



# Planning and Deploying Service Pack 1 for Microsoft Office SharePoint Server 2007 in a Multi-server Environment

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**Summary:**

Learn how to plan for and deploy Microsoft® Office SharePoint® Server 2007 Service Pack 1. In this document, we present our most up-to-date capacity planning and performance guidance for planning, operations, and monitoring along with deployment information for SP1, so that you can tune and address system performance as you upgrade to SP1.

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## Introduction

We are excited to release Microsoft® Office SharePoint® Server 2007 Service Pack 1 (SP1). In working with customers to help tune system performance, we have also developed updated guidance for how to best structure your system for performance. In this document, we present our most up-to-date planning and performance guidance with deployment information for SP1, so that you can tune and address system performance as you upgrade to SP1.

## Updated planning guidance to consider before moving to Service Pack 1

Our internal investigations have shown that it is best to plan for capacity from the bottom of the stack to the top—first plan your SQL Server capacity, and then plan your application server and front-end Web server capacity.

Before you purchase hardware, determine your information architecture (logical structure and approximate sizing), reliability, and performance requirements for the environment in which you will run SharePoint Products and Technologies and SQL Server.

Your resource plan is dependent on the scenario you are deploying for. As you plan your deployment, review the planning content here:

- [Planning and architecture for Office SharePoint Server 2007](http://go.microsoft.com/fwlink/?LinkID=105576&clcid=0x409)  
(<http://go.microsoft.com/fwlink/?LinkID=105576&clcid=0x409>)
- [Planning and architecture for Windows SharePoint Services 3.0 technology](http://go.microsoft.com/fwlink/?LinkID=105577&clcid=0x409)  
(<http://go.microsoft.com/fwlink/?LinkID=105577&clcid=0x409>)

## Updated planning recommendations for storage

The following recommendations are excerpted from the paper: [Performance recommendations for storage planning and monitoring](http://go.microsoft.com/fwlink/?LinkID=105890&clcid=0x409)  
(<http://go.microsoft.com/fwlink/?LinkID=105890&clcid=0x409>).

## Information architecture recommendations

Planning your information architecture within the boundaries suggested below can enhance system performance.

## Adapt your information architecture design to the software boundaries of SharePoint Products and Technologies.

For more information about software boundaries, see [Plan for software boundaries](http://go.microsoft.com/fwlink/?LinkID=105578&clcid=0x409)  
(<http://go.microsoft.com/fwlink/?LinkID=105578&clcid=0x409>).

## Limit content database size to enhance manageability

Plan for database sizing that will allow for manageability and performance of your environment.

- In most circumstances, to enhance the performance of SharePoint Products and Technologies, we discourage the use of content databases larger than 100 GB. If your design requires a database larger than 100 GB, follow the guidance below:
  - Use a single site collection for the data.
  - Use a differential backup solution, such as SQL Server or Microsoft System Center Data Protection Manager, rather than the built-in backup and recovery tools.

- Test the server running SQL Server and the I/O subsystem before moving to a solution that depends on a 100 GB content database.
- Whenever possible, we strongly advise that you split content from a site collection that is approaching 100 GB into a new site collection in a separate content database to avoid performance or manageability issues.
- Limit content databases that contain **multiple site collections** to approximately 100 GB.  
**Note:** The limits we recommend apply only to a server running SQL Server hosting SharePoint Products and Technologies, and are not general guidance for SQL Server.

## Allocate storage for versions and the recycle bin

If you plan to use versioning or recycle bins in a site, be aware of the potential impact to the site quota.

- In libraries that have version control enabled, the storage used for previous versions counts towards the site quota. Be aware of this fact and plan accordingly.
- For any site, you can enable one or two Recycle Bin stages. The first stage (user and site Recycle Bins) – counts towards the site quota. The second stage (the Site Collection Recycle Bin) does not count toward the site quota; however the content in the second stage is added to the storage used by the site collection. Remember to plan sufficient additional storage space for the second stage Recycle Bin. Pay close attention to the number of days you are retaining deleted documents in each Recycle Bin stage.

## Use quota templates to manage storage

Use quota templates to manage site collections with similar characteristics. A quota template sets storage limits for site collections, and also provides email alerts when specified storage sizes are reached. Any change made to a quota template will not affect previously created sites, only new ones.

## *Physical topology guidance*

The SQL Server topology, and your network, physical storage, and caching can significantly impact system performance. In planning your hardware, remember that this is the last version of SharePoint Products and Technologies that will run on 32-bit operating systems and databases. **Important:** For customers using the gradual upgrade method: in order to maintain reasonable response times from the server running SQL Server, it may be necessary to increase the SQL Server resources supporting SharePoint Products and Technologies by at least a factor of two.

The following recommendations are based on the best practices we have found for SQL Server databases hosting SharePoint Products and Technologies.

## Start with a dedicated server running SQL Server 2005

- Always put SQL Server on a dedicated server that is not running any other farm roles, unless you are deploying on a single server.
- We highly recommended that you install SQL Server 64-bit version on a 64-bit operating system, unless you have a significant business reason not to.
- For optimal performance, host SharePoint Products and Technologies on SQL Server 2005 with the latest Service Pack (SP2 as of the date of this document), unless you have a significant business reason to use an earlier version.
- Make sure that the SQL Server I/O channels to the disks are not shared by other applications, such as the swap file and IIS logs.

## Consider scaling out in addition to adding resources

It is important to track the three resource components serving a server running SQL Server: CPU, memory, and I/O subsystem. When one or more of the components seem stretched, analyze the appropriate course of action based on the current and projected work load and determine whether to add more resources, or to scale out to a new server running SQL Server. In general, we recommend that you consider scaling out, in addition to adding more resources.

We recommend that you deploy an additional server running SQL Server when you have more than four fully loaded front-end Web servers.

## Follow the SQL Server guidelines when choosing hardware

The following guidelines from the SQL Server team for choosing hardware are particularly important for the optimal performance of SharePoint Products and Technologies.

### Memory

For the purposes of determining the amount of memory required for the computers running SQL Server, first determine whether your planned deployment is small, medium, or large in terms of memory consumption.

Metric	value
Content database size	> 50 GB
Number of content databases	> 20
Number of concurrent requests to SQL Server	200
User base	> 1000
Number of items in regularly accessed list	> 2000
Number of columns in regularly accessed list	> 20

Determine your deployment size:

- If your deployment is on the low end of the values mentioned, the deployment can be considered *small*.
- If your deployment is on the medium range of the values, or above them in only a couple of them, the deployment can be considered *medium*.
- If your deployment is on the upper limits, or above, on most values, your deployment is to be considered *large*.

Use this table a general guidance. It does not come to replace common sense or proper planning.

Other factors that may influence your memory needs include:

- The use of SQL Server mirroring.
- Frequent use of files larger than 15 MB.

Determine your recommended memory:

- For SQL Server, 4 GB is the minimum required memory, 8 GB is recommended for medium size deployments, and 16 GB and above is recommended for large deployments.

### Cache

- On the server running SQL Server, we recommend that the L2 cache per CPU have a minimum of at least 2 MB to improve memory.

## Bus Bandwidth

Larger bus bandwidth is a key to improved reliability and performance. Keep in mind that the disk is not the only user of bus bandwidth, for example, you must also account for network access.

- For medium to large-sized servers, larger bus bandwidth improves on the system's reliability, especially with added multi-pathing software. (Larger bus bandwidth does not give significant increase in reliability for smaller systems.) The bus bandwidth's reliability is improved through the redundant paths in the system and by avoiding single-point-of failure in hardware devices.
- Larger bus bandwidth provides improved performance in systems that frequently use large block transfers and sequential I/O.
- In smaller servers that use mostly sequential I/O, PCI becomes a bottleneck with three disks. For a small server that has about eight disks performing mostly random I/O, PCI is sufficient. However, it is more common for PCI-X to be found on servers ranging from small to very large.
- A larger bus bandwidth is also necessary to support a large number of disks.
- The capacity of bus bandwidth may be limited by the topology of the system. If the system uses direct attached disks, the number of slots limits the bus bandwidth capacity. However, for SAN systems, there is no physical limiting factor.
- Larger and faster buses are typically in the more expensive servers. There is often no way to increase the capacity of the buses' bandwidth without replacing the servers. However, the largest servers are more configurable. Check with server providers for specifications.

## Disk / RAID / SAN Interfaces

The interfaces you use in your system can affect reliability and performance.

- Larger drives, all else being equal, increase mean seek time.
- Use the information in the table below to inform your choice of interface.

Interface	Benefits	Disadvantages	Notes
SCSI	<ul style="list-style-type: none"><li>• Supports forcing data to be written to disk, improving recoverability</li><li>• SCSI with TCQ supports multiple I/O requests</li><li>• Supports hot-swapping</li><li>• SCSI can have up to 15 drives per channel.</li><li>• Less restrictive on physical cable length</li></ul>		Overloading the channels increases the chance of hitting the transfer rate limit.
IDE	<ul style="list-style-type: none"><li>• Supports hot-swapping</li></ul>	Can only handle one outstanding I/O	

	<ul style="list-style-type: none"> <li>• IDE has high transfer rates only if there is one drive attached per channel</li> <li>• Tend to have greater capacity than SCSI</li> <li>• Tend to be cheaper than SCSI drives per GB</li> </ul>	request per channel	
SATA	<ul style="list-style-type: none"> <li>• SCSI with TCQ supports multiple I/O requests</li> <li>• Supports hot-swapping</li> <li>• Most are explicitly designed to support only one drive per channel; however, multiple SATA channels of 2 to 12+ on interface cards are also available</li> <li>• Tend to have greater capacity than SCSI</li> <li>• Tend to be cheaper than SCSI drives per GB</li> </ul>		
SAS	<ul style="list-style-type: none"> <li>• Very fast.</li> <li>• Supports SCSI protocol.</li> <li>• Allows for a larger number of disks than SCSI.</li> </ul>		<ul style="list-style-type: none"> <li>• Applicable to DAS only.</li> <li>• Replacement technology for parallel SCSI.</li> <li>• Backward compatible with SATA drives.</li> </ul>

### ***Disk Topology (Direct Attach/SAN/NAS)***

The disk topology that you use in your system can affect reliability and performance.

