR_FILE_NOT_FOUND | 0x80070002 | The “Parameters” key is missing. Ensure that the values exist: HKLM\SYSTEM\CurrentControlSet\Services\BITS %SystemRoot%\System32\qmgr.dll |
| REGDB_E_CLASSNOTREG, EVENT_E_INTERNALERROR | 0x80040154, 0x80040206 | BITS for Windows 2000 is dependent on SENS a services. If the COM+ catalog is corrupted, BITS code. See KB article Q315296 for details. |

## Repairing a corrupted BITS configuration

To repair corrupted BITS service configuration, you can enter the BITS service configuration manually.

**Important**

This action should only be taken in circumstances where all other troubleshooting attempts have failed. You must be an administrator to modify the BITS configuration.

**To repair a corrupted BITS configuration**

1. Open a command shell.
2. Type:

   Sc config bits binpath=”%systemroot%\system32\svchost.exe –k netsvcs“ Sc config bits depend = RpcSs

   Sc config bits start=delayed-auto

   Sc config bits type=interact

   Sc config bits error=normal

   Sc config bits obj=LocalSystem

   Sc privs bits privileges=SeCreateGlobalPrivilege/SeImpersonatePrivilege/SeTcbPrivilege/SeAssignPrimaryTokenPrivile

   Sc sidtype bits type= unrestricted

   Sc failure bits reset= 86400 actions=restart/60000/restart/120000
3. Stop and restart BITS.

# Issues with High CPU Utilization

Clients may notice very high (approaching 100 percent) CPU utilization for a few minutes, especially after rebooting. The symptoms have been reported for clients running Microsoft Office 2003. There is an update for this issue described by FIX: When you run Windows Update to scan for updates that use Windows Installer, including Office updates, CPU utilization may reach 100 percent for prolonged periods (http://go.microsoft.com/fwlink/?LinkId=80817).

# Additional Resources for Windows Server Update Services 3.0

For more information and support, see the following resources.

## Windows Server Update Services communities

Microsoft communities are great places to exchange ideas with other users and discuss common issues. You can read and write messages by using an NNTP-based newsreader such as Microsoft Outlook Express. You can also use the Web-based newsreader provided by Microsoft to access all of the newsgroups. To access the WSUS Communities, go to Windows Server Update Services Communities Homepage (http://go.microsoft.com/fwlink/?LinkID=45215)

## More Documentation

- For step-by-step guidance for getting started, including installing WSUS, setting up a client computer, and deploying your first set of updates, see Step-by-Step Guide to Getting Started with Microsoft Windows Server Update Services (http://go.microsoft.com/fwlink/?LinkID=41774).
- For information about planning for, installing, and then configuring WSUS components and infrastructure, see Deploying Microsoft Windows Server Update Services (http://go.microsoft.com/fwlink/?linkid=79983).

- For information that helps you automate tasks or customize WSUS, see the Microsoft Windows Server Update Services Software Developer's Kit (http://go.microsoft.com/fwlink/?LinkID=43099) and Windows Update Agent Software Developer's Kit (http://go.microsoft.com/fwlink/?LinkID=43101). Note that the Windows Update Agent is the Automatic Updates service. Both SDKs contain information about the application programming interface (API), as well as sample scripts and ready-to-use tools for your WSUS deployment and implementation.

# Appendix A: Uninstalling Windows Internal Database

It is not usually necessary to uninstall Windows Internal Database, which WSUS installs as the default SQL Server version. It is not possible to remove this application with **Add or Remove Programs**, and it will not be uninstalled automatically when WSUS is uninstalled. If you wish to do so, you will need to call the **msiexec** executable with the correct key for the operating system platform.

**Important**

Uninstalling Windows Internal Database is not recommended, because it may affect other applications that may be using the same database instance (such as Windows SharePoint Services).

**To uninstall Windows Internal Database**

1. Open a command shell.
2. Call **msiexec** with the correct key for the operating system platform.
   - On 32-bit platforms**: msiexec /x {CEB5780F-1A70-44A9-850F-DE6C4F6AA8FB} callerid=ocsetup.exe**
   - On 64-bit platforms: **msiexec /x {BDD79957-5801-4A2D-B09E-852E7FA64D01} callerid=ocsetup.exe**

**Important**

The removal of the application may not remove the default .mdb and .ldb files, which will cause a subsequent WSUS 3.0 installation to fail. These files can be deleted from the %windir%\SYSMSI\SSEE directory.

# Appendix B: Uninstalling WSUS 3.0 from SQL Server

Read the following information before uninstalling WSUS.

## Uninstalling WSUS might leave some WSUS accounts on computers running SQL Server

Local SQL Server accounts that are created by WSUS Setup are not removed by the WSUS uninstall component. The WSUS uninstall component does not remove the Network Service and ASP.NET accounts from the local computer running SQL Server. If some other application or database is using these accounts, this ensures that these applications or databases do not fail. If you are sure that no other application or database requires the Network Service or ASP.NET accounts, you can manually remove them from the computer running SQL Server.

For information about how to manually remove Network Service or ASP.NET accounts from a computer running SQL Server 2005 or Windows Internal Database, see SQL Server product documentation. You can download product documentation for SQL Server at SQL Server Books Online (http://go.microsoft.com/fwlink/?LinkId=81092).

# Appendix C: IIS Settings for Web Services

Troubleshooting WSUS Web services may be simplified if you compare your current IIS settings for the different WSUS Web services with the ones given below, which are the ones set by WSUS setup. A service may have stopped working correctly because one of these settings was changed by another installation or application.

The values of these IIS settings are sometimes represented with variable names instead of actual values. This is because the actual value may vary from one installation to another.

The variable names used in the settings, and in the instructions below, are:

- *windir*-: The standard environment variable for the Windows directory (on Windows Server 2003, usually C:\WINDOWS).
- *InetpubDir*-: The IIS inetpub directory on Windows Server 2003 (usually C:\Inetpub).

- *WSUSInstallDir*-: The directory where WSUS is installed (usually C:\Program Files\Update Services).
- *WebSiteID*-: The number IIS uses to identify Web sites (1 is the ID of the default Web site, but other Web sites are assigned random numbers).

# IIS vroots

The following virtual directories (vroots) are created in IIS (in the Default Web Site by default) for client-to-server synchronization, server to server synchronization, reporting, and client self-update.

| Vroot in IIS | Properties |
|---|---|
| ClientWebService | Directory: %ProgramFiles%Update Services\WebServices\ClientWebService<br>Application Pool: WsusPool<br>Security: Anonymous Access Enabled<br>Execute Permissions: Scripts Only |
| Content | Directory[the location of the WSUS content directory]<br>Security: Anonymous Access Enabled<br>Execute Permissions: None |
| DssAuthWebService | Directory: %ProgramFiles%Update Services\WebServices\DssAuthWebService<br>Application Pool: WsusPool<br>Security: Anonymous Access Enabled<br>Execute Permissions: Scripts Only |
| Inventory | Directory: %ProgramFiles%Update Services\ Inventory<br>Application Pool: WsusPool<br>Security: Anonymous Access Enabled<br>Execute Permissions: Scripts Only |

| Vroot in IIS | Properties |
|---|---|
| ReportingWebService | Directory: %ProgramFiles%Update Services\WebServices\ReportingWebService<br>Application Pool: WsusPool<br>Security: Anonymous Access Enabled<br>Execute Permissions: Scripts Only |
| ServerSyncWebService | Directory: %ProgramFiles%Update Services\WebServices\ServerSyncWebService<br>Application Pool: WsusPool<br>Security: Anonymous Access Enabled<br>Execute Permissions: Scripts Only |
| SimpleAuthWebService | Directory: %ProgramFiles%Update Services\WebServices\SimpleAuthWebService<br>Application Pool: WsusPool<br>Security: Anonymous Access Enabled<br>Execute Permissions: Scripts Only |
| ApiRemoting30 | Directory: %ProgramFiles%Update Services\Administration<br>Application Pool: WsusPool<br>Security: Integrated Windows Authentication, Digest Authentication<br>Execute Permissions: Scripts Only |
| SelfUpdate | Directory: %ProgramFiles%Update Services\SelfUpdate<br>Security: Anonymous Access Enabled<br>Execute Permissions: Scripts Only |

# Using the adsutil IIS utility

The adsutil IIS utility can be found on your server in the *InetpubDir*\AdminScripts directory. Information about how to use this utility can be found at one of the following locations:

- If product documentation is installed on your local computer, in the localhost directory at http://localhost/iishelp/iis/htm/adminsamples/adsutil.htm.
- Otherwise, in the online documentation (http://go.microsoft.com/fwlink/?LinkID=77230).

# Finding Web service paths with adsutil

You can use adsutil to find the paths for different Web services on your computer with the following procedure.

**To find the paths of Web services**

1. Open a command window.
2. Navigate to the directory where adsutil is located: **cd %Inetpubdir%\AdminScripts**
3. Type the following command: **adsutil.vbs find path**
4. If you have WSUS installed, you should see output like the following:

**Property path found at:**

**W3SVC/***WebSiteID***/ROOT**

**W3SVC/***WebSiteID***/ROOT/ApiRemoting30**

**W3SVC/***WebSiteID***/D/ROOT/ClientWebService**

**W3SVC/***WebSiteID***/ROOT/Content**

**W3SVC/***WebSiteID***/ROOT/DssAuthWebService**

**W3SVC/***WebSiteID***/ROOT/Inventory**

**W3SVC/***WebSiteID***/ROOT/ReportingWebService**

**W3SVC/***WebSiteID***/ROOT/Selfupdate**

**W3SVC/***WebSiteID***/ROOT/ServerSyncWebService**

**W3SVC/***WebSiteID***/ROOT/SimpleAuthWebService**

**Note**

If you have installed WSUS on the default Web site, *WebSiteID* will be 1, but if you have installed it on another Web site, *WebSiteID* will be a random number.

