Remote BLOB storage for
Microsoft SharePoint Foundation 2010

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Abstract

This book describes how to use Microsoft SharePoint Foundation 2010 together with Remote BLOB Storage (RBS) and Microsoft SQL Server 2008 Express and Microsoft SQL Server 2008 R2 Express to optimize database storage resources.

The content in this book is a copy of selected content in the SharePoint Foundation 2010 technical library (*http://go.microsoft.com/fwlink/?LinkId=181463*) as of the publication date. For the most current content, see the technical library on the Web.

Microsoft

Contents

Getting help

Every effort has been made to ensure the accuracy of this book. This content is also available online in the Office System TechNet Library, so if you run into problems you can check for updates at:

http://technet.microsoft.com/office

If you do not find your answer in our online content, you can send an e-mail message to the Microsoft Office System and Servers content team at:

itspdocs@microsoft.com

If your question is about Microsoft Office products, and not about the content of this book, please search the Microsoft Help and Support Center or the Microsoft Knowledge Base at:

http://support.microsoft.com

Overview of RBS (SharePoint Foundation 2010)

Published: May 12, 2010

This article describes how you can use Microsoft SharePoint Foundation 2010 together with Remote BLOB Storage (RBS) and Microsoft SQL Server 2008 Express and Microsoft SQL Server 2008 R2 Express to optimize database storage resources.

Before you implement RBS, we highly recommend that you evaluate its potential costs and benefits. For more information and recommendations about using RBS in a SharePoint Foundation 2010 installation, see Plan for RBS (SharePoint Foundation 2010).

In this article:

- Introduction to RBS
- Using RBS together with SharePoint 2010 Products

Introduction to RBS

RBS is a library API set that is incorporated as an add-on feature pack for Microsoft SQL Server. It can be run on the local server running Microsoft SQL Server 2008 R2, SQL Server 2008 or SQL Server 2008 R2 Express. To run RBS on a remote server, you must be running SQL Server 2008 R2 Enterprise edition. RBS is not supported for Microsoft SQL Server 2005.

Binary large objects (BLOBs) are data elements that have either of the following characteristics:

- Unstructured data that has no schema (such as a piece of encrypted data).
- A large amount of binary data (many megabytes or gigabytes) that has a very simple schema, such as image files, streaming video, or sound clips.

By default, SQL Server stores BLOB data in its databases. As a database's usage increases, the total size of its BLOB data can expand quickly and grow larger than the total size of the document metadata and other structured data that is stored in the database. Because BLOB data can consume a lot of file space and uses server resources that are optimized for database access patterns, it can be helpful to move BLOB data out of the SQL Server database, and into a separate file.

Before RBS was supported in SQL Server, expensive storage such as RAID 10 was required for the whole SQL database including BLOB data. By using RBS, you can move 80 to 90 percent of the data (that is, BLOBs) onto less expensive storage such as RAID 5 or external storage solutions.

RBS uses a *provider* to connect to any dedicated BLOB store that uses the RBS APIs. Storage solution vendors can implement providers that work with RBS APIs. SharePoint Foundation 2010 supports a BLOB storage implementation that accesses BLOB data by using the RBS APIs through such a provider. You can implement RBS for Microsoft SharePoint 2010 Products by using a supported provider that you obtain from a third-party vendor. Most third-party providers store BLOBs remotely.

In addition to third-party providers, you can use the RBS FILESTREAM provider that is available through the SQL Server Remote BLOB Store installation package from the Feature Pack for Microsoft SQL Server 2008 R2. The RBS FILESTREAM provider uses the SQL Server FILESTREAM feature to store BLOBs in an additional resource that is attached to the same database and stored locally on the server. The FILESTREAM feature manages BLOBs in a SQL database by using the underlying NTFS file system.

The location that an RBS provider stores the BLOB data depends on the provider that you use. In the case of the SQL FILESTREAM provider, the data is not stored in the MDF file, but in another file that is associated with the database.