- Minimal latency on the I/O subsystem that serves the server running SQL Server is crucial. Slow response from the I/O subsystem cannot be compensated for by adding other types of resources (like CPU or memory), but can influence and cause issues throughout the farm. Plan for minimal latency before deployment, and monitor your existing systems as described in the section on [Updated recommendations for monitoring](#).

- Use the information in the table below to inform your choice of topology.

Topology	Benefits	Disadvantages	Notes
SAN	<ul style="list-style-type: none"> <li>• Can serve multiple servers</li> <li>• No limitations on the number of disks that can be accessible</li> <li>• Easier to install additional servers Easier to manage many servers</li> <li>• Easier to reallocate disk storage between servers</li> <li>• Maintenance costs tend to be lower than DAS</li> </ul>		
DAS	<ul style="list-style-type: none"> <li>• Higher maximum bandwidth</li> <li>• Easier to manage for a smaller number of servers</li> <li>• Initial overhead costs are lower than SAN</li> </ul>	<ul style="list-style-type: none"> <li>• Deployed per server</li> <li>• The number of disks is limited by the number of slots in the server and the type of interface used</li> </ul>	<ul style="list-style-type: none"> <li>• Consider DAS if you are experiencing bottlenecked workloads</li> <li>• When the limit on the number of DAS for a particular server is reached, you must deploy an additional server running SQL Server</li> </ul>
Networked storage		<ul style="list-style-type: none"> <li>• I/O response time required for SQL Server cannot be guaranteed nor maintained in a NAS environment.</li> <li>• iSCSI can only support light I/O traffic.</li> </ul>	The use of NAS is discouraged due to inability to ensure sufficient latency. If networked storage is required, use iSCSI on an iSCSI-dedicated Gigabit Ethernet, rather than NAS.

## *Network topology recommendations*

Plan your network connections within and between farms. Our recommendation is to use a network with low latency.

- All servers in the farm should have LAN bandwidth and latency to the server running SQL Server (up to 1 millisecond (ms) latency).
- We have not tested a deployment of SharePoint Products and Technologies in which a server running SQL Server is deployed in a WAN topology – remotely from other components of the farm with a network latency greater than 1 ms, therefore, we do not recommend this topology.
- Plan for an adequate WAN network if you are planning to use SQL Server Mirroring or SQL Server Log Shipping to keep a remote site up-to-date.

## **Physical storage recommendations**

The disks and arrays you choose, and how you place data on them can significantly affect system performance. If you are unfamiliar with RAID, consult the following resources:

- For an introduction to the types of RAID used with SQL Server, see [RAID Levels and SQL Server](http://go.microsoft.com/fwlink/?LinkID=105581&clcid=0x409) (http://go.microsoft.com/fwlink/?LinkID=105581&clcid=0x409).
- For a comparison of RAID types used with SQL Server, see [Comparing Different Implementations of RAID Levels](http://go.microsoft.com/fwlink/?LinkID=105582&clcid=0x409) (http://go.microsoft.com/fwlink/?LinkID=105582&clcid=0x409)

## **Use appropriate disks and RAID arrays**

- More and faster disks or arrays are better for performance – the key is to maintain low latency and queuing on all disks (see the section on [Updated recommendations for monitoring](#) for details).
- For high availability and performance (random read/write), configure your array for RAID10.
- Consult your storage hardware vendor or documentation before configuring RAID arrays. Take into account whether a database would benefit from faster random read response time (like static web content) where RAID5 and RAID10 provide similar performance, or a faster random write response time (like a collaboration Site with mixed read-write usage) where RAID has the advantage.
- When configuring a RAID array, it is crucial to align the file system to the offset supplied by the vendor. In the absence of vendor guidance, refer to the [SQL Server Predeployment I/O Best Practices](http://go.microsoft.com/fwlink/?LinkID=105583&clcid=0x409) (http://go.microsoft.com/fwlink/?LinkID=105583&clcid=0x409).

## **Separate and prioritize your data among disks**

Ideally, the **tempdb**, content databases and SQL Server transaction logs should all be on separate physical hard disks.

- When prioritizing data among faster disks, use the following ranking:
  1. **tempdb** data and transaction logs
  2. Database transaction log files.
  3. Search database.
  4. Database data files.

**Note:** In a heavily read-oriented portal, prioritize data over logs.
- Testing and customer data have shown that Office SharePoint Server farm performance can be significantly impeded by insufficient disk I/O for the **tempdb**. To avoid this issue, allocate

dedicated disks for the **tempdb** file. If a high workload is projected or monitored (*Avg. Disk Sec/Read* or *Avg. Disk Sec/Write* is greater than 20 ms), you may need to ease the bottleneck by either separating the files across disks, or replacing your disks with faster disks.

- For best performance, place the tempdb file on a RAID 10 array. The number of data files should be equal to the number of core CPUs, and of equal size.
- Separate database data and transaction log file across different disks. If files must share disks because the files are too small to warrant a whole disk or stripe or you have a shortage of disk space, put files on the same disk that have different usage patterns, so that simultaneous access requests will be unlikely.
- Consult your storage hardware vendor for how to configure all logs and the Search databases for write optimization for your particular storage solution.
- Pre-size your data and log files.
- Do not rely on AUTOGROW, instead manage the growth of data and log files manually. You may leave AUTOGROW ON for safety reasons, but you should proactively manage the growth of the data files.
- Allocate dedicated spindles for the Search database.

## Follow vendor configuration recommendations

For optimal performance when configuring a physical storage array, adhere to the hardware configuration recommendations supplied by the storage vendor, rather than relying on the operating system's default values.

If you do not have guidance from your vendor, we recommend that you use the DiskPart.exe utility to configure storage for SQL Server. For details, see [Predeployment I/O Best Practices](http://go.microsoft.com/fwlink/?LinkID=105583&clcid=0x409) (<http://go.microsoft.com/fwlink/?LinkID=105583&clcid=0x409>).

## Updated planning recommendations for front-end Web servers

Planning your front-end Web servers by using the recommendations below can enhance system performance.

### Use 64-bit servers for front-end Web servers

We highly recommend that you install front-end Web servers on 64-bit Office SharePoint Server 2007 on a 64-bit operating system, unless you have a significant business reason not to.

### Carefully configure 32-bit servers

If you must run 32-bit servers, follow these recommendations:

- **Do not use the /3gb switch for 32-bit systems**

If you are running 32-bit front-end Web servers, we recommend that you do not use the **/3gb** switch in Windows Server® 2003 to change the 2 GB of virtual address space to 3 GB for all user mode processes. We recommend against using the /3gb switch because most SharePoint site traffic involves sending large amounts of data through the operating system, and leaving only 1 GB of address space for the operating system can destabilize the computer. For more information, see the Knowledge base article, [The Windows Server 2003 /3GB switch is not supported in Windows SharePoint Services 2.0 or in later versions or in SharePoint Portal Server 2003 SP2 or in later versions](http://go.microsoft.com/fwlink/?LinkId=105919&clcid=0x409) (<http://go.microsoft.com/fwlink/?LinkId=105919&clcid=0x409>).

- **Mixing 32-bit and 64-bit servers may impact load balancing**

You can run an environment that has some front-end Web servers running the 32-bit version of Office SharePoint Server and others running the 64-bit version. However, there is a risk that the 32-bit front-end Web servers may become overloaded if your network load balancer is configured to use a less-intelligent model as such round robin. We recommend that you configure your load balancer to manage distribution based on load.

## **Use Kerberos authentication for farms with intense usage profiles**

We recommend that for farms in which you serve a large number of requests for a given time unit, you use Kerberos authentication if it meets your other business needs. Kerberos can return authentication request results quickly because it uses caching.

## **Use 4 to 5 front-end Web servers per server running SQL Server**

In our tests, we have observed that a farm delivers maximum throughput when it is being served by 4 to 5 front-end Web servers for each computer running SQL Server. Use a load balancer to evenly distribute requests across the front-end Web servers to minimize the load on any individual server.

## **Increase space allocated for index files**

In the topic [Estimate performance and capacity requirements for search environments](http://go.microsoft.com/fwlink/?LinkID=105576&clcid=0x409) (<http://go.microsoft.com/fwlink/?LinkID=105576&clcid=0x409>), we recommended that you estimate space requirements for an index server as 2.5 times the size of the index files. We now recommend that you increase the space for an index server to 2.85 times the size of the index files.

## **Do not use Web gardens**

The use of Web gardens (IIS application pools that are supported by multiple worker processes) is not recommended for Enterprise Content Management sites because it has negative effects on page output caching. Generally, for SharePoint Products and Technologies, we have not found that Web gardens improve or detract from performance. Given the complexity of managing Web gardens, we do not recommend them.

## **Consider additional resources for systems with many active workflows**

In a system that has many active workflow instances, consider adding additional RAM, additional front-end Web servers, and additional resources for your computers running SQL Server.