# Checking the properties of a Web service

You can also use adsutil to find the properties of a given Web service. You will use one of the Web service paths listed above to specify the Web service you want to check. For example, if you want to check the properties of the Reporting Web service, you use the path **W3SVC/***WebSiteID***/ROOT/ReportingWebService**, where *WebSiteID* stands for the number of the WSUS Web site.

**To check the properties of a Web service**

1. Open a command window.
2. Navigate to the directory where adsutil is located: **cd** *Inetpubdir***\AdminScripts**
3. Type the following command: **adsutil.vbs enum** *WebServicePath*where *WebServicePath* stands for the path of the Web service you want to check.
4. Compare the output to the standard values given in the sections below.

# Global properties

These global properties can be retrieved with the following adsutil command:

**adsutil.vbs enum W3SVC**

The properties listed below are a partial list.

| Property | Value |
|---|---|
| KeyType | (STRING) "IIsWebService" |
| MaxConnections | (INTEGER) 4294967295 |
| AnonymousUserName | (STRING) "IUSR_<machinename>" |
| ConnectionTimeout | (INTEGER) 120 |
| AllowKeepAlive | (BOOLEAN) True |
| DefaultDoc | (STRING) "Default.htm,Default.asp,index.htm" |

| Property | Value |
|---|---|
| CacheISAPI | (BOOLEAN) True |
| CGITimeout | (INTEGER) 300 |
| ContentIndexed | (BOOLEAN) True |
| DownlevelAdminInstance | (INTEGER) 1 |
| AspBufferingOn | (BOOLEAN) True |
| AspLogErrorRequests | (BOOLEAN) True |
| AspScriptErrorSentToBrowser | (BOOLEAN) True |
| AspScriptErrorMessage | (STRING) "An error occurred on the server when processing the URL. Please contact the system administrator" |
| AspAllowOutOfProcComponents | (BOOLEAN) True > |
| AspScriptFileCacheSize | (INTEGER) 500 |
| AspDiskTemplateCacheDirectory | (EXPANDSZ) "%windir%\system32\inetsrv\ASP Compiled Templates" |
| AspMaxDiskTemplateCacheFiles | (INTEGER) 2000 |
| AspScriptEngineCacheMax | (INTEGER) 250 |
| AspScriptTimeout | (INTEGER) 90 |
| AspSessionTimeout | (INTEGER) 20 |
| AspEnableParentPaths | (BOOLEAN) False |
| AspAllowSessionState | (BOOLEAN) True |
| AspScriptLanguage | (STRING) "VBScript" |
| AspExceptionCatchEnable | (BOOLEAN) True<br> |
| AspCodepage | (INTEGER) 0 |
| AspLCID | (INTEGER) 2048 |
| AspQueueTimeout | (INTEGER) 4294967295 |
| AspEnableAspHtmlFallback | (BOOLEAN) False |
| AspEnableChunkedEncoding | (BOOLEAN) True |

| Property | Value |
|---|---|
| AspEnableTypelibCache | (BOOLEAN) True |
| AspErrorsToNTLog | (BOOLEAN) False |
| AspProcessorThreadMax | (INTEGER) 25 |
| AspTrackThreadingModel | (BOOLEAN) False |
| AspRequestQueueMax | (INTEGER) 3000 |
| AspEnableApplicationRestart | (BOOLEAN) True |
| AspQueueConnectionTestTime | (INTEGER) 3 |
| AspSessionMax | (INTEGER) 4294967295 |
| AppAllowDebugging | (BOOLEAN) False |
| AppAllowClientDebug | (BOOLEAN) False |
| PasswordChangeFlags | (INTEGER) 6 |
| AuthChangeUnsecure | (BOOLEAN) False |
| AuthChangeDisable | (BOOLEAN) True |
| AuthAdvNotifyDisable | (BOOLEAN) True |
| DirBrowseFlags | (INTEGER) 1073741886 |
| EnableDirBrowsing | (BOOLEAN) False |
| DirBrowseShowDate | (BOOLEAN) True |
| DirBrowseShowTime | (BOOLEAN) True |
| DirBrowseShowSize | (BOOLEAN) True |
| DirBrowseShowExtension | (BOOLEAN) True |
| DirBrowseShowLongDate | (BOOLEAN) True |
| EnableDefaultDoc | (BOOLEAN) True |
| AuthFlags | (INTEGER) 1 |
| AuthBasic | (BOOLEAN) False |
| AuthAnonymous | (BOOLEAN) True |
| AuthNTLM | (BOOLEAN) False |

| Property | Value |
|---|---|
| AuthMD5 | (BOOLEAN) False |
| AuthPassport | (BOOLEAN) False |
| InProcessIsapiApps | (LIST) (6 Items)<br>"%windir%\system32\inetsrv\httpext.dll"<br>"%windir%\system32\inetsrv\httpodbc.dll"<br>"%windir%\system32\inetsrv\ssinc.dll"<br>"%windir%\system32\msw3prt.dll"<br>"%windir%\Microsoft.NET\Framework\v2.0.50727\aspnet_isapi.dll" |
| LogOdbcDataSource | (STRING) "HTTPLOG"> |
| LogOdbcTableName | (STRING) "InternetLog" |
| LogOdbcUserName | (STRING) "InternetAdmin" |
| WAMUserName | (STRING) "IWAM_<machinename>"> |
| AuthChangeURL | (STRING) "/iisadmpwd/achg.asp" |
| AuthExpiredURL | (STRING) "/iisadmpwd/aexp.asp" |
| AuthNotifyPwdExpURL | (STRING) "/iisadmpwd/anot.asp" |
| AuthExpiredUnsecureURL | (STRING) "/iisadmpwd/aexp3.asp" |
| AuthNotifyPwdExpUnsecureURL | (STRING) "/iisadmpwd/anot3.asp" |
| AppPoolId | (STRING) "DefaultAppPool" |
| IIs5IsolationModeEnabled | (BOOLEAN) False |
| MaxGlobalBandwidth | (INTEGER) 4294967295 |
| MinFileBytesPerSec | (INTEGER) 240 |
| LogInUTF8 | (BOOLEAN) False |
| AspAppServiceFlags | (INTEGER) 0 |
| AspEnableTracker | (BOOLEAN) False |
| AspEnableSxs | (BOOLEAN) False |
| AspUsePartition | (BOOLEAN) False |

| Property | Value |
|---|---|
| AspKeepSessionIDSecure | (INTEGER) 0 |
| AspExecuteInMTA | (INTEGER) 0 |
| CentralBinaryLoggingEnabled | (BOOLEAN) False |
| AspRunOnEndAnonymously | (BOOLEAN) True |
| AspBufferingLimit | (INTEGER) 4194304 |
| AspCalcLineNumber | (BOOLEAN) True |
| ApplicationDependencies | (LIST) (6 Items)<br>"Active Server Pages;ASP"<br>"Internet Data Connector;HTTPODBC"<br>"Server Side Includes;SSINC"<br>"WebDAV;WEBDAV"<br>"ASP.NET v1.1.4322;ASP.NET v1.1.4322" |
| WebSvcExtRestrictionList | (LIST) (8 Items)<br>"0,*.dll"<br>"0,*.exe"><br>"0,<windir>\system32\inetsrv\asp.dll,0,ASP,Active Server Pages"><br>"0,<windir>\system32\inetsrv\httpodbc.dll,0,HTTPODBC,Internet Data Connector"<br>"0,<windir>\system32\inetsrv\ssinc.dll,0,SSINC,Server Side Includes"<br>"0,<windir>\system32\inetsrv\httpext.dll,0,WEBDAV,WebDAV"><br>"1,<windir>\Microsoft.NET\Framework\v2.0.50727\aspnet_isapi.dll,0,ASP.NET v2.0.50727,ASP.NET v2.0.50727" |
| AspMaxRequestEntityAllowed | (INTEGER) 204800 |
| [/w3svc/1] | **n/a** |
| [/w3svc/AppPools] | **n/a** |
| [/w3svc/Filters] | **n/a** |

| Property | Value |
|---|---|
| [/w3svc/Info] | **n/a** |

# Global Properties of the WWW Web site

These properties can be retrieved with the following adsutil command:

**adsutil.vbs enum W3SVC/***WebSiteID*

The properties listed below comprise a partial list.

| Property | Value |
|---|---|
| KeyType | (STRING) "IIsWebServer" |
| ServerState | (INTEGER) 2 |
| ServerComment | (STRING) "Default Website" |
| ServerSize | (INTEGER) 1 |
| ServerBindings | (LIST) (1 Items) ":80:" (or 8530) |
| SecureBindings | (LIST) (1 Items) ":443:" (or 8531) |
| ConnectionTimeout | (INTEGER) 180 |
| DefaultDoc | (STRING) "Default.htm,Default.asp,index.htm,iisstart.htm" |
| AspBufferingOn | (BOOLEAN) False |
| LogPluginClsid | (STRING) "{FF160663-DE82-11CF-BC0A-00AA006111E0}" |
| Win32Error | (INTEGER) 0 |
| AppPoolId | (STRING) "DefaultAppPool" |