This implementation of the FILESTREAM provider is known as the *local FILESTREAM provider*. You can conserve resources by using the local RBS FILESTREAM provider to place the extracted BLOB data on a different (cheaper) local disk such as RAID 5 instead of RAID 10. You cannot use RBS with the local FILESTREAM provider on remote storage devices, such as network attached storage (NAS). The FILESTREAM provider is supported when it is used on local hard disk drives only.

A remote RBS FILESTREAM provider that is available in SQL Server 2008 R2 Express can store BLOB data on remote commodity storage such as direct-attached storage (DAS) or NAS. However, SharePoint Foundation 2010 does not currently support the remote RBS FILESTREAM provider.

Using RBS together with SharePoint 2010 Products

SharePoint Foundation 2010 supports the FILESTREAM provider that is included in the SQL Server Remote BLOB Store installation package from the Feature Pack for SQL Server 2008 R2. This version of RBS is available at
http://go.microsoft.com/fwlink/?LinkID=177388
(*http://go.microsoft.com/fwlink/?LinkID=177388*). Be aware that this is the only version of RBS that is supported by SharePoint Foundation 2010. Earlier versions are not supported. Third-party RBS providers can also be used with the RBS APIs to create a BLOB storage solution that is compatible with SharePoint Foundation 2010.

In SharePoint Foundation 2010, site collection backup and restore and site import or export will download the file contents and upload them back to the server regardless of which RBS provider is being used. However, the FILESTREAM provider is the only

provider that is currently supported for SharePoint 2010 Products farm database backup and restore operations.

When RBS is implemented, SQL Server itself is regarded as an RBS provider. You will encounter this factor when you migrate content into and out of RBS.

If you plan to store BLOB data in an RBS store that differs from your SharePoint Foundation 2010 content databases, you must run SQL Server 2008 with SP1 and Cumulative Update 2. This is true for all RBS providers.

The FILESTREAM provider that is recommended for upgrading from stand-alone installations of Windows SharePoint Services 3.0 that have content databases that are over 4 gigabytes (GB) to SharePoint Foundation 2010 associates data locally with the current content database, and does not require SQL Server Enterprise Edition.

⬥ **Important:**

RBS does not enable any kind of direct access to any files that are stored in Microsoft SharePoint 2010 Products. All access must occur by using SharePoint 2010 Products only.

In a stand-alone installation of Windows SharePoint Services 3.0, content databases are stored in Windows Internal Database and have no size limitations. Conversely, in SharePoint Foundation 2010, the content databases are stored in SQL Server 2008 Express and have a maximum size of 4 GB per database.

SQL Server 2008 R2 Express supports databases that are as large as 10 GB. If your installation includes databases that are larger than 4 GB but smaller than 10 GB, we recommend that you upgrade to SQL Server 2008 R2 Express for your content database storage solution. SQL Server 2008 R2 Express is a free upgrade that you can download and install from http://go.microsoft.com/fwlink/?LinkID=177388 (*http://go.microsoft.com/fwlink/?LinkID=177388*).

If you are upgrading from Windows SharePoint Services 3.0 and have content databases that are 10 GB or larger, you must implement RBS. Or, you can use a standard or enterprise edition of Microsoft SQL Server 2008 or .

For additional guidance about how to upgrade from Windows SharePoint Services 3.0 to SharePoint Foundation 2010 together with RBS, see Upgrading from a stand-alone installation of Windows SharePoint Services 3.0 to SharePoint Foundation 2010 when content databases exceed 4 GB (RBS).

Other Resources

FILESTREAM Overview (*http://go.microsoft.com/fwlink/?LinkID=166020&clcid=0x409*)
FILESTREAM Storage in SQL Server 2008
(*http://go.microsoft.com/fwlink/?LinkID=165746&clcid=0x409*)
Remote BLOB Store Provider Library Implementation Specification
(*http://go.microsoft.com/fwlink/?LinkID=166066&clcid=0x409*)

Plan for RBS (SharePoint Foundation 2010)

Updated: July 8, 2010

By default, Microsoft SQL Server stores binary large object (BLOB) data in its databases. As a database's usage increases, the total size of the BLOB data that is stored in it can expand quickly and grow larger than the total size of the document metadata and other structured data that is stored in the database. BLOB data consumes large amounts of file space and uses server resources that are optimized for database access patterns instead of for the storage of large files.