## **Use dedicated front-end Web servers for non-end-user services**

A dedicated front-end Web server is a Web server that is not connected to the load balancer exposed to your end users. We recommend that you use dedicated front-end Web servers for running any non-end-user services that are expensive, such as:

- Search indexing
- Central Administration
- Profiles
- Excel Services

## Enable only the features you need

Office SharePoint Server 2007 is a rich platform that offers many features. Your front-end resources will be better utilized if you only enable the features relevant to your user base. For details on disabling features, see [Working with Features](http://go.microsoft.com/fwlink/?LinkID=105337&clcid=0x409) (<http://go.microsoft.com/fwlink/?LinkID=105337&clcid=0x409>).

## Deploying Service Pack 1

The following recommendations are excerpted from the topic: [Deploy software updates for Office SharePoint Server 2007](http://go.microsoft.com/fwlink/?LinkID=105920&clcid=0x409) (<http://go.microsoft.com/fwlink/?LinkID=105920&clcid=0x409>).

We recommend that you follow the process and procedures in this section for most deployment scenarios, from stand-alone server deployments to very large server farms. The typical process for installing software updates consists of copying the files to a computer and then running either the SharePoint Products and Technologies Configuration Wizard or the Psconfig command-line tool to upgrade the databases.

### Note

In this article, we use the term *software update* as a general term for all update types, including any service pack, update, update rollup, feature pack, critical update, security update, or hotfix used to improve or fix this software product.

For any deployment other than single server, such as Web servers in a server farm, you must visit the Microsoft download center to download and then install the software update. The software update will not be installed automatically, even if Automatic Updates are enabled on your Web servers. You cannot use the Microsoft Update Web site to initiate the software update installation.

The software update checks the registry and blocks automatic installation on any Web server that does not contain the value **singleserver** in the **SERVERROLE** key.

If you need to determine whether to manually download and install the software update, use a registry editor to verify the value in the following key:

**HKLM\Software\Microsoft\Shared Tools\web server extensions\12.0\WSS\SERVERROLE**

You must install service packs for Microsoft Windows SharePoint Services 3.0 before you install the Microsoft Office SharePoint Server 2007 software updates.

### Note

Do not install a beta version of a Office SharePoint Server 2007 software update in a production environment.

In server farm deployments, you must update all the Office SharePoint Server 2007 Web servers to the same software update version.

In this section:

- [Before you begin](#)
- [Overview of installation sequence](#)
- [Perform installation steps](#)
- [Verify installation](#)
- [Use the Updates folder](#)
- [Update language template packs](#)
- [Known issues](#)

## Before you begin

This section provides an overview of what you must do before you install a software update.

You must remove the Microsoft Office SharePoint Server 2007 front-end Web servers and application servers from service for the duration of the software update installation. We recommend that you schedule the installation of the software update for a time that causes the least amount of disruption for your users. You should communicate the proposed schedule to the users and the key people involved with the Web sites hosted on the Office SharePoint Server 2007 servers and, if necessary, adjust the schedule.

When you first installed your server farm, if you used an upgrade method—either in-place or gradual—and upgrade jobs are still in progress, the software update installation might fail. To ensure that none of the upgrade processes are running, you must view the Timer Job Status page on the SharePoint Central Administration Web site. If you see any upgrade jobs listed, you must allow the upgrade to finish before you install the software update.

The upgrade jobs that appear on the Timer Job Status page result from sites that are in the process of being upgraded. These may result if you have an ongoing gradual upgrade or if you selected the in-place upgrade option in the SharePoint Products and Technologies Configuration Wizard. After you have verified that no upgrade items are listed on the Timer Job Status page, you can continue installing the software update.

In a shared services configuration, the order in which you upgrade the parent server farm and the child server farm is not critical; however, we suggest that you install the software update on the parent server farm before you install it on child server farm.

You must use the following procedure to build and register the Web service proxy to import Business Data Catalog Web service packages in the parent server farm and successfully connect to them from the child server farm if you are using the Business Data Catalog in a shared services configuration and both of the following are true:

- Parent server farm has a software update installed.
- Child server farm is running the released version.

### ► To build and register the Web service proxy

1. Compile the Web service proxy into a signed DLL, commonly referred to as an assembly.
2. The Business Data Catalog package should define **WebServiceProxyType** as:

```
<Property Name="WebServiceProxyType"  
Type="System.String">assemblyName</Property>
```

Where *assemblyName* is an assembly qualified type name for proxy class.

3. To make the functionality in the assembly available to any application that might need to use it, you must use the .NET Framework Global Assembly Cache tool (Gacutil) to register the signed assembly as a shared assembly in the global assembly cache (GAC) on each front-end Web server. You must perform this step on front-end Web servers that will use the application in both the parent server farm and child server farm. To install the assembly and overwrite the existing assembly, you should use the combined switch **/if**, as in:

```
gacutil /if AssemblyName
```

#### Note

To enable Office SharePoint Server 2007 Enterprise Search scenarios, you must also register this assembly on the shared services application Web server in the

parent server farm.

4. Run the **iisreset /noforce** command on each Web server on which you used Gacutil to register the assembly.
5. On the shared services application Web server, in the parent server farm, you must import the Business Data Catalog application XML package.

The child server farm is now able to use the metadata from the Business Data Catalog from the parent server farm.

## Pre-upgrade preparation

Before you install a software update, we recommend the following:

- If there are orphaned objects in the content databases—orphans are items that do not have any parent or child relationships—the software update installation will fail. To make sure that the installation can succeed, you must either fix the relationship or drop the orphans before you begin the software update installation. For more information on a resolution for when the content database contains one or more orphaned objects, see the Microsoft Knowledge Base article titled [Error message when you try to upgrade Windows SharePoint Services 2.0 to Windows SharePoint Services 3.0: "Upgrade has encountered one or more lists that were not updated by Prescan.exe and must exit"](http://go.microsoft.com/fwlink/?LinkId=105755) (<http://go.microsoft.com/fwlink/?LinkId=105755>).
- If you customized a predefined site template by directly modifying the site template files—something we do not recommend doing—the software update installation may overwrite some of the files that you modified, and your customizations in those files will be lost. You must reapply any site-template customizations after you install the software update.
- Stop the World Wide Web publishing service (w3svc) on all front-end Web servers to disconnect all the users from the server farm. In server farms with multiple front-end Web servers, if you allow users to connect after the files and databases have been updated on one Web server, and the other Web servers have not been updated, users will not be able to browse the Web sites.



### Note

If you manually stop the World Wide Web Publishing service, you must manually start it at the end of the installation.

- Before you start the back up you should clean up your environment by performing the following steps.
  - Defragment all of the SQL Server database indexes.
  - Make sure that there is adequate hard drive space in your database files volumes, tempdb volumes, and Windows temporary folder on the servers running SQL Server, front-end Web servers, and application servers. The upgrade operation writes the progress of various steps into an upgrade log that can take up disk space, but if you plan for extra storage you should not encounter issues due to space limitations.
  - If any of your databases contain more than the number of site collections recommended in the earlier [Information Architecture Recommendations](#) section, you should load-balance your site collections across multiple databases.
  - Follow best practices around content database sizing before you perform any upgrade operations.
  - Make sure that you follow the recommendations concerning SQL Server page fill factor and other storage planning best practices before you begin upgrade. For more

information about storage best practices, see [Performance recommendations for storage planning and monitoring](http://go.microsoft.com/fwlink/?LinkId=105890&clcid=0x409) (http://go.microsoft.com/fwlink/?LinkId=105890&clcid=0x409)

- Back up the server farm before you start the software update installation. You should create a backup of search and all databases. We recommend that you follow these guidelines:
  - **Search:** Use the full backup operation from SharePoint Central Administration or Stsadm to back up search. The backup operation includes both the Shared Services Provider (SSP) database and search index file. Note: Before you back up, verify that the drive that you are backing up to has enough free space to back up the entire farm. Even though you are only backing up the search SSP, if you do not have free space for the entire farm, the backup operation will fail. For more information, see [Back up Office SharePoint Server 2007 by using built-in tools](http://go.microsoft.com/fwlink/?LinkId=105758) (http://go.microsoft.com/fwlink/?LinkId=105758).
  - **Configuration database and Central Administration content database:** Perform a full backup operation with either Stsadm or SQL Server. If you are using SQL Server, use the simple recovery model, so that your transaction log is truncated.
  - **Content databases:** Perform a full backup operation with either Stsadm or SQL Server to back up all content databases. If you are using SQL Server, use the simple recovery model, so that your transaction log is truncated.
  - **Single sign-on (SSO) database:** Perform a full backup operation with SQL Server to back up the SSO database. If you are using SQL Server, use the simple recovery model, so that your transaction log is truncated.
  - **Front-end Web server:** If you have customized the front-end Web server, or are unsure of the extent of the customizations to your Web applications, we recommend that you make a backup image of your front-end Web server. Make sure you have a backup of any solution packages that you have deployed on your front-end Web servers.

**Note:** Ideally, if you are customizing front-end Web computers the customization should be managed by using a robust build process or script that allows the customizations to be applied to a new computer.

If you experience an unrecoverable failure during upgrade you might have to restore your server from the backup image you created. You would need to manually apply any customizations to your front-end Web server.



#### Note

We recommend that you back up the server farm after you have verified that the software update installation succeeded.

After you have backed up all of your databases, use the SQL Server DBCC shrinkfile command to free unused log space, making the logs as empty as possible. For more information, see [Shrinking the Transaction Log](http://go.microsoft.com/fwlink/?LinkId=105233) (http://go.microsoft.com/fwlink/?LinkId=105233). It is a best practice to verify that you can restore the databases.

You must download the correct software update file for your hardware and language. The pattern for the software update naming convention is *productnamerrr-kby-xnn-fullfile-lang.exe*, where:

- *productname* is a short identifier for the name of the released product.
- *rrr* is a description of the release. For example, Service Pack 1 would be **sp1**.