# Properties of the API Remoting Web service

| Property | Value |
|---|---|
| KeyType | (STRING) "IIsWebVirtualDir" |
| AppRoot | (STRING) "/LM/W3SVC/*WebSiteID*/ROOT/ApiRemoting30" |
| AppFriendlyName | (STRING) "ApiRemoting30" |
| AppIsolated | (INTEGER) 2 |
| Path | (STRING) "<WSUSInstallDir>\WebServices\ApiRemoting30" |
| AccessFlags | (INTEGER) 513 |
| AccessExecute | (BOOLEAN) False |
| AccessSource | (BOOLEAN) False |
| AccessRead | (BOOLEAN) True |
| AccessWrite | (BOOLEAN) False |
| AccessScript | (BOOLEAN) True |
| AccessNoRemoteExecute | (BOOLEAN) False |
| AccessNoRemoteRead | (BOOLEAN) False |
| AccessNoRemoteWrite | (BOOLEAN) False |
| AccessNoRemoteScript | (BOOLEAN) False |
| AccessNoPhysicalDir | (BOOLEAN) False |
| AspScriptErrorSentToBrowser | (BOOLEAN) False |
| AspEnableParentPaths | (BOOLEAN) False |
| AuthFlags | (INTEGER) 21 |
| AuthBasic | (BOOLEAN) False |
| AuthAnonymous | (BOOLEAN) True |
| AuthNTLM | (BOOLEAN) True |
| AuthMD5 | (BOOLEAN) True |
| AuthPassport | (BOOLEAN) False |
| AppPoolId | (STRING) "WsusPool" |

# Properties of the Client Web service

| Property | Value |
|---|---|
| KeyType | (STRING) "IIsWebVirtualDir" |
| AppRoot | (STRING) "/LM/W3SVC/*WebSiteID*/ROOT/ClientWebService" |
| AppFriendlyName | (STRING) "ClientWebService" |
| AppIsolated | (INTEGER) 2 |
| Path | (STRING) "<WSUSInstallDir>\WebServices\ClientWebService" |
| AccessFlags | (INTEGER) 513 |
| AccessExecute | (BOOLEAN) False |
| AccessSource | (BOOLEAN) False |
| AccessRead | (BOOLEAN) True |
| AccessWrite | (BOOLEAN) False |
| AccessScript | (BOOLEAN) True |
| AccessNoRemoteExecute | (BOOLEAN) False |
| AccessNoRemoteRead | (BOOLEAN) False |
| AccessNoRemoteWrite | (BOOLEAN) False |
| AccessNoRemoteScript | (BOOLEAN) False |
| AccessNoPhysicalDir | (BOOLEAN) False |
| AspScriptErrorSentToBrowser | (BOOLEAN) False |
| AspEnableParentPaths | (BOOLEAN) False |
| AuthFlags | (INTEGER) 1 |
| AuthBasic | (BOOLEAN) False |
| AuthAnonymous | (BOOLEAN) True |
| AuthNTLM | (BOOLEAN) False |

| Property | Value |
|---|---|
| AuthMD5 | (BOOLEAN) False |
| AuthPassport | (BOOLEAN) False |
| AppPoolId | (STRING) "WsusPool" |

# Properties of the Downstream Server Authentication Web service

| Property | Value |
|---|---|
| KeyType | (STRING) "IIsWebVirtualDir" |
| AppRoot | (STRING) "/LM/W3SVC/*WebSiteID*/ROOT/DssAuthWebService" |
| AppFriendlyName | (STRING) " DssAuthWebService " |
| AppIsolated | (INTEGER) 2 |
| Path | (STRING) "<WSUSInstallDir>\WebServices\DssAuthWebService" |
| AccessFlags | (INTEGER) 513 |
| AccessExecute | (BOOLEAN) False |
| AccessSource | (BOOLEAN) False |
| AccessRead | (BOOLEAN) True |
| AccessWrite | (BOOLEAN) False |
| AccessScript | (BOOLEAN) True |
| AccessNoRemoteExecute | (BOOLEAN) False |
| AccessNoRemoteRead | (BOOLEAN) False |
| AccessNoRemoteWrite | (BOOLEAN) False |
| AccessNoRemoteScript | (BOOLEAN) False |
| AccessNoPhysicalDir | (BOOLEAN) False |

| Property | Value |
|---|---|
| AspScriptErrorSentToBrowser | (BOOLEAN) False |
| AspEnableParentPaths | (BOOLEAN) False |
| AuthFlags | (INTEGER) 1 |
| AuthBasic | (BOOLEAN) False |
| AuthAnonymous | (BOOLEAN) True |
| AuthNTLM | (BOOLEAN) False |
| AuthMD5 | (BOOLEAN) False |
| AuthPassport | (BOOLEAN) False |
| AppPoolId | (STRING) "WsusPool" |

# Properties of the Inventory Collection Web service

| Property | Value |
|---|---|
| KeyType | (STRING) "IIsWebVirtualDir" |
| AppRoot | (STRING) "/LM/W3SVC/*WebSiteID*/ROOT/Inventory" |
| AppFriendlyName | (STRING) "Inventory" |
| AppIsolated | (INTEGER) 2 |
| Path | (STRING) "<WSUSInstallDir>\WebServices\Inventory" |
| AccessFlags | (INTEGER) 513 |
| AccessExecute | (BOOLEAN) False |
| AccessSource | (BOOLEAN) False |
| AccessRead | (BOOLEAN) True |
| AccessWrite | (BOOLEAN) False |

| Property | Value |
|---|---|
| AccessScript | (BOOLEAN) True |
| AccessNoRemoteExecute | (BOOLEAN) False |
| AccessNoRemoteRead | (BOOLEAN) False |
| AccessNoRemoteWrite | (BOOLEAN) False |
| AccessNoRemoteScript | (BOOLEAN) False |
| AccessNoPhysicalDir | (BOOLEAN) False |
| AspScriptErrorSentToBrowser | (BOOLEAN) False |
| AspEnableParentPaths | (BOOLEAN) False |
| AuthFlags | (INTEGER) 1 |
| AuthBasic | (BOOLEAN) False |
| AuthAnonymous | (BOOLEAN) True |
| AuthNTLM | (BOOLEAN) False |
| AuthMD5 | (BOOLEAN) False |
| AuthPassport | (BOOLEAN) False |
| AppPoolId | (STRING) "WsusPool" |

# Checking the properties of the Reporting Web service

| Property | Value |
|---|---|
| KeyType | (STRING) "IIsWebVirtualDir" |
| AppRoot | (STRING) "/LM/W3SVC/*WebSiteID*/ROOT/ReportingWebService" |
| AppFriendlyName | (STRING) " ReportingWebService " |
| AppIsolated | (INTEGER) 2 |

| Property | Value |
|---|---|
| Path | (STRING) "<WSUSInstallDir>\WebServices\ReportingWebService" |
| AccessFlags | (INTEGER) 513 |
| AccessExecute | (BOOLEAN) False |
| AccessSource | (BOOLEAN) False |
| AccessRead | (BOOLEAN) True |
| AccessWrite | (BOOLEAN) False |
| AccessScript | (BOOLEAN) True |
| AccessNoRemoteExecute | (BOOLEAN) False |
| AccessNoRemoteRead | (BOOLEAN) False |
| AccessNoRemoteWrite | (BOOLEAN) False |
| AccessNoRemoteScript | (BOOLEAN) False |
| AccessNoPhysicalDir | (BOOLEAN) False |
| AspScriptErrorSentToBrowser | (BOOLEAN) False |
| AspEnableParentPaths | (BOOLEAN) False |
| AuthFlags | (INTEGER) 1 |
| AuthBasic | (BOOLEAN) False |
| AuthAnonymous | (BOOLEAN) True |
| AuthNTLM | (BOOLEAN) False |
| AuthMD5 | (BOOLEAN) False |
| AuthPassport | (BOOLEAN) False |
| AppPoolId | (STRING) "WsusPool" |

## Properties of the Selfupdate Web service

| Property | Value |
|---|---|
| KeyType | (STRING) "IIsWebVirtualDir" |
| Path | (STRING) "<WSUSInstallDir>\WebServices\ServerSyncWebService" |
| AccessFlags | (INTEGER) 513 |
| AccessExecute | (BOOLEAN) False |
| AccessSource | (BOOLEAN) False |
| AccessRead | (BOOLEAN) True |
| AccessWrite | (BOOLEAN) False |
| AccessScript | (BOOLEAN) True |
| AccessNoRemoteExecute | (BOOLEAN) False |
| AccessNoRemoteRead | (BOOLEAN) False |
| AccessNoRemoteWrite | (BOOLEAN) False |
| AccessNoRemoteScript | (BOOLEAN) False |
| AccessNoPhysicalDir | (BOOLEAN) False |