Remote BLOB Storage (RBS) is a library API set that is incorporated as an add-on feature pack for Microsoft SQL Server. It can be run on the local server running Microsoft SQL Server 2008 R2, SQL Server 2008 or SQL Server 2008 R2 Express. To run RBS on a remote server, you must be running SQL Server 2008 R2 Enterprise edition. RBS is designed to move the storage of BLOBs from database servers to commodity storage solutions. RBS saves significant space, conserves expensive server resources, and provides a standardized model for applications to access BLOB data. In Microsoft SharePoint Foundation 2010, RBS can be used for content databases only.

For more background information about RBS, including a discussion about the FILESTREAM provider, see [Overview of RBS (SharePoint Foundation 2010)](#).

RBS can provide the following benefits:

- BLOB data can be stored on less expensive storage devices that are configured to handle simple storage.
- The administration of the BLOB storage is controlled by a system that is designed specifically to work with BLOB data.
- Database server resources are freed for database operations.

These benefits are not free. Before you implement RBS with SharePoint Foundation 2010, you should evaluate whether these potential benefits override the costs and limitations of implementing and maintaining RBS. This article describes this evaluation process.

In this article:

- [Review the environment](#)
- [Evaluate provider options](#)

Review the environment

To start your analysis of RBS, review the size of the content databases. If the content database sizes meet the criteria for a RBS recommendation, you should then consider what kind of content is being accessed and how it is being used.

Content database sizes

You can expect to benefit from RBS in the following cases:

- The content databases are larger than 500 gigabytes (GB).

- The BLOB data files are larger than 256 kilobytes (KB).

- The BLOB data files are at least 80 KB and the database server is a performance bottleneck. In this case, RBS reduces the both the I/O and processing load on the database server.

Although the presence of many small BLOBs can create some decrease in performance, the cost of storage is usually the most important consideration when you evaluate RBS. The predicted decrease in performance is usually an acceptable trade-off for the cost savings in storage hardware.

In the case of SharePoint Foundation 2010, consider implementing RBS if you want to remain on a free version of Microsoft SQL Server, and you estimate that the databases will be larger than 4 GB. If you do not expect that the content databases will grow to 4 GB, we do not recommend that you implement RBS.

Note:

If you are upgrading from Windows SharePoint Services 3.0 to SharePoint Foundation 2010, you should read Upgrading from a stand-alone installation of Windows SharePoint Services 3.0 to SharePoint Foundation 2010 when content databases exceed 4 GB (RBS) for additional upgrade advice.

By default, Microsoft SharePoint Foundation 2010 is installed together with Microsoft SQL Server 2008 Express. SQL Server 2008 Express has a 4 GB size limit for any database. You can immediately extend the supported size of the content databases by installing Microsoft SQL Server 2008 R2 Express, which supports databases up to 10 GB. SQL Server 2008 R2 Express is a free download that is available at http://go.microsoft.com/fwlink/?LinkID=189418
(*http://go.microsoft.com/fwlink/?LinkID=189418*).

The remainder of this section assumes that you will install SQL Server 2008 R2 Express to support SharePoint Foundation 2010 databases. In this case, if you expect that the content databases will be 10 GB or larger, consider the following options:

- If the content databases will be up to 16 GB and you do not expect that they contain more than 10 GB of metadata, you should implement RBS. In this case, RBS lets you continue to use a free version of SQL Server. In making this recommendation, we assume that when you migrate a 16 GB content database to RBS, the metadata does not exceed 10 GB.

- If the content databases are larger than 16 GB, you must purchase Microsoft SQL Server 2008 R2, SQL Server 2008 with Service Pack 1 (SP1) and Cumulative Update 2, or SQL Server 2005 with SP3 and Cumulative Update 3 to support the databases instead of remaining on a free version of SQL Server.

Content type and usage

RBS is most beneficial in systems that store very large files, such as digital media. RBS is typically implemented in environments in which large stored files are infrequently accessed, such as an archive. If this situation describes your environment, you should consider implementing RBS.