- *y* is a number that corresponds to the Knowledge Base article about the software update.
- *nn* is a number indicating the hardware architecture, either **x86** or **x64**.
- *lang* is the language of the software update. For example, U.S. English is **en-us**.

For example, the file name for the Office SharePoint Server 2007 with Service Pack 1 file in U.S. English and for x86-based hardware is `officeserver2007sp1-kb936984-x86-fullfile-en-us.exe`.

## ***Overview of installation sequence***

The following approach updates the databases from one of the servers hosting the Central Administration Web site. After you install the software update on the first server, the other front-end Web and application servers can simply connect to the updated database, rather than attempt to upgrade the database.

You must update the servers in your server farm in the following order:

1. The files from the software update must be installed on all the application and Web servers in the server farm by running the software update installation on each application or Web server up to the point where the dialog box with the following message is displayed:

You must run Setup to install new binary files for every server in your server farm. If you have multiple servers in your server farm, run Setup and the configuration wizard on the other servers now, and then return to this server and click OK to continue.

### **Note**

If you started the installation in silent mode, using the **/q** switch, the SharePoint Products and Technologies Configuration Wizard does not automatically start. To continue the upgrade, you need to force the upgrade by either manually starting the wizard or running the **psconfig** command with arguments to force an in-place, build-to-build upgrade. For specific information, in the [Perform installation steps](#) section, follow the "To force a software update" procedure.

2. Complete the software update by clicking **OK** in the dialog box on one Web server that hosts the Central Administration Web site in the server farm.
3. Complete the software update on the remaining Web and application servers, one server at a time, for the rest of the server farm.

## ***Perform installation steps***

You must install the software update on each Office SharePoint Server 2007 server to the point that the files are copied to all the servers in the server farm. You can then return to the server that hosts the Central Administration Web site to complete the installation. After you complete the installation on the server that hosts Central Administration, you can complete the installation on each of the other servers.

### **Note**

You must ensure that the files for the Windows SharePoint Services 3.0 software update are installed on the servers before you install the Office SharePoint Server 2007 software update. If the Windows SharePoint Services 3.0 software update has not been installed, a dialog box prompts you to download and install the Windows SharePoint Services 3.0 software update. You only have to run the SharePoint Products and Technologies Configuration Wizard once after you install the Office SharePoint Server 2007 software update.

To ensure that you have the correct permissions to install the software update and run the SharePoint Products and Technologies Configuration Wizard, we recommend that you add the account for the **SharePoint Central Administration v3** application pool identity to the Administrators group on each of the local Web servers and application servers and then log on by using that account.

For the account that you use to install the software update and run the SharePoint Products and Technologies Configuration Wizard, the minimum permissions are:

- Member of the Administrators group on the local computer that runs Office SharePoint Server 2007.
- In SQL Server, the account must be:
  - Authorized to access all SharePoint Products and Technologies databases.
  - Granted the Database Creators (**dbcreator**) fixed server role.
  - Granted the Security Administrators (**securityadmin**) fixed server role.

In many IT environments, database administrators (DBAs) create and manage databases. Security policies and other policies in your organization might require that DBAs create the databases needed by Office SharePoint Server 2007.

#### **Note**

For information about how to deploy Office SharePoint Server 2007 in an environment in which DBAs create and manage databases, see [Deploy using DBA-created databases \(Windows SharePoint Services\)](http://go.microsoft.com/fwlink/?LinkID=86818&clcid=0x409) (<http://go.microsoft.com/fwlink/?LinkID=86818&clcid=0x409>).

You can install the software update by logging on to the server directly or by connecting through a Terminal Services console session.

**Note** For information about how to use console sessions, see [Microsoft Knowledge Base article 278845: How to Connect to and Shadow the Console Session with Windows Server 2003 Terminal Services](http://go.microsoft.com/fwlink/?LinkId=98317) (<http://go.microsoft.com/fwlink/?LinkId=98317>).

## Install the software update

This section includes all of the procedures required to install a software update successfully in any size server farm. If you are in a large server farm you should read the Large farm optimization section later in this document.

The following procedure provides the steps to:

- Make all software update files available on all servers in your server farm.
- Complete the update from one of the servers hosting the Central Administration site.
- Finish updating the remaining servers in the server farm.

#### **Note**

You must perform steps 1 through 8 from the following procedure on every Office SharePoint Server 2007 server in the server farm before you complete the installation on any one Office SharePoint Server 2007 server.

### **To install a software update**

1. Disconnect users from the server farm by stopping the World Wide Web Publishing service (w3svc) on all Web servers.
2. Download and install the appropriate Windows SharePoint Services 3.0 software update

for all servers in your server farm.

### **Important**

At the end of the Windows SharePoint Services 3.0 software update, do not run the SharePoint Products and Technologies Configuration Wizard.

3. Download and install the appropriate Office SharePoint Server 2007 software update for all servers in your server farm.
4. At the end of the software update installation, the SharePoint Products and Technologies Configuration Wizard starts.

### **Note**

If the wizard does not start automatically, click **Start**, point to **All Programs**, point to **Administrative Tools**, and then click **SharePoint Products and Technologies Configuration Wizard**.

5. On the SharePoint Products and Technologies Configuration Wizard Welcome page, click **Next**.
6. In the dialog box that notifies you that some services might need to be restarted during configuration, click **Yes**.
7. On the **Completing the SharePoint Products and Technologies Configuration Wizard** page, click **Next**.

8. When the dialog box about installation in a server farm appears, **do not** click **OK**. Instead, leave each server with the following dialog box displayed:

You must run Setup to install new binary files for every server in your server farm. If you have multiple servers in your server farm, run Setup and the configuration wizard on the other servers now, and then return to this server and click **OK** to continue.

9. When the dialog box from the previous step is displayed on all the application servers and Web servers in the server farm, use one Web server that hosts the Central Administration Web site to finalize the installation.

### **Notes**

We recommend that you install the software update on an application server that is hosting the Central Administration Web site, then the other application servers, and finally the front-end Web servers.

If you are hosting your Central Administration Web site on a front-end Web server, then we recommend that you install the software update on the front-end Web server hosting the Central Administration Web site, then the application servers, and finally the remaining front-end Web servers.

10. On the server you selected in the previous step, click **OK**.
11. On the Configuration Successful page, click **Finish**.
12. After you have finished updating one Web server that hosts the Central Administration Web site, you should follow the procedures in the "Verify installation" section on this one Web server to ensure that the software update installation was successful.
13. Continue updating the remaining computers in the server farm, one at a time, by clicking **OK** in the dialog box.

### **Note**

It is important that the SharePoint Products and Technologies Configuration Wizard

perform the configuration procedures on only one computer at a time.

14. When the software update installation and configuration is complete on all the Web servers in the server farm, make the Web servers available to users by manually starting the World Wide Web Publishing service on each server on which you manually stopped the service.

If you completed the "To detach content databases" procedure, depending on if you configured additional computers to upgrade the content databases, you must use one of the following procedures to attach the content database after the software update installation is complete.

#### **Note**

If you did not follow the "To detach content databases" procedure, you can skip the "To attach the content database" procedures.

If you did not configure additional computers specifically to upgrade the content databases, you will need to follow the "To attach the content database from the command line" procedure. This is because using this procedure initiates the content database upgrade upon attach.

#### ▶ **To attach the content database from the command line**

- To attach the database, enter the following command:

```
stsadm -o addcontentdb -url <http://backupservername:port> -databasename  
<ContentDBName> -databaseserver <NewPrincipalServer>
```

If you did configure additional computers specifically to upgrade the content databases, you can use the following procedure to attach the content database to the updated computers.

#### ▶ **To attach the content database**

1. Click **Start**, point to **All Programs**, point to **Administrative Tools**, and then click **SharePoint 3.0 Central Administration**.
2. On the Central Administration site, click **Application Management**.
3. On the Application Management page, in the **SharePoint Web Application Management** section, click **Content databases**.
4. On the Manage Content Databases page, click **Add a content database**.
5. Enter the information for the content database you detached earlier.
6. Repeat steps 4 through 6 for every content database you want to attach.
7. If you did not follow the **preparetomove** step in the "To detach content databases" procedure, you must run the following operation after attaching the content databases to fix the synchronization issue:

```
stsadm -o preparetomove -oldcontentDB <GUID> -newcontentDB <database_name>
```

If you are using shared services in your environment, you must complete the following procedure for each shared service provider database. You only need to perform this procedure from one front-end Web server.

#### ▶ **To configure SSP database access**

- From the command line, run the following command:

```
stsadm -o editssp -title <SSPName> -ssplogin <username> -ssppassword  
<userpassword> -sspadminsite <newSSPDatabaseServerName>
```

For information, see Editssp: Stsadm operation (Office SharePoint Server).

You must perform the following procedure on all indexers and query servers in your server farm if either of the following conditions is true:

- You are running in a least-privileges scenario.
- The account that you are using for the search service is either:
  - Not an Administrator on the local computer.
  - Not a member of the server farm administrator account.

### ► To start the search service

1. Open a Command Prompt window.
2. To identify the computers running an instance of the online search service, use the following command:  
**stsadm -o osearch -action list**
3. Log on to each computer, either locally or through a remote connection, that is returned in the list from the previous step and run the following command:  
**stsadm -o osearch -action start**
4. To identify the computers that are running an instance of the online Windows SharePoint Services search service, run the following command:  
**stsadm -o spsearch -action list**
5. Log on to each computer, either locally or through a remote connection, that is returned in the list from the previous step and run the following command:  
**stsadm -o spsearch -action start**

## ***Large farm optimization***

In very large server farms, installing a software update with the content databases attached is not practical in terms of downtime. In the scenario where you have a large number of sites or many Web servers, to minimize the downtime required to upgrade, we recommend that you perform the additional steps of running the Stsadm **prepairetomove** operation and then detach the content databases.