# Properties of the Server Synchronization Web service

| Property | Value |
|---|---|
| KeyType | (STRING) "IIsWebVirtualDir" |
| AppRoot | (STRING) "/LM/W3SVC/*WebSiteID*/ROOT/ServerSyncWebService" |
| AppFriendlyName | (STRING) " ServerSyncWebService " |
| AppIsolated | (INTEGER) 2 |
| Path | (STRING) "<WSUSInstallDir>\WebServices\ServerSyncWebService" |
| AccessFlags | (INTEGER) 513 |

| Property | Value |
|---|---|
| AccessExecute | (BOOLEAN) False |
| AccessSource | (BOOLEAN) False |
| AccessRead | (BOOLEAN) True |
| AccessWrite | (BOOLEAN) False |
| AccessScript | (BOOLEAN) True |
| AccessNoRemoteExecute | (BOOLEAN) False |
| AccessNoRemoteRead | (BOOLEAN) False |
| AccessNoRemoteWrite | (BOOLEAN) False |
| AccessNoRemoteScript | (BOOLEAN) False |
| AccessNoPhysicalDir | (BOOLEAN) False |
| AspScriptErrorSentToBrowser | (BOOLEAN) False |
| AspEnableParentPaths | (BOOLEAN) False |
| AuthFlags | (INTEGER) 1 |
| AuthBasic | (BOOLEAN) False |
| AuthAnonymous | (BOOLEAN) True |
| AuthNTLM | (BOOLEAN) False |
| AuthMD5 | (BOOLEAN) False |
| AuthPassport | (BOOLEAN) False |
| AppPoolId | (STRING) "WsusPool" |

# Properties of the Simple Authorization Web service

| Property | Value |
|---|---|
| KeyType | (STRING) "IIsWebVirtualDir" |

| Property | Value |
|---|---|
| AppRoot | (STRING) "/LM/W3SVC/*WebSiteID*/ROOT/SimpleAuthWebService" |
| AppFriendlyName | (STRING) "SimpleAuthWebService" |
| AppIsolated | (INTEGER) 2 |
| Path | (STRING) "<WSUSInstallDir>\WebServices\SimpleAuthWebService" |
| AccessFlags | (INTEGER) 513 |
| AccessExecute | (BOOLEAN) False |
| AccessSource | (BOOLEAN) False |
| AccessRead | (BOOLEAN) True |
| AccessWrite | (BOOLEAN) False |
| AccessScript | (BOOLEAN) True |
| AccessNoRemoteExecute | (BOOLEAN) False |
| AccessNoRemoteRead | (BOOLEAN) False |
| AccessNoRemoteWrite | (BOOLEAN) False |
| AccessNoRemoteScript | (BOOLEAN) False |
| AccessNoPhysicalDir | (BOOLEAN) False |
| AspScriptErrorSentToBrowser | (BOOLEAN) False |
| AspEnableParentPaths | (BOOLEAN) False |
| AuthFlags | (INTEGER) 1 |
| AuthBasic | (BOOLEAN) False |
| AuthAnonymous | (BOOLEAN) True |
| AuthNTLM | (BOOLEAN) False |
| AuthMD5 | (BOOLEAN) False |
| AuthPassport | (BOOLEAN) False |
| AppPoolId | (STRING) "WsusPool" |

# Appendix D: Permissions on WSUS Directories and Registry Keys

Troubleshooting Web services often involves checking permissions on related directories and registry keys. The following sections will explain in detail how to check permissions on WSUS Web services directories and registry keys.

## The cacls system command

The **cacls** system command displays or modifies file or directory access control lists (ACLs). The output of this command specifies the level of access (f=full control, w=write, r=read, n=none) and whether or not the access is inherited by subdirectories (OI=this folder and files, CI=this folder and subfolders, IO=does not apply). See the cacls command reference (http://go.microsoft.com/fwlink/?LinkId=81084) for more information.

The WSUS installation creates several Web service directories.

- *WSUSInstallDir*\WebServices\apiremoting30 (where *WSUSInstallDir* is the directory where WSUS has been installed)
- *WSUSInstallDir*\WebServices\clientwebservice
- *WSUSInstallDir*\WebServices\dssauthwebservice
- *WSUSInstallDir*\WebServices\reportingwebservice
- *WSUSInstallDir*\WebServices\serversyncwebservice
- *WSUSInstallDir*\WebServices\simpleauthwebservice
- *WSUSInstallDir*\Inventory
- *WSUSInstallDir*\Selfupdate

All of the directories above (except for the self-update directory) should have the following ACLs:

- NT AUTHORITY\NETWORK SERVICE:(OI)(CI)R
- BUILTIN\Users:(OI)(CI)R
- NT AUTHORITY\Authenticated Users:(OI)(CI)R
- BUILTIN\Administrators:(OI)(CI)F
- NT AUTHORITY\SYSTEM:(OI)(CI)F
- The self-update directory should have the following ACLs:

- BUILTIN\Users:(OI)(CI)R
- BUILTIN\Administrators:(OI)(CI)F
- NT AUTHORITY\SYSTEM:(OI)(CI)F

### Permissions on WSUS registry keys

The following permissions are set for the registry during WSUS setup.

- The **Users** and **WSUS Reporters** group must have Read access to the **\HKLM\Software\Microsoft\Update Services\Server** registry key.
- The following accounts must have Full Control permissions to the **\HKLM\Software\Microsoft\Update Services\Server\Setup** registry key:
  - **Network Service**
  - **WSUS Administrators**
  - **Administrators**
  - **System**

# Appendix E: Configuring BITS 2.0 and 3.0 for Download Performance

BITS (Background Intelligent Transfer Service) is the service that Windows Update and Microsoft Update use for downloads. BITS 2.0 is available for download on Windows XP and Windows Server 2003 operating systems, and BITS 3.0 is part of the Windows Vista and Windows Server "Longhorn" operating systems. You can optimize the performance of downloads by configuring BITS through Group Policy. BITS 3.0 offers a number of configurable features that do not exist in earlier versions of BITS.

For more information about BITS, see Background Intelligent Transfer Service (http://go.microsoft.com/fwlink/?LinkId=79389).

## Throttling

Versions of BITs use the computer's network card to measure network traffic. BITS 3.0 can also use the Internet gateway device to monitor traffic if the computer is correctly configured; see Background Intelligent Transfer Service (http://go.microsoft.com/fwlink/?LinkId=79389) for details. However, in some situations

the network card in itself does not give an accurate measurement of the actual state of network traffic. For example, if a computer has a fast network card but a slow network connection (such as a dial-up connection), BITS will give an overly optimistic measurement. It is possible to use Group Policy (in both BITS 2.0 and 3.0) to throttle or limit the network bandwidth that BITS uses for downloads or uploads.

**Note**

BITS bandwidth limitations are system wide, not application specific. You cannot use this setting to limit only WSUS download bandwidth, because the BITS settings will affect BITS in any application.

**To set BITS bandwidth limitations**

1. Start the Group Policy Object Editor (click **Start**, click **Run**, and then type **gpedit.msc**).
2. Expand **Computer Configuration**, then **Administrative Templates**, then **Network**, then **Background Intelligent Transfer Service**.
3. Open the **Maximum network bandwidth that BITS uses** (BITS 2.0) or **Maximum network bandwidth for BITS background transfers** (BITS 3.0) setting.
4. Set the transfer rate in kilobits per second that you want BITS to use (the default is 10).
5. Set the times at which you want to limit the bandwidth (the default is 8:00 A.M. to 5:00 P.M.).
6. Set the limitations to be used outside of the designated time (the default is **Use all available unused bandwidth**, but you may select another limitation).
7. Click **OK**.

**Note**

You must be an administrator to perform this procedure.

# Peer caching

Peer caching is a new feature of BITS 3.0 that allows peers (computers within the same subnet of a network that have the peer caching feature enabled) to share files. If peer caching is enabled on a computer, the Automatic Update agent instructs BITS to make downloaded files available to that computer's peers as well.

When the files have been downloaded, BITS caches them. When another (peer caching-enabled) computer tries to download the same update, BITS on that computer sends a multicast request to all of that computer's peers. If one or more of the peers responds to the request, BITS will download the file from the first computer to respond. If the download from the peer fails or take too long, BITS continues the download from the WSUS server or Microsoft Update.

This feature of BITS can optimize the bandwidth used by WSUS in several ways.

1. Peer caching decreases the amount of data transferred from the WSUS server to its clients, because computers in the same subnet will usually download the updates from each other.
2. Peer caching decreases the amount of data transferred across the WAN when some or all of the clients of a WSUS server are located in different locations.
3. Peer caching decreases the amount of data transferred across the Internet if WSUS clients in the same subnet are configured to download updates from Microsoft Update.

**Note**

BITS peer caching requires computers to be running Windows Vista or Windows Server "Longhorn", and to be part of an Active Directory Domain.

For more information about peer caching and peer servers, see Peer Caching (http://go.microsoft.com/fwlink/?LinkId=79432).

**To enable peer caching (on Windows Vista)**

1. Start the Group Policy Object Editor (click **Start**, click **Run**, and then type **gpedit.msc**).
2. Expand **Computer Configuration**, then **Administrative Templates**, then **Network**, then **Background Intelligent Transfer Service**.
3. Enable the **Allow BITS Peercaching** setting.
4. Enable the **Maximum network bandwidth used for Peercaching** setting, and set the maximum bandwidth in bits per second (the default is 104857), then click **OK**.
5. Enable the **Limit the BITS Peercache size** setting, and set the percentage of disk space to be used for the peer cache (the default is 5 percent), and then click **OK**.
6. Enable the **Limit age of items in the BITs Peercache** setting, and set the

number of days (the default is 90), and then click **OK**.

**Note**

You must be an administrator to perform this procedure.

# Appendix F: Configuring IIS for Download Performance

You can limit the bandwidth for all Web sites or a specific Web site, such as the WSUS Web site, using IIS Manager.