If you are storing many small (less than 256 KB) files that are frequently accessed by many users, you might experience increased latency on sites that have many small files that are stored in RBS. Increased latency is one cost factor that you should consider when you evaluate RBS for your storage solution. However, it is unlikely to be the strongest consideration. The amount of increased latency is also related to the RBS provider that you use.

Evaluate provider options

RBS requires a provider that connects the RBS APIs and SQL Server. Microsoft SQL Server 2008 Express and Microsoft SQL Server 2008 R2 Express include the FILESTREAM provider.

⬥ **Important:**

RBS can be run on the local server running Microsoft SQL Server 2008 R2, SQL Server 2008 or SQL Server 2008 R2 Express. To run RBS on a remote server, you must be running SQL Server 2008 R2 Enterprise edition. SharePoint Foundation 2010 requires you to use the version of RBS that is included with the SQL Server Remote BLOB Store installation package from the Feature Pack for Microsoft SQL Server 2008 R2. Earlier versions of RBS will not work with SharePoint Foundation 2010. In addition, RBS is not supported in SQL Server 2005.

BLOBs can be kept on commodity storage such as direct-attached storage (DAS) or network attached storage (NAS), as supported by the provider. The FILESTREAM provider is supported by SharePoint Foundation 2010 when it is used on local hard disk drives only. You cannot use RBS with FILESTREAM on remote storage devices, such as NAS.

The following table summarizes FILESTREAM benefits and limitations.

Operational requirement	RBS with FILESTREAM	RBS without FILESTREAM
SQL Server integrated backup and recovery of the BLOB Store	Yes	Yes

Operational requirement	RBS with FILESTREAM	RBS without FILESTREAM
Scripted migration to BLOBs	Yes	Yes
Supports mirroring	No	No
Log shipping	Yes	Yes, with provider implementation
Database snapshots	No1	No1
Geo replication	Yes	No
Encryption	NTFS only	No
Network Attached Storage (NAS)	Not supported by SharePoint 2010 Products	Yes, with provider implementation

1If the RBS provider that you are using does not support snapshots, you cannot use snapshots for content deployment or backup. For example, the SQL FILESTREAM provider does not support snapshots.

If FILESTREAM is not a practical provider for your environment, you can purchase a supported third-party provider. In this case, you should evaluate the following criteria when shopping for a provider:

- Backup and restore capability
- Tested disaster recovery
- Deployment and data migration
- Performance impact
- Long-term administrative costs

 Important:
We do not recommend that you develop your own provider unless you are an independent software vendor (ISV) that has significant development experience in designing storage solutions.

Install and configure RBS with the FILESTREAM provider (SharePoint Foundation 2010)

Published: May 12, 2010

This article describes how to install and configure Remote BLOB Storage (RBS) with the FILESTREAM provider on a Microsoft SQL Server 2008 database server that supports a Microsoft SharePoint Foundation 2010 system. RBS is typically recommended in the case where the content databases are 4 gigabytes (GB) or larger.

In SharePoint Foundation 2010, the content databases are stored in Microsoft SQL Server 2008 Express and have a maximum size of 4 GB per database. Because Microsoft SQL Server 2008 R2 Express supports content databases that are up to 10 GB, we recommend that you install SQL Server 2008 R2 Express to support the content databases. For more information, see Microsoft SQL Server 2008 R2 Express Edition (*http://go.microsoft.com/fwlink/?LinkID=189418*).

RBS is a library API set that is incorporated as an add-on feature pack for Microsoft SQL Server 2008 and Microsoft SQL Server 2008 Express. RBS is designed to move the storage of binary large objects (BLOBs) from database servers to commodity storage solutions. RBS ships with the RBS FILESTREAM provider, which uses the RBS APIs to store BLOBs. Before installing and implementing RBS, we highly recommend that you read the articles Plan for RBS (SharePoint Foundation 2010) and Overview of RBS (SharePoint Foundation 2010).

If you want to implement RBS with a provider other than FILESTREAM, read the article Install and configure RBS without the FILESTREAM provider (SharePoint Foundation 2010).