For best performance with the upgrade operations, you should use four or five front-end Web servers per database server. You must configure alternate access mappings on these temporary front-end Web servers to match the original servers. If the alternate access mappings are not identical, the content databases may be upgraded with the wrong URLs within their site content. This will result in certain pages not displaying correctly, you must contact Microsoft Product Support Services to correct this problem. For more information, see [Plan alternate access mappings \(Office SharePoint Server\)](http://go.microsoft.com/fwlink/?LinkId=105997&clcid=0x409) (<http://go.microsoft.com/fwlink/?LinkId=105997&clcid=0x409>).

### ► To prepare to move the content databases

1. In Windows Server 2003, open a Command Prompt window and change the directory to where the Stsadm command-line tool is located, usually at the following path:  
`%COMMONPROGRAMFILES%\Microsoft Shared\web server extensions\12\BIN`
2. Before you detach the databases, you must run the **prepairetomove** operation to make sure that the content database will be included in the membership and profile

synchronization after you reattach the content database. Run the following operation on the command line:

```
stsadm -o preparetomove -contentDB <database_server:database_name>
```

 **Note**

If you do not run this operation before you detach the content database, then the membership and profile information in the content database is static and will not be synchronized after upgrade.

For more information about the Stsadm **preparetomove** operation, see [Preparetomove: Stsadm operation \(Office SharePoint Server\)](#).

 **Note**

Unless you are dealing with a very large server farm, you do not need to follow this procedure.

 **To detach content databases**

1. To detach a content database using Stsadm, open a command prompt and change directories to `%COMMONPROGRAMFILES%\Microsoft Shared\web server extensions\12\BIN`.
2. Run the following operation from the command line:

```
stsadm -o deletecontentdb -url http://computername -databasename
```

In this operation, **-url** specifies the Web application from which the content databases will be detached and **-databasename** specifies the name of content database to be detached.

 **Note**

If your database server is on a separate server, you need to use the **-databaseserver** parameter to specify the database server name.

After you upgrade your server farm, you must attach the content databases back to the server farm. You can only attach one content database to the server farm at a time, because when you attach the databases to the upgraded server farm the content database is upgraded automatically.

If you want to streamline the upgrade process even further, you can configure additional computers as Office SharePoint Server 2007 Service Pack 1 Web servers in a single-computer server farm, we recommend 4 to 5 Web servers. Then, to perform a parallel upgrade of the content databases, use these Web servers to upgrade the content databases while they are detached from the original server farm.

After you detach the upgraded content databases from the temporary Web server, and attach them back to the original server farm, the content databases are ready for service. At this point, you should remove any content databases from the previous version and then back up the server farm.

 **Note**

The limiting factor for this method is that you cannot simultaneously update more than one content database for each web application—even if you use multiple computers.

## Verify installation

After you install a software update, you should verify that the installation was successful by reviewing the upgrade log file (Upgrade.log), as described in the following procedure.

### ► To view the upgrade log file

1. Use Windows Explorer to navigate to the %COMMONPROGRAMFILES%\Microsoft Shared\web server extensions\12\LOGS folder.
2. Use a text editor to open the Upgrade.log file.
3. Scroll to the date on which you installed the software update.
4. Search, or visually scan, for the following entries:  
Finished upgrading SPFarm Name=<Name of Configuration Database>  
In-place upgrade session finishes. Root object = SPFarm=<Name of Configuration Database>, recursive = True. 0 errors and 0 warnings encountered.  
If you find these entries, the installation was successful.
5. If you do not find the entries from the previous step, you can identify specific issues that may have contributed to the failure by searching, or visually scanning, through the Upgrade.log file for the following terms:
  - fail
  - error

After you identify and resolve the blocking issues, use the "To force a software update" procedure later in this section.

In some configurations, the SharePoint Timer Service (OWStimer) account—which, by default, is the same account used by the **SharePoint Central Administration v3** application pool account—is configured with credentials that do not have permission to access the LOGS folder in %COMMONPROGRAMFILES%\Microsoft Shared\web server extensions\12\. If this is the case, part of the Upgrade.log is stored in the temporary storage folder of the account that is running the SharePoint Timer service.

To write all available logging information, including verbose output and detailed debugging information, to the log files for the software update installation, run the following command:

```
msiexec /p <PatchPackage> /l*vx %temp%\patch.log
```

<PatchPackage> is the path to the software update file.

You can find the log file in the temporary file location with the file name msi\*.log.

#### Note

You can enable Windows Installer logging before you start the software update installation again. To enable logging for Windows Installer, see [Microsoft Knowledge Base article 99206: How to enable Windows Installer logging](http://go.microsoft.com/fwlink/?LinkID=99206) (<http://go.microsoft.com/fwlink/?LinkID=99206>).

In addition to the previous procedure, verify that the update was successful by using the SharePoint Central Administration Web site to view the version number on the Servers in Farm page.

#### Note

If Windows SharePoint Services 3.0 has been installed as part of a Office SharePoint Server 2007 single-click installation, when you open Add/Remove

Programs from Control Panel, there is no Windows SharePoint Services 3.0 entry. Then, when you install a Windows SharePoint Services 3.0 software update, there will not be an entry for the software update either. In order to confirm that the software update was installed, you should use the following procedure.

### ► To view the Servers in Farm page

1. Use one of the following methods to open the Servers in Farm page:
  - On the Central Administration home page, click **Operations**. Then, on the Operations page, in the **Topology and Services** section, click **Servers in farm**.
  - From Internet Explorer, connect to the following Web page:  
`http://ServerName:Port/_admin/FarmServers.aspx`  
*ServerName* is the name of the server, and *Port* is the port that is configured for the Central Administration Web site.
2. On the Servers in Farm page, next to **Version**, verify the version number of each server in the farm to verify that each one has been updated to the new binary version.

The following Office SharePoint Server 2007 version numbers are correct:

- Release 12.0.0.4518
- October public update 12.0.0.6035

For more information about the software updates in the October public update, see [Microsoft Knowledge Base article 937832: Description of the security update for SharePoint Server 2007: October 9, 2007](#)

(<http://go.microsoft.com/fwlink/?LinkId=102083&clid=0x409>).

- Service Pack 1 12.0.0.6219

If the version number matches the version number for the software update, you have succeeded in updating the server. If the version number is not correct, the software update installation did not complete successfully. To identify and resolve the blocking issues, follow the "To view the upgrade log file" procedure earlier in this article.

If you need to investigate the success of the software update installation in more depth, use the following procedure to verify version numbers on certain files and verify certain keys in the registry.

### ► To perform advanced installation verification

1. You can examine the version number of certain files in  
`%COMMONPROGRAMFILES%\Microsoft Shared\web server extensions\12\ISAPI`  
The following Office SharePoint Server 2007 Microsoft.Office.Server.dll version numbers are correct:
  - Release 12.0.4518.1016
  - October public update 12.0.6036
  - Service Pack 1 12.0.0.6219
2. In registry editor, verify that the value is correct in the **DisplayVersion** key in the following locations.
  - For x86: **HKEY\_LOCAL\_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall\OSERVER**
  - For x64:

## HKEY\_LOCAL\_MACHINE\SOFTWAREWow6432Node\Microsoft\Windows\CurrentVersion\Uninstall\OSERVER

You can also verify that the software update installation was successful by using SQL Query Analyzer to examine the SQL Server schema. Although the version of the DLL files and the registry are updated during the first part of an upgrade—when the files are being copied—the SQL Server schema is only upgraded after the SharePoint Products and Technologies Configuration Wizard is run. You should use the following procedure to determine if the SharePoint Products and Technologies Configuration Wizard was run after the software update.

To verify through direct examination of the SQL schema

- This SQL Server query can be run on any SharePoint Products and Technologies database to track all the upgrades run on the database in the GUID 00000000-0000-0000-0000-000000000000:

### **SELECT \* FROM Versions**

The very last version that maps to the GUID above should equal the current version of the product.



### **Important**

Microsoft generally does not support running queries against the databases that are used by SharePoint Products and Technologies. This query is an allowed exception because it deals with metadata about the database. Direct queries can adversely impact system performance and reliability. For more information about the effects of direct changes to databases, see the knowledge base article: [Support for changes to the databases that are used by Office server products and by Windows SharePoint Services](http://go.microsoft.com/fwlink/?LinkID=105589&clcid=0x409) (<http://go.microsoft.com/fwlink/?LinkID=105589&clcid=0x409>).

If the installation did not succeed, you can run the SharePoint Products and Technologies Configuration Wizard again or you can use the following procedure to complete the configuration from the command line.



### **Note**

You can enable Windows Installer logging before you start the software update installation again. For information, see [Microsoft Knowledge Base article 99206: How to enable Windows Installer logging](http://go.microsoft.com/fwlink/?LinkID=99206) (<http://go.microsoft.com/fwlink/?LinkID=99206>).

### **► To force a software update**

1. Force a software update operation by opening a Command Prompt window and changing to the following directory:  
`%COMMONPROGRAMFILES%\Microsoft shared\web server extensions\12\bin\`
2. Type the following command:  
**psconfig -cmd upgrade -inplace b2b -wait -force**

## Use the Updates folder

If you need to build a new server to join an existing server farm, we recommend that you create an installation source location that already contains the software updates to match the level of software updates installed on your server farm by using the Updates folder. When you use this installation source to add new servers to your server farm, the software update is already applied and the version of the new server matches the rest of the servers in your server farm.