## Limiting bandwidth on all Web sites

**To limit bandwidth on all Web sites (on Windows Server 2003)**

1. Open IIS Manager (click **Start**, click **Administrative Tools**, and then click **Internet Information (IIS) Manager**).
2. Navigate to the **Web Sites** node under the local computer, right-click the node, and then click **Properties**.
3. Select the **Performance** tab.
4. Under **Bandwidth throttling**, select **Limit the total network bandwidth available for all Web sites on this server**, and then specify the maximum bandwidth in kilobytes per second (the default is 1024). You cannot specify a bandwidth lower than 1024 kilobytes per second.
5. Click **OK**.

**Note**

You must be logged on as an administrator or have run IIS as an administrator to perform this procedure.

## Limiting bandwidth on a specific Web site

**To limit bandwidth on a specific Web site (on Windows Server 2003)**

1. Open IIS Manager (click **Start**, click **Administrative Tools**, and then click

**Internet Information (IIS) Manager**).

2. Navigate to the **Web Sites** node under the local computer, select the specific Web site, right-click the node, and then click **Properties**.
3. Select the **Performance** tab.
4. Under **Bandwidth throttling**, select **Limit the total network bandwidth available for all Web sites on this server**, and then specify the maximum bandwidth in kilobytes per second (the default is 1024). You cannot specify a bandwidth lower than 1024 kilobytes per second.
5. Click **OK**.

**Note**

You must be logged on as an administrator or have run IIS as an administrator to perform this procedure.

# Appendix G: Windows Update Agent Result Codes

The Windows Update Agent uses the following set of  result codes.

## Windows Update Agent result codes

The tables in this section show the result code (hexadecimal value), the corresponding string, and the description.

The following table shows WUA success codes.

| Result Code | Result String | Description |
|---|---|---|
| 0x240001 | WU_S_SERVICE_STOP | Windows Update Agent was stopped successfully. |
| 0x240002 | WU_S_SELFUPDATE | Windows Update Agent updated itself. |

| Result Code | Result String | Description |
|---|---|---|
| 0x240003 | WU_S_UPDATE_ERROR | Operation completed successfully but there were errors applying the updates.. |
| 0x240004 | WU_S_MARKED_FOR_DISCONNECT | A callback was marked to be disconnected later because the request to disconnect the operation came while a callback was executing. |
| 0x240005 | WU_S_REBOOT_REQUIRED | The system must be restarted to complete installation of the update. |
| 0x240006 | WU_S_ALREADY_INSTALLED | The update to be installed is already installed on the system. |
| 0x240007 | WU_S_ALREADY_UNINSTALLED | The update to be removed is not installed on the system. |
| 0x240008 | WU_S_ALREADY_DOWNLOADED | The update to be downloaded has already been downloaded. |

The following table shows WUA error codes.

| Result Code | Result String | Description |
|---|---|---|
| 0x80240001 | WU_E_NO_SERVICE | Windows Update Agent was unable the service. |

| Result Code | Result String | Description |
|---|---|---|
| 0x80240002 | WU_E_MAX_CAPACITY_REACHED | The maximum capacity of the servic exceeded. |
| 0x80240003 | WU_E_UNKNOWN_ID | An ID cannot be found. |
| 0x80240004 | WU_E_NOT_INITIALIZED | The object could not be initialized. |
| 0x80240005 | WU_E_RANGEOVERLAP | The update handler requested a byt overlapping a previously requested |
| 0x80240006 | WU_E_TOOMANYRANGES | The requested number of byte rang the maximum number (2^31 - 1). |
| 0x80240007 | WU_E_INVALIDINDEX | The index to a collection was invalid |
| 0x80240008 | WU_E_ITEMNOTFOUND | The key for the item queried could n found. |
| 0x80240009 | WU_E_OPERATIONINPROGRESS | Another conflicting operation was in Some operations such as installatio be performed twice simultaneously. |
| 0x8024000A | WU_E_COULDNOTCANCEL | Cancellation of the operation was no |
| 0x8024000B | WU_E_CALL_CANCELLED | Operation was cancelled. |
| 0x8024000C | WU_E_NOOP | No operation was required. |
| 0x8024000D | WU_E_XML_MISSINGDATA | Windows Update Agent could not fi information in the update's XML dat |
| 0x8024000E | WU_E_XML_INVALID | Windows Update Agent found invali information in the update's XML dat |
| 0x8024000F | WU_E_CYCLE_DETECTED | Circular update relationships were d the metadata. |
| 0x80240010 | WU_E_TOO_DEEP_RELATION | Update relationships too deep to ev were evaluated. |
| 0x80240011 | WU_E_INVALID_RELATIONSHIP | An invalid update relationship was d |
| 0x80240012 | WU_E_REG_VALUE_INVALID | An invalid registry value was read. |
| 0x80240013 | WU_E_DUPLICATE_ITEM | Operation tried to add a duplicate ite |

| Result Code | Result String | Description |
|---|---|---|
| 0x80240016 | WU_E_INSTALL_NOT_ALLOWED | Operation tried to install while anoth installation was in progress or the sy pending a mandatory restart. |
| 0x80240017 | WU_E_NOT_APPLICABLE | Operation was not performed becau are no applicable updates. |
| 0x80240018 | WU_E_NO_USERTOKEN | Operation failed because a required token is missing. |
| 0x80240019 | WU_E_EXCLUSIVE_INSTALL_CONFLICT | An exclusive update cannot be insta other updates at the same time. |
| 0x8024001A | WU_E_POLICY_NOT_SET | A policy value was not set. |
| 0x8024001B | WU_E_SELFUPDATE_IN_PROGRESS | The operation could not be performe the Windows Update Agent is self-u |
| 0x8024001D | WU_E_INVALID_UPDATE | An update contains invalid metadata |
| 0x8024001E | WU_E_SERVICE_STOP | Operation did not complete because service or system was being shut do |
| 0x8024001F | WU_E_NO_CONNECTION | Operation did not complete because network connection was unavailable |
| 0x80240020 | WU_E_NO_INTERACTIVE_USER | Operation did not complete because no logged-on interactive user. |
| 0x80240021 | WU_E_TIME_OUT | Operation did not complete because out. |
| 0x80240022 | WU_E_ALL_UPDATES_FAILED | Operation failed for all the updates. |
| 0x80240023 | WU_E_EULAS_DECLINED | The license terms for all updates we declined. |
| 0x80240024 | WU_E_NO_UPDATE | There are no updates. |
| 0x80240025 | WU_E_USER_ACCESS_DISABLED | Group Policy settings prevented acc Windows Update. |
| 0x80240026 | WU_E_INVALID_UPDATE_TYPE | The type of update is invalid. |
| 0x80240027 | WU_E_URL_TOO_LONG | The URL exceeded the maximum le |

| Result Code | Result String | Description |
|---|---|---|
| 0x80240028 | WU_E_UNINSTALL_NOT_ALLOWED | The update could not be uninstalled the request did not originate from a server. |
| 0x80240029 | WU_E_INVALID_PRODUCT_LICENSE | Search may have missed some upd before there is an unlicensed applic the system. |
| 0x8024002A | WU_E_MISSING_HANDLER | A component required to detect app updates was missing. |
| 0x8024002B | WU_E_LEGACYSERVER | An operation did not complete beca requires a newer version of server. |
| 0x8024002C | WU_E_BIN_SOURCE_ABSENT | A delta-compressed update could n installed because it required the sou |
| 0x8024002D | WU_E_SOURCE_ABSENT | A full-file update could not be install because it required the source. |
| 0x8024002E | WU_E_WU_DISABLED | Access to an unmanaged server is n allowed. |
| 0x8024002F | WU_E_CALL_CANCELLED_BY_POLICY | Operation did not complete because DisableWindowsUpdateAccess poli |
| 0x80240030 | WU_E_INVALID_PROXY_SERVER | The format of the proxy list was inva |
| 0x80240031 | WU_E_INVALID_FILE | The file is in the wrong format. |
| 0x80240032 | WU_E_INVALID_CRITERIA | The search criteria string was invali |
| 0x80240033 | WU_E_EULA_UNAVAILABLE | License terms could not be downloa |
| 0x80240034 | WU_E_DOWNLOAD_FAILED | Update failed to download. |
| 0x80240035 | WU_E_UPDATE_NOT_PROCESSED | The update was not processed. |
| 0x80240036 | WU_E_INVALID_OPERATION | The object's current state did not all operation. |
| 0x80240037 | WU_E_NOT_SUPPORTED | The functionality for the operation is supported. |
| 0x80240038 | WU_E_WINHTTP_INVALID_FILE | The downloaded file has an unexpe content type. |

| Result Code | Result String | Description |
|---|---|---|
| 0x80240039 | WU_E_TOO_MANY_RESYNC | Agent is asked by server to resync t times. |
| 0x80240040 | WU_E_NO_SERVER_CORE_SUPPORT | WUA API method does not run on S installation. |
| 0x80240041 | WU_E_SYSPREP_IN_PROGRESS | Service is not available while syspre running. |
| 0x80240042 | WU_E_UNKNOWN_SERVICE | The update service is no longer regi AU. |
| 0x80240FFF | WU_E_UNEXPECTED | An operation failed due to reasons r by another error code. |
| 0x80241001 | WU_E_MSI_WRONG_VERSION | Search may have missed some upd because the Windows Installer is les version 3.1. |
| 0x80241002 | WU_E_MSI_NOT_CONFIGURED | Search may have missed some upd because the Windows Installer is no configured. |
| 0x80241003 | WU_E_MSP_DISABLED | Search may have missed some upd because policy has disabled Windo patching. |
| 0x80241004 | WU_E_MSI_WRONG_APP_CONTEXT | An update could not be applied beca application is installed per-user. |
| 0x80241FFF | WU_E_MSP_UNEXPECTED | Search may have missed some upd because there was a failure of the W Installer. |
| 0x80242000 | WU_E_UH_REMOTEUNAVAILABLE | A request for a remote update hand not be completed because no remot is available. |
| 0x80242001 | WU_E_UH_LOCALONLY | A request for a remote update hand not be completed because the hand only. |