In this article:

- Enable FILESTREAM and provision the RBS data store
- Install RBS
- Enable and test RBS

The user account that you use to perform the procedures that are described in this article must have the following memberships:

- Administrators group on the Web servers and application servers.
- Farm Administrators group for the SharePoint Foundation 2010 farm.
- SQL Server **dbcreator** and **securityadmin** fixed server roles on the computer that is running SQL Server 2008 Express or SQL Server 2008.

Enable FILESTREAM and provision the RBS data store

You must enable and configure FILESTREAM on the computer that is running SQL Server 2008 that hosts the SharePoint Foundation 2010 databases. To enable and configure FILESTREAM, follow the instructions in [How to: Enable FILESTREAM](http://go.microsoft.com/fwlink/?LinkID=166110&clcid=0x409) (*http://go.microsoft.com/fwlink/?LinkID=166110&clcid=0x409*). After you have enabled and configured FILESTREAM, provision a BLOB store as described in the following procedure.

To provision a BLOB Store with the FILESTREAM provider

1. Click **Start**, click **All Programs**, click **Microsoft SQL Server 2008**, and then click **SQL Server Management Studio**.
2. Expand **Databases**.
3. Select the content database for which you want to create a BLOB store, and then click **New Query**.
4. In the Query pane, copy and execute each of the following SQL queries in the sequence provided here.

   💡 **Tip:**
   For best performance, simplified troubleshooting, and as a general best practice, we recommend that you create the BLOB store on a volume that does not contain the operating system, paging files, database data, log files, or the tempdb file.
   use *[ContentDbName]*
   if not exists (select * from sys.symmetric_keys where name = N'##MS_DatabaseMasterKey##')create master key encryption by password = N'Admin Key Password !2#4'
   use *[ContentDbName]*
   if not exists (select groupname from sysfilegroups where groupname=N'RBSFilestreamProvider')alter database *[ContentDbName]* add filegroup RBSFilestreamProvider contains filestream
   use *[ContentDbName]*
   alter database *[ContentDbName]* add file (name = RBSFilestreamFile, filename = *'c:\Blobstore'*) to filegroup RBSFilestreamProvider
   Where *[ContentDbName]* is the content database name, and *c:\BLOBStore* is the volume\directory in which you want the BLOB store created. Be aware that you can provision a BLOB store only one time. If you attempt to provision the same BLOB store more than one time, you will receive an error.

Install RBS

You must install RBS on the database server and on all Web servers and application servers in the SharePoint farm. You must configure RBS separately for each associated content database.

⚠ **Warning:**

We do not recommend that you install RBS by running the RBS_X64.msi file and launching the Install SQL Remote BLOB Storage wizard. The wizard configures the RBS Maintainer to run a scheduled task every 30 days. This setting might not be optimal for your environment. For more information about the RBS Maintainer, see the SQL Server Help documentation that is included with the SQL Server Remote BLOB Store installation package from the Feature Pack for Microsoft SQL Server 2008 R2.

To install RBS on a Web server

1. On any Web server, go to http://go.microsoft.com/fwlink/?LinkID=177388 (*http://go.microsoft.com/fwlink/?LinkID=177388*) to download the RBS_X64.msi file.

   ◆ **Important:**

   You must install the version of RBS that is included in the SQL Server Remote BLOB Store installation package from the Feature Pack for Microsoft SQL Server 2008 R2. The version of RBS must be **10.50.xxx**. No earlier version of RBS is supported for SharePoint Foundation 2010.

2. Click **Start** and then type **cmd** in the text box. In the list of results, right-click **cmd**, and then click **Run as administrator**. Click **OK**.

3. Copy and paste the following command at the command prompt:

   msiexec /qn /lvx* rbs_install_log.txt /i RBS_X64.msi TRUSTSERVERCERTIFICATE=true FILEGROUP=PRIMARY DBNAME="*<ContentDbName>***" DBINSTANCE="***<DBInstanceName>***"** FILESTREAMFILEGROUP=RBSFilestreamProvider FILESTREAMSTORENAME=FilestreamProvider_1

   Where:

   - *<ContentDbName>* is the database name.
   - *<DBInstanceName>* is the SQL Server instance name.

     The operation should complete in approximately one minute.