### ► To use the Updates folder

1. Copy the files from the released version source media for the product to a folder that you can use as an installation point for the servers in your server farm.
2. Download the appropriate software update package.
3. Extract the software update files, by using this command: `<package> /extract:<path>`. The **/extract** switch prompts you to provide a folder name for the files, for example, for x86 systems:

**wssv3sp1-kb936988-x86-fullfile-en-us.exe /extract:<C:\WSS>Updates**

`<C:\WSS>` is the location to which you copied the files that you extracted from the Windows SharePoint Services 3.0 released version.

#### Note

You must use the default location for the Updates folder. If you use the **SupdateLocation="path-list"** property to specify a different location, Setup stops responding.

4. Copy the files that you extracted from the Windows SharePoint Services 3.0 software update package to the Updates folder in the location where you previously copied the source for the released version.

**officeserver2007sp1-kb936984-x86-fullfile-en-us.exe**

**/extract:<C:\rtm\_product\_path>Updates**

`<C:\rtm_product_path>` is the location to which you copied the files that you extracted from the Office SharePoint Server 2007 released version.

5. Copy the files that you extracted from the Office SharePoint Server 2007 software update package to the Updates folder in the location where you previously copied the source for the released version. You must verify that the Svrsetup.dll file has been copied from the Office SharePoint Server 2007 software update package and you should delete the Wsssetup.dll file.
6. You can now use this location as an installation point, or you can create an image of this source that you can burn to a CD-ROM.

#### Note

If you extracted the software update files to a location to which you had previously copied the source for a released version, the source is updated and is ready to use.

For more information about using enterprise deployment tools to deploy updates, see the topic [Distribute product updates for the 2007 Office system](#).

If, however, you need to build a new server to join an existing server farm, but you have not created an updated installation source, you must follow this process closely.

### ► To build a server to join an existing farm

1. Install the product without any software updates and do not run the SharePoint Products and Technologies Configuration Wizard.

#### Notes

By not running the SharePoint Products and Technologies Configuration Wizard you do not define the location for the configuration database by creating the registry key

**HKEY\_LOCAL\_MACHINE\SOFTWARE\Microsoft\**

**Shared Tools\web server extensions\12.0\Secure\ConfigDB.**

2. Install the software update.
3. Run the SharePoint Products and Technologies Configuration Wizard at the prompt.

If you do not follow this process and you do run the SharePoint Products and Technologies Configuration Wizard after you install the released product, the SharePoint Products and Technologies Configuration Wizard reads the **ConfigDB** registry key and the SharePoint Products and Technologies Configuration Wizard displays: "Exception: System.InvalidOperationException: Operation is not valid due to the current state of the object". To address this problem, you must either modify the registry or use the command line to force the configuration to complete successfully.

Use registry editor to modify the contents of the **ConfigDB** registry key and then run the SharePoint Products and Technologies Configuration Wizard.

### ► To force an install after a failed configuration by modifying the registry

1. Install the software update and do not allow the SharePoint Products and Technologies Configuration Wizard to run.
2. Use a registry editor to modify the setup type to a clean install. Change the registry key to the following:  
**HKEY\_LOCAL\_MACHINE\SOFTWARE\Microsoft\Shared Tools\web server extensions\12.0\WSS\SETUPTYPE=CLEAN\_INSTALL**
3. Run SharePoint Products and Technologies Configuration Wizard to perform a disconnect operation.
4. Run SharePoint Products and Technologies Configuration Wizard to connect to your server farm.

Use the Psconfig command-line tool.

#### Note

For more information on using Psconfig, see Command-line reference for the SharePoint Products and Technologies Configuration Wizard (Office SharePoint Server).

### ► To force an install after a failed configuration (command line)

1. Install the product without any software updates and do not run the SharePoint Products and Technologies Configuration Wizard.
2. Install the software update and do not run the SharePoint Products and Technologies Configuration Wizard.
3. Open a Command Prompt window and run the following command:

```
psconfig -cmd configdb -connect -server <SQLServerName> -database  
SharePoint_Config_<dbname> -user <domainusername> -password <password> -  
cmd helpcollections -installall -cmd secureresources -cmd services -install -cmd  
installfeatures -cmd applicationcontent -install
```

## ***Update language template packs***

For each language template pack installed on a server that renders content, you must install updated language template packs. To install the language template packs, you can download updated language template packs through the Microsoft Download Center. However, we recommend that you browse to the Microsoft Update or Windows Update Web sites to detect the language template packs installed on your front-end Web server. An updated language template pack is installed for each language template pack that is currently installed.

### **Note**

It is necessary to install both the Windows SharePoint Services 3.0 Service Pack 1 language template pack and the Office SharePoint Server 2007 Service Pack 1 language template pack for each language template pack you have installed.

You must run the SharePoint Products and Technologies Configuration Wizard after updated language template packs have been installed for each currently installed language template pack.

Use the following procedure to create an installation point that you can use to install the language template pack with software updates already applied.

### **To use the Updates folder with language template packs**

1. Download the language template pack package for the released product.
2. Extract the files from the language template pack package.
3. Copy the extracted files to a folder that you can use as an installation point for the servers in your server farm.
4. Download the updated language template pack package for the released product.
5. Extract the files from the updated language template pack package.
6. Copy these extracted files to the Updates folder in the folder in which you stored the files for the released product in step 3.

You can now use this location as an installation point, or you can create an image of this source that you can burn to a CD-ROM.

7. To install the language template pack with the software update already applied, run Setup from this location and then run the SharePoint Products and Technologies Configuration Wizard to complete the configuration.

## **Updated guidance for maintaining system performance**

Following the guidance below may help you improve your ongoing system performance.

### ***Recommended practices to improve front-end Web server performance***

The following guidance may help you improve front-end Web server performance.

## Monitor SQL Server performance

We have found that it is best to monitor performance and capacity from the bottom of the stack to the top, because stress on the server running SQL Server is likely to cause stress on front-end Web servers. For example, if the server running SQL Server is taking significantly more time to respond to a request from a front-end Web server, and if the front-end Web server is receiving requests from end users at the normal rate, requests on the front-end Web server start queuing up, eventually pushing it over its limits. See the section [SQL Server recommended practices](#).

For Search, it is extremely important to monitor SQL Server index fragmentation, and follow the SQL Server defragmentation guidelines for SharePoint Products and Technologies provided in the Knowledge Base article [How to defragment Windows SharePoint Services 3.0 databases and SharePoint Server 2007 databases](#)

(<http://go.microsoft.com/fwlink/?LinkID=105588&clcid=0x409>). We have seen significantly improved Search times in systems that follow this practice.

## Apply the ASP.NET # Induced GC counter hotfix

When you run a Microsoft ASP.NET 2.0 Web application that is built on the .Microsoft NET Framework 2.0, such as SharePoint Products and Technologies, the value of the # Induced GC performance counter increases very quickly. Additionally, CPU usage becomes high, and the computer performance decreases. To fix this issue, apply the hotfix available in this Knowledge base article, [FIX: The # Induced GC performance counter value increases quickly and CPU usage becomes high when you run an ASP.NET 2.0 Web application that is built on the .NET Framework 2.0](#) (<http://go.microsoft.com/fwlink/?LinkId=105921&clcid=0x409>).

## Monitor and manage 32-bit worker process recycling

By default, 2GB of virtual address space is allocated for each 32-bit Windows user mode process. A certain amount of this address space must remain unused for dynamic allocations. Additionally, some operations in Office SharePoint Server require large blocks of contiguous address space to perform dynamic allocations. The longer a process runs, the more fragmented the address space becomes. Because of this, when the size of the Office SharePoint Server worker process exceeds 1.2 GB to 1.4 GB, the process will begin to experience out of memory errors and other anomalous events. As the process continues to consume address space the errors will get worse, eventually resulting in termination by IIS.

**Important:** In a 64-bit environment, the default values for process recycling when running are generally sufficient; we do not recommend that you change them.

To address this issue, we recommend that you set up the following processes on each 32-bit front-end Web server.

- **Use IIS overlapped recycling**

Regularly restarting the worker process can help reduce the fragmentation in the address space making the process more robust and efficient. The overlapped recycling feature in IIS can be used to recycle the SharePoint worker process gracefully, allowing existing user requests time to complete. Prior to stopping and restarting the existing process, a new process is spawned that takes all new requests. The old process is shut down when all existing requests have been met or the shut down time limit has been exceeded.

For best results you should set IIS to recycle at specific times, and when memory usage reaches specific levels.

- Configure a virtual memory-based recycle to occur 1700 MB.
- Configure the memory used recycle to occur at 1000 MB.

- Set the shutdown time limit to at least 300 seconds to allow long running user requests, such as large file uploads, an opportunity to complete.
- Use time-based recycles in environments with regular heavy loads at certain periods of the day. Set a scheduled recycle about 30 minutes before the peak traffic starts.

Failure to configure these settings on 32-bit servers may have an adverse affect on ASP.NET cache management. If you do not set a process memory limit, ASP.NET will calculate one for you. If the user mode address space is 2 GB, ASP.NET will use the lesser value of either 60% physical RAM or 800 MB. This value will be used to determine how aggressively the cache should clean up memory. Setting this value too low results in spending too much time cleaning up memory. Setting it too high allows the process to grow too large and cause OutOfMemory Exceptions and other errors.

For more information about recycling worker processes, see [Configuring Worker Processes for Recycling](http://go.microsoft.com/fwlink/?LinkId=105924&clcid=0x409) (http://go.microsoft.com/fwlink/?LinkId=105924&clcid=0x409).

- **Enable the LogEventOnRecycle IIS metabase setting to track process recycling**

You can use the LogEventOnRecycle property in the Internet Information Services (IIS) 6.0 metabase to generate entries in the system event log to track how often worker processes are recycling. If you find that the processes for SharePoint Products and Technologies are recycling more frequently than every 4 hours, consider adding more front-end Web servers to handle to the load.