| Result Code | Result String | Description |
|---|---|---|
| 0x80242002 | WU_E_UH_UNKNOWNHANDLER | A request for an update handler cou completed because the handler cou recognized. |
| 0x80242003 | WU_E_UH_REMOTEALREADYACTIVE | A remote update handler could not because one already exists. |
| 0x80242004 | WU_E_UH_DOESNOTSUPPORTACTION | A request for the handler to install ( an update could not be completed b update does not support install (uni |
| 0x80242005 | WU_E_UH_WRONGHANDLER | An operation did not complete beca wrong handler was specified. |
| 0x80242006 | WU_E_UH_INVALIDMETADATA | A handler operation could not be co because the update contains invalid |
| 0x80242007 | WU_E_UH_INSTALLERHUNG | An operation could not be complete the installer exceeded the time limit. |
| 0x80242008 | WU_E_UH_OPERATIONCANCELLED | An operation being done by the upd handler was cancelled. |
| 0x80242009 | WU_E_UH_BADHANDLERXML | An operation could not be complete the handler-specific metadata is inv |
| 0x8024200A | WU_E_UH_CANREQUIREINPUT | A request to the handler to install ar could not be completed because the requires user input. |
| 0x8024200B | WU_E_UH_INSTALLERFAILURE | The installer failed to install (uninsta more updates. |
| 0x8024200C | WU_E_UH_FALLBACKTOSELFCONTAINED | The update handler should downloa contained content rather than delta- compressed content for the update. |
| 0x8024200D | WU_E_UH_NEEDANOTHERDOWNLOAD | The update handler did not install th because it needs to be downloaded |
| 0x8024200E | WU_E_UH_NOTIFYFAILURE | The update handler failed to send n of the status of the install (uninstall) |

| Result Code | Result String | Description |
|---|---|---|
| 0x8024200F | WU_E_UH_INCONSISTENT_FILE_NAMES | The file names contained in the upd metadata and in the update packag inconsistent. |
| 0x80242010 | WU_E_UH_FALLBACKERROR | The update handler failed to fall bac self-contained content. |
| 0x80242011 | WU_E_UH_TOOMANYDOWNLOADREQUESTS | The update handler has exceeded t maximum number of download requ |
| 0x80242012 | WU_E_UH_UNEXPECTEDCBSRESPONSE | The update handler has received an unexpected response from CBS. |
| 0x80242013 | WU_E_UH_BADCBSPACKAGEID | The update metadata contains an in package identifier. |
| 0x80242014 | WU_E_UH_POSTREBOOTSTILLPENDING | he post-reboot operation for the upd in progress. |
| 0x80242015 | WU_E_UH_POSTREBOOTRESULTUNKNOWN | The result of the post-reboot operati update could not be determined. |
| 0x80242016 | WU_E_UH_POSTREBOOTUNEXPECTEDSTATE | The state of the update after its pos operation has completed is unexpec |
| 0x80242017 | WU_E_UH_NEW_SERVICING_STACK_REQUIRED | The operating system servicing stac updated before this update is downl installed. |
| 0x80242FFF | WU_E_UH_UNEXPECTED | An update handler error not covered another WU_E_UH_* code. |
| 0x80243001 | WU_E_INSTALLATION_RESULTS_UNKNOWN_VERSION | The results of download and installa not be read from the registry due to unrecognized data format version. |
| 0x80243002 | WU_E_INSTALLATION_RESULTS_INVALID_DATA | The results of download and installa not be read from the registry due to data format. |
| 0x80243003 | WU_E_INSTALLATION_RESULTS_NOT_FOUND | The results of download and installa not available; the operation may hav start. |

| Result Code | Result String | Description |
|---|---|---|
| 0x80243004 | WU_E_TRAYICON_FAILURE | A failure occurred when trying to cre icon in the taskbar notification area. |
| 0x80243FFD | WU_E_NON_UI_MODE | Unable to show UI when in non-UI m client UI modules may not be install |
| 0x80243FFE | WU_E_WUCLTUI_UNSUPPORTED_VERSION | Unsupported version of WU client U functions. |
| 0x80243FFF | WU_E_AUCLIENT_UNEXPECTED | There was a user interface error not by another WU_E_AUCLIENT_* err |
| 0x80244000 | WU_E_PT_SOAPCLIENT_BASE | WU_E_PT_SOAPCLIENT_* error co to the SOAPCLIENT_ERROR enum ATL Server Library. |
| 0x80244001 | WU_E_PT_SOAPCLIENT_INITIALIZE | SOAPCLIENT_INITIALIZE_ERROR initialization of the SOAP client faile because of an MSXML installation fa |
| 0x80244002 | WU_E_PT_SOAPCLIENT_OUTOFMEMORY | SOAPCLIENT_OUTOFMEMORY - client failed because it ran out of me |
| 0x80244003 | WU_E_PT_SOAPCLIENT_GENERATE | SOAPCLIENT_GENERATE_ERRO client failed to generate the request. |
| 0x80244004 | WU_E_PT_SOAPCLIENT_CONNECT | SOAPCLIENT_CONNECT_ERROR client failed to connect to the server |
| 0x80244005 | WU_E_PT_SOAPCLIENT_SEND | SOAPCLIENT_SEND_ERROR - SO failed to send a message for reason WU_E_WINHTTP_* error codes. |
| 0x80244006 | WU_E_PT_SOAPCLIENT_SERVER | SOAPCLIENT_SERVER_ERROR - client failed because there was a se |
| 0x80244007 | WU_E_PT_SOAPCLIENT_SOAPFAULT | SOAPCLIENT_SOAPFAULT - SOA failed because there was a SOAP fa reasons of WU_E_PT_SOAP_* erro |
| 0x80244008 | WU_E_PT_SOAPCLIENT_PARSEFAULT | SOAPCLIENT_PARSEFAULT_ERR SOAP client failed to parse a SOAP |

| Result Code | Result String | Description |
|---|---|---|
| 0x80244009 | WU_E_PT_SOAPCLIENT_READ | SOAPCLIENT_READ_ERROR - SO failed while reading the response fro server. |
| 0x8024400A | WU_E_PT_SOAPCLIENT_PARSE | SOAPCLIENT_PARSE_ERROR - S failed to parse the response from th |
| 0x8024400B | WU_E_PT_SOAP_VERSION | SOAP_E_VERSION_MISMATCH - client found an unrecognizable nam the SOAP envelope. |
| 0x8024400C | WU_E_PT_SOAP_MUST_UNDERSTAND | SOAP_E_MUST_UNDERSTAND - client was unable to understand a h |
| 0x8024400D | WU_E_PT_SOAP_CLIENT | SOAP_E_CLIENT - SOAP client fou message was malformed; fix before |
| 0x8024400E | WU_E_PT_SOAP_SERVER | SOAP_E_SERVER - The SOAP me could not be processed due to a ser resend later. |
| 0x8024400F | WU_E_PT_WMI_ERROR | There was an unspecified Windows Management Instrumentation (WMI) |
| 0x80244010 | WU_E_PT_EXCEEDED_MAX_SERVER_TRIPS | The number of round trips to the ser exceeded the maximum limit. |
| 0x80244011 | WU_E_PT_SUS_SERVER_NOT_SET | WUServer policy value is missing in registry. |
| 0x80244012 | WU_E_PT_DOUBLE_INITIALIZATION | Initialization failed because the obje already initialized. |
| 0x80244013 | WU_E_PT_INVALID_COMPUTER_NAME | The computer name could not be de |
| 0x80244015 | WU_E_PT_REFRESH_CACHE_REQUIRED | The reply from the server indicates t server was changed or the cookie w refresh the state of the internal cach retry. |
| 0x80244016 | WU_E_PT_HTTP_STATUS_BAD_REQUEST | HTTP 400 - the server could not pro request due to invalid syntax. |
| 0x80244017 | WU_E_PT_HTTP_STATUS_DENIED | HTTP 401 - the requested resource user authentication. |