To install RBS on all additional Web and application servers

1. On a Web server, go to http://go.microsoft.com/fwlink/?LinkID=177388 (*http://go.microsoft.com/fwlink/?LinkID=177388*) and download the RBS_X64.msi file.

   ◆ **Important:**

   You must install the version of RBS that is included in the SQL Server Remote BLOB Store installation package from the SQL Server Remote BLOB Store installation package from the Feature Pack for SQL Server 2008 R2. The version of RBS must be 10.50.xxx. No earlier version of RBS is supported for SharePoint Foundation 2010.

2. Click **Start** and then type **cmd** in the text box. In the list of results, right-click **cmd**, and then click **Run as administrator**. Click **OK**.

3. Copy and paste the following command at the command prompt:

    msiexec /qn /lvx* rbs_install_log.txt /i RBS_X64.msi DBNAME="*ContentDbName***"**
    DBINSTANCE="*DBInstanceName*"
    ADDLOCAL="Client,Docs,Maintainer,ServerScript,FilestreamClient,FilestreamServer"

    Where:
    - *ContentDbName* is the database name
    - *DBInstanceName* is the name of the SQL Server instance.

      The operation should finish within approximately one minute.

4. Repeat this procedure on all Web servers and application servers. If you do not
    install RBS on every Web and application server, users will encounter errors when
    they try to write to the content databases.

To confirm the RBS installation

1. The rbs_install_log.txt log file is created in the same location as the RBS_X64.msi
    file. Open the rbs_install_log.txt log file with a text editor and scroll toward the bottom
    of the file. Within the last 20 lines of the end of the file, an entry should read as
    follows: "Product: SQL Remote Blob Storage – Installation completed successfully".

2. On the computer that is running SQL Server 2008, verify that the RBS tables were
    created in the content database. Several tables should reside under the content
    database with names that are preceded by the letters "mssqlrbs".

Enable and test RBS

You must enable RBS on one Web server in the SharePoint farm. It does not matter
which Web server you choose for this activity, as long as RBS was installed on it by using
the previous procedure.

To enable RBS

1. On the **Start** menu, click **Programs**, click **Microsoft SharePoint 2010 Products**,
    and then click **SharePoint 2010 Management Shell**.

2. At the Windows PowerShell command prompt, type each of the following commands.

    $cdb = Get-SPContentDatabase -WebApplication *<http://SiteName>*

    Where *<http://SiteName>* is the URL of the Web application that is connected to the
    content database.

```
$rbss = $cdb.RemoteBlobStorageSettings
$rbss.Installed()
$rbss.Enable()
$rbss.SetActiveProviderName($rbss.GetProviderNames()[0])
$rbss
```

To test the RBS data store

1. Connect to a document library on any Web server.
2. Upload a file that is at least 100 kilobytes (KB) to the document library.
3. On the computer that contains the RBS data store, click **Start**, and then click **Computer**.
4. Browse to the RBS data store directory.
5. Browse to the file list and open the folder that has the most recent modified date (other than $FSLOG). In that folder, open the file that has the most recent modified date. Verify that this file has the same size and contents as the file that you uploaded. If it does not, ensure that RBS is installed and enabled correctly.

To enable additional databases to use RBS, see [Set a content database to use Remote Blob Storage (RBS) (SharePoint Foundation 2010)](http://technet.microsoft.com/library/64c80191-b6bd-44a8-a044-830f60d9191a(Office.14).aspx) (*http://technet.microsoft.com/library/64c80191-b6bd-44a8-a044-830f60d9191a(Office.14).aspx*).

Other Resources

[Migrate content into or out of Remote BLOB Storage (RBS) (SharePoint Foundation 2010)](http://technet.microsoft.com/library/8a5f834b-cac3-4bdc-b7cb-2247f5f3b2eb(Office.14).aspx) (*http://technet.microsoft.com/library/8a5f834b-cac3-4bdc-b7cb-2247f5f3b2eb(Office.14).aspx*)

[Disable Remote BLOB Service (RBS) on a content database (SharePoint Foundation 2010)](http://technet.microsoft.com/library/f9f562cd-0974-4a89-a23f-c34b1ff3412e(Office.14).aspx) (*http://technet.microsoft.com/library/f9f562cd-0974-4a89-a23f-c34b1ff3412e(Office.14).aspx*)

Install and configure RBS without the FILESTREAM provider (SharePoint Foundation 2010)

Published: May 12, 2010

This article describes how to install and configure Remote BLOB Storage (RBS) on a Microsoft SQL Server 2008 database server that supports a Microsoft SharePoint Foundation 2010 system. RBS is typically recommended in the case where the content databases are 4 gigabytes (4 GB) or larger.