You can set the flags by using Adsutil.vbs. To write the causes of all application pool processes to the event log, follow these steps:

1. Click **Start**, click **Run**, and then type **cmd** at the command prompt.
2. Change to the directory where **Adsutil** is located. The following is the default directory location: %SYSTEMROOT%\inetpub\AdminScripts
3. Type the following command:

```
cscript adsutil.vbs Set w3svc/AppPools/  
[YourAppPoolName] /LogEventOnRecycle 255
```

In the command above, replace [YourAppPoolName] with the actual name of the application pool upon which you want to enable the events.



#### **Note**

If your application pool name has a space in it, for example, "SharePoint- 80", you must include double quotes around the metabase path in the command.

```
cscript adsutil.vbs Set "w3svc/AppPools/SharePoint -  
80/LogEventOnRecycle" 255
```

For more information, see [How to modify Application Pool Recycling events in IIS 6.0](http://go.microsoft.com/fwlink/?LinkId=105925&clcid=0x409) (http://go.microsoft.com/fwlink/?LinkId=105925&clcid=0x409).

## **Perform maintenance during off-peak hours**

Moving or deleting a site while other sites are in use can make an entire portal unresponsive.

## Don't leave pages checked out

If you are using Enterprise Content Management, don't leave pages checked out--check them in quickly after every change. Leaving pages checked out slows page rendering down by a second or two.

## Carefully monitor your use of customizations and Web parts

Only deploy customizations that follow the best practices described in the following papers:

- [Best Practices: Using Disposable Windows SharePoint Services Objects](http://go.microsoft.com/fwlink/?LinkId=105945&clcid=0x409)  
(<http://go.microsoft.com/fwlink/?LinkId=105945&clcid=0x409>)
- [Development Tools and Techniques for Working with Code in Windows SharePoint Services 3.0 \(Part 1 of 2\)](http://go.microsoft.com/fwlink/?LinkId=101494&clcid=0x409)  
(<http://go.microsoft.com/fwlink/?LinkId=101494&clcid=0x409>)
- [Best Practices: Common Coding Issues When Using the SharePoint Object Model](http://go.microsoft.com/fwlink/?LinkId=105946&clcid=0x409)  
(<http://go.microsoft.com/fwlink/?LinkId=105946&clcid=0x409>)
- [SharePoint Products and Technologies customization policy](http://go.microsoft.com/fwlink/?LinkId=105947&clcid=0x409)  
(<http://go.microsoft.com/fwlink/?LinkId=105947&clcid=0x409>)

Also, monitor Web Parts and page rendering times. The Colleagues Web Part can be processing intensive. Do not use it on pages that render a lot of other information.

## Monitor and manage large files

A large file is a file bigger than 5 MB.

- While handling very large files, change the maximum upload size for documents to be the size of the largest expected file for your business needs. The default maximum upload size for files is 50 MB. The maximum file size supported by SharePoint Products and Technologies is 2 GB.
- If there is a collection of large files that your users often access, and if these files are updated infrequently, we recommend that you store them outside of SharePoint, and consider using an offline collaboration client.

## Train your users to work with large files

The way that your users work with large files can have a significant impact on performance.

- All users should have at least 50 MB allocated for temporary internet files (the Internet Explorer cache), and should allocate more space if they regularly open large files. Users that do not have space allocated for temporary internet files generate significant load on front-end Web servers.
- Users that work with or read extremely large documents (larger than 25 MB) should save them to their local computer. Opening large documents directly from a document library consumes bandwidth and resources while the document is open, and may automatically save changes directly to the document in the document library.
  - Users should right-click the document and save it to their computer before opening the document, and then upload any changes to the document library when they have completed their edits.
- Users should not use Explorer view to view large documents--they should use the All Documents view instead. When you open a SharePoint document library in Explorer view, placing your cursor over any of the enumerated files will request metadata for all of the files in the folder you are browsing, and in some cases, may request the entire file. This can result in

extremely high load on the server if many large files are simultaneously browsed in Explorer view.

- Users should not use the **Download a Copy** item on the **Send To** submenu on the **Edit** menu in your document libraries. The **Download a Copy** option opens the full file in the memory of the front-end Web server.

## Manage your large lists for performance

SharePoint Products and Technologies support large lists, but you must carefully control how users view the lists to prevent performance impacts.

- For best performance, do not go over 2,000 items in a list level (for example, the root of the list or a single folder).
- If you must create and browse large lists, follow these best practices:
  - Index the list on one or more columns.
  - Change the default view of your list to a customized filtered view that follows these recommendations:
    - The view returns fewer than 5,000 items.
    - The first column that you use to filter the view has an index and that it sufficiently reduces the total number of items returned.
    - The view displays only those columns that are absolutely required.
    - The view includes as few lookup columns as possible. Each lookup column in a list that is included in a view causes an additional join, and additional calls to the database,
- Evaluate list size in terms of the number of columns in a list. Very wide lists can perform slowly.

Be aware that the following settings and operations can significantly impact the performance of a site with large lists.

- Fine-grained permissions (permissions on the list or library, folder, or item or document level) force authorization checking on each item.
- Changing authorization settings.
- Creating, updating, and deleting indexes.
- Importing and exporting content.
- Deleting a list.
- Deploying new content types or updating existing content types.

If you have workflows that generate a lot of task and history items, you may be creating large lists. For very active workflows, follow these practices:

- Keep the AutoCleanupDays timer job running to clean up tasks on completed workflows older than 60 days.
- When you create workflow associations, if you anticipate that a workflow will be heavily used or will create a lot of task and history items, use non-default task and history lists.

Be aware that if you have a site with large lists, it can slow the performance of site collection backups performed with the Stsadm backup operations.

If you plan to, or currently have very large lists, we strongly recommend that you read the following resources:

- [Manage lists and libraries with many items](http://go.microsoft.com/fwlink/?LinkID=105579&clcid=0x409)  
(http://go.microsoft.com/fwlink/?LinkID=105579&clcid=0x409)
- [Working with large Lists in Office SharePoint Server 2007](http://go.microsoft.com/fwlink/?LinkID=105580&clcid=0x409)  
(http://go.microsoft.com/fwlink/?LinkID=105580&clcid=0x409)

## Train your users to work with large document libraries

The way that your users work with large files can have a significant impact on performance.

- Users should use customized view filters that have been indexed to work with large document libraries, and not access the libraries directly.
- Encourage users not to use Explorer view to view large document libraries--they should use the All Documents view instead. When you open a SharePoint document library in Explorer view, placing your cursor over any of the enumerated files requests metadata for all of the files in the folder you are browsing, and in some cases, may request the entire file. In folders that contain a large number of items, this process can take a long time and may impact the performance of the server farm.
- Work with users to create appropriate views for their needs, and discourage them from creating their own views for large lists. If you have a Web application that contains many large lists, you may want to consider disabling the permission **Manage Personal Views - Create, change, and delete personal views of lists** for the Web application as a whole.

## Disk recommended practices

The following practices may help your system performance.

- In respect to growth potential and peak usage patterns, maintain a level of at least 25% free space across disks to allow for growth. If you are managing growth by adding disks to a RAID array or allocating more storage, monitor disk size closely to avoid running out of space.
- In cases in which the disk controller uses Disk Write Cache, make sure that the controller is backed-up by a battery in the event of power failure.

## SQL Server recommended practices

The following practices may help your SQL Server performance.

- Proactively check the integrity of your databases by running DBCC CHECKDB ('<DB Name>') on a routine basis.
- Monitor SQL Server index fragmentation, and follow the SQL Server defragmentation guidelines for SharePoint Products and Technologies provided in the Knowledge Base article [How to defragment Windows SharePoint Services 3.0 databases and SharePoint Server 2007 databases](http://go.microsoft.com/fwlink/?LinkID=105588&clcid=0x409) (http://go.microsoft.com/fwlink/?LinkID=105588&clcid=0x409).
- Do not perform unsupported operations on the server running SQL Server. For details about operations that are not supported, see the Knowledge Base article [Support for changes to the databases that are used by Office server products and by Windows SharePoint Services](http://go.microsoft.com/fwlink/?LinkID=105589&clcid=0x409) (http://go.microsoft.com/fwlink/?LinkID=105589&clcid=0x409).

## Updated guidance for monitoring

The following sections list the performance counters that we recommend you monitor, and approximate healthy values for each counter.

For details about how to monitor performance and use performance counters, see [Monitoring Performance](http://go.microsoft.com/fwlink/?LinkID=105584&clcid=0x409) (http://go.microsoft.com/fwlink/?LinkID=105584&clcid=0x409).

## Physical Servers

Monitor the following counters to ensure the health of your servers.

- *Processor: % Processor Time: \_Total*. On the computer running SQL Server, this counter should be kept between 50%-75%. In case of constant overloading, investigate whether there is abnormal process activity or if the server needs additional CPU.
- *System: Processor Queue Length: (N/A)*. Monitor this counter to ensure that it remains below two times the number of Core CPUs.
- *Memory: Available Mbytes: (N/A)*. Monitor this counter to ensure that you maintain a level of at least 20% of the total physical RAM free.
- *Memory: Pages/sec: (N/A)*. Monitor this counter to ensure that it remains below 100.

For more information and memory troubleshooting methods, see: [SQL Server 2005 Monitoring Memory Usage](http://go.microsoft.com/fwlink/?LinkID=105585&clcid=0x409) (http://go.microsoft.com/fwlink/?LinkID=105585&clcid=0x409).

## Disk counters to monitor

Monitor the following counters to ensure the health of your disks. Note that the values below represent values measured over period of time, not for a sudden spike or based on single measurement.