| Result Code | Result String | Description |
|---|---|---|
| 0x80244018 | WU_E_PT_HTTP_STATUS_FORBIDDEN | HTTP 403 - server understood the r declined to fulfill it. |
| 0x80244019 | WU_E_PT_HTTP_STATUS_NOT_FOUND | HTTP 404 - the server cannot find th requested URI (Uniform Resource Id |
| 0x8024401A | WU_E_PT_HTTP_STATUS_BAD_METHOD | HTTP 405 - the HTTP method is not |
| 0x8024401B | WU_E_PT_HTTP_STATUS_PROXY_AUTH_REQ | HTTP 407 - proxy authentication is r |
| 0x8024401C | WU_E_PT_HTTP_STATUS_REQUEST_TIMEOUT | HTTP 408 - the server timed out wa request. |
| 0x8024401D | WU_E_PT_HTTP_STATUS_CONFLICT | HTTP 409 - the request was not com due to a conflict with the current stat resource. |
| 0x8024401E | WU_E_PT_HTTP_STATUS_GONE | HTTP 410 - requested resource is n available at the server. |
| 0x8024401F | WU_E_PT_HTTP_STATUS_SERVER_ERROR | HTTP 500 - an error internal to the s prevented fulfilling the request. |
| 0x80244020 | WU_E_PT_HTTP_STATUS_NOT_SUPPORTED | HTTP 501 - server does not support functionality required to fulfill the req |
| 0x80244021 | WU_E_PT_HTTP_STATUS_BAD_GATEWAY | HTTP 502 - the server, while acting gateway or proxy, received an invali response from the upstream server accessed in attempting to fulfill the r |
| 0x80244022 | WU_E_PT_HTTP_STATUS_SERVICE_UNAVAIL | HTTP 503 - the service is temporari overloaded. |
| 0x80244023 | WU_E_PT_HTTP_STATUS_GATEWAY_TIMEOUT | HTTP 504 - the request was timed o for a gateway. |
| 0x80244024 | WU_E_PT_HTTP_STATUS_VERSION_NOT_SUP | HTTP 505 - the server does not sup HTTP protocol version used for the |
| 0x80244025 | WU_E_PT_FILE_LOCATIONS_CHANGED | Operation failed due to a changed fi refresh internal state and resend. |

| Result Code | Result String | Description |
|---|---|---|
| 0x80244026 | WU_E_PT_REGISTRATION_NOT_SUPPORTED | Operation failed because Windows Agent does not support registration WSUS server. |
| 0x80244027 | WU_E_PT_NO_AUTH_PLUGINS_REQUESTED | The server returned an empty authe information list. |
| 0x80244028 | WU_E_PT_NO_AUTH_COOKIES_CREATED | Windows Update Agent was unable any valid authentication cookies. |
| 0x80244029 | WU_E_PT_INVALID_CONFIG_PROP | A configuration property value was |
| 0x8024402A | WU_E_PT_CONFIG_PROP_MISSING | A configuration property value was |
| 0x8024402B | WU_E_PT_HTTP_STATUS_NOT_MAPPED | The HTTP request could not be com the reason did not correspond to an WU_E_PT_HTTP_* error codes. |
| 0x8024402C | WU_E_PT_WINHTTP_NAME_NOT_RESOLVED | ERROR_WINHTTP_NAME_NOT_F - the proxy server or target server na cannot be resolved. |
| 0x8024402F | WU_E_PT_ECP_SUCCEEDED_WITH_ERRORS | External cab file processing comple some errors. |
| 0x80244030 | WU_E_PT_ECP_INIT_FAILED | The external cab processor initializa not complete. |
| 0x80244031 | WU_E_PT_ECP_INVALID_FILE_FORMAT | The format of a metadata file was in |
| 0x80244032 | WU_E_PT_ECP_INVALID_METADATA | External cab processor found invalid metadata. |
| 0x80244033 | WU_E_PT_ECP_FAILURE_TO_EXTRACT_DIGEST | The file digest could not be extracte external cab file. |
| 0x80244034 | WU_E_PT_ECP_FAILURE_TO_DECOMPRESS_CAB_FILE | An external cab file could not be decompressed. |
| 0x80244035 | WU_E_PT_ECP_FILE_LOCATION_ERROR | External cab processor was unable locations. |
| 0x80244FFF | WU_E_PT_UNEXPECTED | A communication error not covered WU_E_PT_* error code |

| Result Code | Result String | Description |
|---|---|---|
| 0x80245001 | WU_E_REDIRECTOR_LOAD_XML | The redirector XML document could loaded into the DOM class. |
| 0x80245002 | WU_E_REDIRECTOR_S_FALSE | The redirector XML document is mis required information. |
| 0x80245003 | WU_E_REDIRECTOR_ID_SMALLER | The redirector ID in the downloaded cab is less than in the cached cab. |
| 0x8024502D | WU_E_PT_SAME_REDIR_ID | Windows Update Agent failed to dow redirector cabinet file with a new rec value from the server during the rec |
| 0x8024502E | WU_E_PT_NO_MANAGED_RECOVER | A redirector recovery action did not because the server is managed. |
| 0x80245FFF | WU_E_REDIRECTOR_UNEXPECTED | The redirector failed for reasons not by another WU_E_REDIRECTOR_* code. |
| 0x80246001 | WU_E_DM_URLNOTAVAILABLE | A download manager operation cou completed because the requested fi have a URL. |
| 0x80246002 | WU_E_DM_INCORRECTFILEHASH | A download manager operation cou completed because the file digest w recognized. |
| 0x80246003 | WU_E_DM_UNKNOWNALGORITHM | A download manager operation cou completed because the file metadat requested an unrecognized hash alg |
| 0x80246004 | WU_E_DM_NEEDDOWNLOADREQUEST | An operation could not be complete a download request is required from download handler. |
| 0x80246005 | WU_E_DM_NONETWORK | A download manager operation cou completed because the network con was unavailable. |
| 0x80246006 | WU_E_DM_WRONGBITSVERSION | A download manager operation cou completed because the version of B Intelligent Transfer Service (BITS) is incompatible. |

| Result Code | Result String | Description |
|---|---|---|
| 0x80246007 | WU_E_DM_NOTDOWNLOADED | The update has not been downloade |
| 0x80246008 | WU_E_DM_FAILTOCONNECTTOBITS | A download manager operation faile the download manager was unable the Background Intelligent Transfer (BITS). |
| 0x80246009 | WU_E_DM_BITSTRANSFERERROR | A download manager operation faile there was an unspecified Backgrour Intelligent Transfer Service (BITS) tr error. |
| 0x8024600a | WU_E_DM_DOWNLOADLOCATIONCHANGED | A download must be restarted beca location of the source of the downlo changed. |
| 0x8024600B | WU_E_DM_CONTENTCHANGED | A download must be restarted beca update content changed in a new re |
| 0x80246FFF | WU_E_DM_UNEXPECTED | There was a download manager err covered by another WU_E_DM_* er |
| 0x80247001 | WU_E_OL_INVALID_SCANFILE | An operation could not be complete the scan package was invalid. |
| 0x80247002 | WU_E_OL_NEWCLIENT_REQUIRED | An operation could not be complete the scan package requires a greate the Windows Update Agent. |
| 0x80247FFF | WU_E_OL_UNEXPECTED | Search using the scan package faile |
| 0x80248000 | WU_E_DS_SHUTDOWN | An operation failed because Windov Agent is shutting down. |
| 0x80248001 | WU_E_DS_INUSE | An operation failed because the dat was in use. |
| 0x80248002 | WU_E_DS_INVALID | The current and expected states of store do not match. |
| 0x80248003 | WU_E_DS_TABLEMISSING | The data store is missing a table. |
| 0x80248004 | WU_E_DS_TABLEINCORRECT | The data store contains a table with unexpected columns. |

| Result Code | Result String | Description |
|---|---|---|
| 0x80248005 | WU_E_DS_INVALIDTABLENAME | A table could not be opened becaus is not in the data store. |
| 0x80248006 | WU_E_DS_BADVERSION | The current and expected versions store do not match. |
| 0x80248007 | WU_E_DS_NODATA | The information requested is not in store. |
| 0x80248008 | WU_E_DS_MISSINGDATA | The data store is missing required i or has a NULL in a table column tha a non-null value. |
| 0x80248009 | WU_E_DS_MISSINGREF | The data store is missing required i or has a reference to missing licens file, localized property or linked row. |
| 0x8024800A | WU_E_DS_UNKNOWNHANDLER | The update was not processed beca update handler could not be recogn |
| 0x8024800B | WU_E_DS_CANTDELETE | The update was not deleted becaus referenced by one or more services |
| 0x8024800C | WU_E_DS_LOCKTIMEOUTEXPIRED | The data store section could not be within the allotted time. |
| 0x8024800D | WU_E_DS_NOCATEGORIES | The category was not added becaus contains no parent categories and i level category itself. |
| 0x8024800E | WU_E_DS_ROWEXISTS | The row was not added because an row has the same primary key. |
| 0x8024800F | WU_E_DS_STOREFILELOCKED | The data store could not be initialize it was locked by another process. |
| 0x80248010 | WU_E_DS_CANNOTREGISTER | The data store is not allowed to be with COM in the current process. |
| 0x80248011 | WU_E_DS_UNABLETOSTART | Could not create a data store object process. |
| 0x80248013 | WU_E_DS_DUPLICATEUPDATEID | The server sent the same update to with two different revision IDs. |