- Before deploying a new farm, it is recommended that you benchmark the I/O subsystem, using the SQLIO disk subsystem benchmark tool. For details, see [SQLIO Disk Subsystem Benchmark Tool](http://go.microsoft.com/fwlink/?LinkID=105586&clcid=0x409) (http://go.microsoft.com/fwlink/?LinkID=105586&clcid=0x409)
- *Logical Disk: Disk Transfers/sec*. This counter provides the overall throughput on the specific disk. Use this counter to monitor growth trends and forecast appropriately.
- *Logical Disk: Disk Read Bytes/sec & Disk Write Bytes/sec*. This counter provides a measure of the total bandwidth for a particular disk.
- *Logical Disk: Average Disk sec/Read (Read Latency)*. This counter indicates the time it takes the disk to retrieve data. On well-tuned I/O subsystems, ideal values are 1-5 ms for logs (ideally 1 ms on a cached array), and 4-20 ms for data (ideally below 10 ms). Higher latencies can occur in peak times, but if high values are occurring regularly, investigate the cause.
- *Logical Disk: Average Disk sec/Write (Write Latency)*. This counter indicates the time it takes the disk to write the data. On well-tuned I/O subsystems, ideal values would be 1-5 ms for log (ideally 1ms on a cached array), and 4-20 ms for data (ideally below 10ms). Higher latencies can occur in peak times, but if high values are systematically occurring, investigate the cause.
- *Logical Disk: Average Disk Byte/Read*. This counter indicates the size of I/Os being read. This value may impact disk latency and larger I/Os may result in slightly higher latency. When used to monitor SQL Server, this will tell you the average size of the I/Os SQL Server is issuing.
- *Logical Disk: Average Disk Byte/Write*. This counter indicates the size of I/Os being written. This value may impact disk latency and larger I/Os may result in slightly higher latency. When used to monitor SQL Server, this will tell you the average size of the I/Os SQL Server is issuing.

- *PhysicalDisk: % Disk Time: DataDrive*. Monitor this counter to ensure that it remains below two times the number of disks.
- *Logical Disk: Current Disk Queue Length*. For this counter, lower values are better. Values above 20 may indicate a bottleneck in the request waiting to be served by the disk, and should be investigated. Bottlenecks can create a backlog that may spread beyond the current server accessing the disk and result in long wait times for end users. Possible solutions to a bottleneck may be to add more disks to the RAID array, replace with faster disks, or move some of the data to other disks.
- *Logical Disk: Average Disk Queue Length*. This counter indicates the average number of outstanding I/O requests. The general rule of thumb is you should be at 2 or fewer outstanding I/O requests per spindle but this may be hard to measure due to storage virtualization, differences in RAID levels between configurations, and so on. Look for higher than average disk queue lengths in combination with higher than average disk latencies. This combination could indicate that the storage array cache is being over-utilized or that spindle sharing with other applications is impacting performance.
- *Logical Disk: Average Disk Reads/Sec* and *Logical Disk: Average Disk Write/Sec*. These counters indicate the rate of read and write operations on the disk. Monitor these counters to ensure that they remain below 85 percent of the disk capacity. Disk access time increases exponentially if reads or writes are above 85 percent of disk capacity. To determine the specific I/O capacity for your hardware, refer to the vendor documentation, or use the SQLIO disk subsystem benchmark tool to calculate it. For more information, see [SQLIO Disk Subsystem Benchmark Tool](http://go.microsoft.com/fwlink/?LinkID=105586&clcid=0x409) (<http://go.microsoft.com/fwlink/?LinkID=105586&clcid=0x409>).
- When using RAID configurations with the *Logical Disk: Average Disk Reads/Sec* or *Logical Disk: Average Disk Write/Sec* counters, use the following formulas to determine the rate of I/Os on the disk.

RAID level	Formula
RAID 0	I/Os per disk = (reads + writes) / number of disks
RAID 1	I/Os per disk = [reads + (2 * writes)] / 2
RAID 5	I/Os per disk = [reads + (4 * writes)] / number of disks
RAID 10	I/Os per disk = [reads + (2 * writes)] / number of disks

For example, if you have a RAID 1 system with two physical disks, and your counters are at the following values:

Counter	Value
Average Disk Reads/Sec	80
Average Disk Write/Sec	70
Average Disk Queue Length	5

The I/O value per disk can be calculated as:

$$(80 + (2 * 70))/2 = 110$$

The disk queue length can be calculated:

$$5/2 = 2.5$$

In this situation, you have a borderline I/O bottleneck.

- Monitor disk latency and analyze trends. The amount of I/O and latency specific to SQL Server data files can be found by using the `sys.dm_io_virtual_file_stats` dynamic management view in SQL Server 2005. For more information, see [sys.dm\\_io\\_virtual\\_file\\_stats](http://go.microsoft.com/fwlink/?LinkID=105587&clcid=0x409) (<http://go.microsoft.com/fwlink/?LinkID=105587&clcid=0x409>).

## Known issues and troubleshooting

### ***Deployment known issues***

This section describes common errors you might encounter and what you need to do to fix them.

#### **Error: Failed to upgrade SharePoint Products and Technologies**

If you add a new Web server to an existing server farm that does not have any Web applications, and you update the Web server and then run the SharePoint Products and Technologies Configuration Wizard, you might receive the following error message:

An exception of type

`Microsoft.SharePoint.PostSetupConfiguration.PostSetupConfigurationTaskException` was thrown. Additional exception information: Failed to upgrade SharePoint Products and Technologies.

This error occurs when the SharePoint Products and Technologies Configuration Wizard cannot locate or modify the `Web.config` file.

To resolve the issue, you must manually copy the `Web.config` file from `%COMMONPROGRAMFILES%\Microsoft Shared\web server extensions\12\Config to %COMMONPROGRAMFILES%\Microsoft Shared\web server extensions\12\Template\Layouts`. After the `Web.config` file is in the `Layouts` folder, you can run the SharePoint Products and Technologies Configuration Wizard again.

#### **Error: Failed to start the Office SharePoint Server Search service**

If the Office SharePoint Server Search service does not automatically start during the update, the following message in the SharePoint Products and Technologies Configuration Wizard appears:

Failed to start service `SearchServiceInstance` on this server after completing upgrade. Please start it manually.

The SharePoint Products and Technologies Configuration Wizard finishes successfully but the Office SharePoint Server Search service remains stopped.

#### **► To start the Office SharePoint Server Search service**

1. Open a Command Prompt window and change to the following folder:  
`%COMMONPROGRAMFILES%\Microsoft Shared\web server extensions\12\BIN`
2. Run the following command:  
**`stsadm -o osearch -action start`**

## **Foxit PDF IFilter must be reinstalled after installing software update**

If you installed the Foxit PDF IFilter on your search server, the IFilter does not work after you install a software update. You must reinstall the IFilter.

## **Setup stops responding when you use an alternate location for the Updates folder**

When you are using the Updates folder and specify an alternate location for the Updates folder by modifying the SUpdateLocation parameter in the config.xml file Setup will stop responding and a error dialog box will appear.

This is a known limitation in the product. If you want to use the Updates folder, you must use the default location for the SUpdateLocation parameter.

## **Error: The search request is unable to connect to the search service**

After you install Service Pack 1 (SP1), more disk space is required for your query server or index server. If adequate disk space is not available, your query servers will slow down or stop. Queries that normally take less than 5 seconds will be very slow, return an error, or timeout, and you will see the service error **The search request is unable to connect to the search service**.

This issue occurs because the method used to merge indexes has been modified to significantly improve performance and reduce server downtime. However, this change increases the disk space required to perform a master merge. Previously, a maximum of 2 times the physical size of the index was required. The new maximum disk space requirement on a query server or index server is increased to 2.85 times the physical size of the index.

## **Language Template Pack version is not correct in Add or Remove Programs**

You cannot determine if the Office SharePoint Server 2007 Service Pack 1 Language Template Pack is installed by examining the Language Template Pack entry in Add or Remove Programs. This is because the Office SharePoint Server 2007 Service Pack 1 Language Template Pack installation does not update the existing entry.

### **Note**

This issue does not apply to Windows SharePoint Services 3.0 Service Pack 1 Language Template Packs.

To determine which version of the Office SharePoint Server 2007 Language Template Pack is installed, verify that the value for the **DisplayVersion** key contains the build and version for the Office SharePoint Server 2007 Service Pack 1 Language Template Pack. Open the following key in a registry editor:

**\HKLM\Software\Microsoft\Windows\CurrentVersion\Uninstall\<product>\ DisplayVersion\**

## **Content Editor Web Part script error**

If you are using the Content Editor Web Part on a Office SharePoint Server 2007 Web server, which offers languages other than the installed language, users will receive a script error when they use the Web Part.

You can prevent this issue from occurring on your Office SharePoint Server 2007 Web servers by installing the Windows SharePoint Services 3.0 Service Pack 1 Language Template Pack before you install the Office SharePoint Server 2007 Service Pack 1 Language Template Pack.

If you already installed the Office SharePoint Server 2007 Service Pack 1 Language Template Pack without the Windows SharePoint Services 3.0 Service Pack 1 Language Template Pack and your users are experiencing the script error, you can resolve this problem by installing the Windows SharePoint Services 3.0 Service Pack 1 Language Template Pack on the affected Office SharePoint Server 2007 Web servers.

## ***Performance troubleshooting***

### **If a disk or RAID experiences a bottleneck**

4. Relocate some of the files to a separate disk or RAID array.
5. Add disks to the array.
6. If you cannot separate the content, for instance in the case of a single content database file, replace the disks with faster ones.
7. Where possible, split the relevant Content Database into several databases (relocate, or split and relocate Site Collections using tools such as the Stsadm.exe command line tool or Microsoft Office SharePoint Designer). If the problem persists, repeat the troubleshooting steps from Step 1.