| Result Code | Result String | Description |
|---|---|---|
| 0x80248014 | WU_E_DS_UNKNOWNSERVICE | An operation did not complete beca service is not in the data store. |
| 0x80248015 | WU_E_DS_SERVICEEXPIRED | An operation did not complete beca registration of the service has expire |
| 0x80248016 | WU_E_DS_DECLINENOTALLOWED | A request to hide an update was de because it is a mandatory update or was deployed with a deadline. |
| 0x80248017 | WU_E_DS_TABLESESSIONMISMATCH | A table was not closed because it is associated with the session. |
| 0x80248018 | WU_E_DS_SESSIONLOCKMISMATCH | A table was not closed because it is associated with the session. |
| 0x80248019 | WU_E_DS_NEEDWINDOWSSERVICE | A request to remove the Windows U service or to unregister it with Auton Updates was declined because it is service and/or Automatic Updates c back to another service. |
| 0x8024801A | WU_E_DS_INVALIDOPERATION | A request was declined because the is not allowed. |
| 0x8024801B | WU_E_DS_SCHEMAMISMATCH | The schema of the current data stor schema of a table in a backup XML do not match. |
| 0x8024801C | WU_E_DS_RESETREQUIRED | The data store requires a session re release the session and retry with a session. |
| 0x8024801D | WU_E_DS_IMPERSONATED | A data store operation did not comp because it was requested with an impersonated identity. |
| 0x80248FFF | WU_E_DS_UNEXPECTED | A data store error not covered by an WU_E_DS_* code. |
| 0x80249001 | WU_E_INVENTORY_PARSEFAILED | Parsing of the rule file failed. |
| 0x80249002 | WU_E_INVENTORY_GET_INVENTORY_TYPE_FAILED | Failed to get the requested inventor the server. |

| Result Code | Result String | Description |
|---|---|---|
| 0x80249003 | WU_E_INVENTORY_RESULT_UPLOAD_FAILED | Failed to upload inventory result to t |
| 0x80249004 | WU_E_INVENTORY_UNEXPECTED | There was an inventory error not co another error code. |
| 0x80249005 | WU_E_INVENTORY_WMI_ERROR | A WMI error occurred when enumer instances for a particular class. |
| 0x8024A000 | WU_E_AU_NOSERVICE | Automatic Updates was unable to s incoming requests. |
| 0x8024A002 | WU_E_AU_NONLEGACYSERVER | The old version of the Automatic Up client has stopped because the WS has been upgraded. |
| 0x8024A003 | WU_E_AU_LEGACYCLIENTDISABLED | The old version of the Automatic Up client was disabled. |
| 0x8024A004 | WU_E_AU_PAUSED | Automatic Updates was unable to p incoming requests because it was p |
| 0x8024A005 | WU_E_AU_NO_REGISTERED_SERVICE | No unmanaged service is registered |
| 0x8024AFFF | WU_E_AU_UNEXPECTED | An Automatic Updates error not cov another WU_E_AU * code. |
| 0x8024C001 | WU_E_DRV_PRUNED | A driver was skipped. |
| 0x8024C002 | WU_E_DRV_NOPROP_OR_LEGACY | A property for the driver could not b may not conform with required spec |
| 0x8024C003 | WU_E_DRV_REG_MISMATCH | The registry type read for the driver match the expected type. |
| 0x8024C004 | WU_E_DRV_NO_METADATA | The driver update is missing metada |
| 0x8024C005 | WU_E_DRV_MISSING_ATTRIBUTE | The driver update is missing a requi attribute. |
| 0x8024C006 | WU_E_DRV_SYNC_FAILED | Driver synchronization failed. |
| 0x8024C007 | WU_E_DRV_NO_PRINTER_CONTENT | Information required for the synchro applicable printers is missing. |
| 0x8024CFFF | WU_E_DRV_UNEXPECTED | A driver error not covered by anothe WU_E_DRV_* code. |

| Result Code | Result String | Description |
|---|---|---|
| 0x8024D001 | WU_E_SETUP_INVALID_INFDATA | Windows Update Agent could not be because an INF file contains invalid information. |
| 0x8024D002 | WU_E_SETUP_INVALID_IDENTDATA | Windows Update Agent could not be because the wuident.cab file contain information. |
| 0x8024D003 | WU_E_SETUP_ALREADY_INITIALIZED | Windows Update Agent could not be because of an internal error that cau initialization to be performed twice. |
| 0x8024D004 | WU_E_SETUP_NOT_INITIALIZED | Windows Update Agent could not be because setup initialization never co successfully. |
| 0x8024D005 | WU_E_SETUP_SOURCE_VERSION_MISMATCH | Windows Update Agent could not be because the versions specified in th not match the actual source file vers |
| 0x8024D006 | WU_E_SETUP_TARGET_VERSION_GREATER | Windows Update Agent could not be because a WUA file on the target sy newer than the corresponding sourc |
| 0x8024D007 | WU_E_SETUP_REGISTRATION_FAILED | Windows Update Agent could not be because regsvr32.exe returned an e |
| 0x8024D008 | WU_E_SELFUPDATE_SKIP_ON_FAILURE | An update to the Windows Update A skipped because previous attempts have failed. |
| 0x8024D009 | WU_E_SETUP_SKIP_UPDATE | An update to the Windows Update A skipped due to a directive in the wui file. |
| 0x8024D00A | WU_E_SETUP_UNSUPPORTED_CONFIGURATION | Windows Update Agent could not be because the current system configu not supported. |
| 0x8024D00B | WU_E_SETUP_BLOCKED_CONFIGURATION | Windows Update Agent could not be because the system is configured to update. |

| Result Code | Result String | Description |
|---|---|---|
| 0x8024D00C | WU_E_SETUP_REBOOT_TO_FIX | Windows Update Agent could not be because a restart of the system is re |
| 0x8024D00D | WU_E_SETUP_ALREADYRUNNING | Windows Update Agent setup is alre running. |
| 0x8024D00E | WU_E_SETUP_REBOOTREQUIRED | Windows Update Agent setup packa requires a reboot to complete install |
| 0x8024D00F | WU_E_SETUP_HANDLER_EXEC_FAILURE | Windows Update Agent could not be because the setup handler failed du execution. |
| 0x8024D010 | WU_E_SETUP_INVALID_REGISTRY_DATA | Windows Update Agent could not be because the registry contains invalid information. |
| 0x8024D011 | WU_E_SELFUPDATE_REQUIRED | Windows Update Agent must be upd before search can continue. |
| 0x8024D012 | WU_E_SELFUPDATE_REQUIRED_ADMIN | Windows Update Agent must be upd before search can continue. An adm is required to perform the operation. |
| 0x8024D013 | WU_E_SETUP_WRONG_SERVER_VERSION | Windows Update Agent could not be because the server does not contain information for this version. |
| 0x8024DFFF | WU_E_SETUP_UNEXPECTED | Windows Update Agent could not be because of an error not covered by WU_E_SETUP_* error code. |
| 0x8024E001 | WU_E_EE_UNKNOWN_EXPRESSION | An expression evaluator operation c be completed because an expressio unrecognized. |
| 0x8024E002 | WU_E_EE_INVALID_EXPRESSION | An expression evaluator operation c be completed because an expressio invalid. |
| 0x8024E003 | WU_E_EE_MISSING_METADATA | An expression evaluator operation c be completed because an expressio an incorrect number of metadata no |

| Result Code | Result String | Description |
|---|---|---|
| 0x8024E004 | WU_E_EE_INVALID_VERSION | An expression evaluator operation c be completed because the version c serialized expression data is invalid. |
| 0x8024E005 | WU_E_EE_NOT_INITIALIZED | The expression evaluator could not initialized. |
| 0x8024E006 | WU_E_EE_INVALID_ATTRIBUTEDATA | An expression evaluator operation c be completed because there was ar attribute. |
| 0x8024E007 | WU_E_EE_CLUSTER_ERROR | An expression evaluator operation c be completed because the cluster s computer could not be determined. |
| 0x8024EFFF | WU_E_EE_UNEXPECTED | There was an expression evaluator covered by another WU_E_EE_* er |
| 0x8024F001 | WU_E_REPORTER_EVENTCACHECORRUPT | The event cache file was defective. |
| 0x8024F002 | WU_E_REPORTER_ EVENTNAMESPACEPARSEFAILED | The XML in the event namespace d could not be parsed. |
| 0x8024F003 | WU_E_INVALID_EVENT | The XML in the event namespace d could not be parsed. |
| 0x8024F004 | WU_E_SERVER_BUSY | The server rejected an event becau server was too busy. |
| 0x8024FFFF | WU_E_REPORTER_UNEXPECTED | There was a reporter error not cove another error code. |

# Appendix H: The wuauclt Utility

The wuauclt utility allows you some control over the functioning of the Windows Update Agent. It is updated as part of Windows Update.

## Command line switches for wuauclt

The following are the command line for wuauclt.

| Option | Description |
|---|---|
| /a /ResetAuthorization | Initiates an asynchronous background search for applicable updates. If Automatic Updates is disabled, this option has no effect. |
| /r /ReportNow | Sends all queued reporting events to the server asynchronously. |
| /? /h /help | Shows this help information. |

# Appendix I: Database Maintenance

In order to keep your WSUS server functioning correctly, you should have a maintenance plan that includes re-indexing the database on a regular basis, preferably at least once a month.

The WsusDBMaintenance script (http://go.microsoft.com/fwlink/?LinkId=87027) allows you to re-index any version of the SUSDB database, either SQL Server 2005 or Windows Internal Database.

If you are using Windows Internal Database, you will need to use the **sqlcmd** utility, which can be downloaded from Feature Pack for Microsoft SQL Server 2005 (http://go.microsoft.com/fwlink/?LinkId=70728). For more information about the **sqlcmd** utility, see sqlcmd Utility (http://go.microsoft.com/fwlink/?LinkId=81183).

To use this script with Windows Internal Database, you should run the following command:

```
sqlcmd -S np:\\.\pipe\MSSQL$MICROSOFT##SSEE\sql\query –i
<scriptLocation>\WsusDBMaintenance.sql
```

where <*scriptLocation*> is the directory where you have copied the WsusDBMaintenance script.