In SharePoint Foundation 2010, the content databases are stored in Microsoft SQL Server 2008 Express and have a maximum size of 4 GB per database. Because Microsoft SQL Server 2008 R2 Express supports content databases that are up to 10 GB, we recommend that you install SQL Server 2008 R2 Express to support the content databases. For more information, see Microsoft SQL Server 2008 R2 Express Edition (*http://go.microsoft.com/fwlink/?LinkID=189418*).

RBS is a library API set that is incorporated as an add-on feature pack for Microsoft SQL Server 2008 and Microsoft SQL Server 2008 Express. RBS is designed to move the storage of binary large objects (BLOBs) from database servers to commodity storage solutions.

RBS uses a *provider* to connect to any dedicated BLOB store that implements the RBS APIs. RBS ships with the RBS FILESTREAM provider. Third-party RBS providers can also be used with the RBS APIs to create a BLOB storage solution.

If you decide to implement RBS by using a third-party provider instead of FILESTREAM, you can use the information in this article to install RBS without installing the FILESTREAM provider. Before you can use RBS, you must install the third-party provider by using the documentation that is supplied with that provider.

If you want to install and configure RBS with the FILESTREAM provider, see Install and configure RBS with the FILESTREAM provider (SharePoint Foundation 2010).

Before installing and implementing RBS, we highly recommend that you read the articles Overview of RBS (SharePoint Foundation 2010) and Plan for RBS (SharePoint Foundation 2010).

In this article:

- Install RBS
- Enable and test RBS

The user account that you use to perform the procedures that are described in this article must have the following memberships:

- Administrators group on the Web servers and application servers.
- SQL Server **dbcreator** and **securityadmin** fixed server roles on the computer that is running SQL Server 2008 Express or SQL Server 2008.

Install RBS

You must install RBS on the database server and on all Web servers and application servers in the SharePoint farm. You must configure RBS separately for each associated content database.

⚠️ **Warning:**

We do not recommend that you install RBS by running the RBS_X64.msi file and launching the Install SQL Remote BLOB Storage wizard. The wizard configures the RBS Maintainer to run a scheduled task every 30 days. This setting might not be optimal for your environment. For more information about the RBS Maintainer, see the SQL Server Help documentation that is included with the SQL Server Remote BLOB Store installation package from the Feature Pack for Microsoft SQL Server 2008 R2.

To install RBS on a Web server

1. On any Web server, go to http://go.microsoft.com/fwlink/?LinkID=177388 (*http://go.microsoft.com/fwlink/?LinkID=177388*) to download the RBS_X64.msi file. When prompted whether to **Run** or **Save** the file, click **Save**.

   🔷 **Important:**

   You must install the version of RBS that is included in the SQL Server Remote BLOB Store installation package from the Feature Pack for Microsoft SQL Server 2008 R2. The version of RBS must be 10.50.xxx. No earlier version of RBS is supported for SharePoint Foundation 2010.

2. Click **Start**, and then type **cmd** in the text box. In the list of results, right-click **cmd**, and then click **Run as administrator**. Click **OK**.

3. Copy and paste the following command at the command prompt:

   msiexec /lvx* rbs_install.log /q /i rbs.msi ADDLOCAL=ServerScript,Client,Maintainer

   The operation should finish in approximately one minute.

   Repeat this procedure on every Web server and application server in the farm. If you do not install RBS on every Web and application server, users will encounter errors when they try to write to the content databases.

To install RBS on the database server and set a content database to use RBS

1. On the database server, go to http://go.microsoft.com/fwlink/?LinkID=177388 (*http://go.microsoft.com/fwlink/?LinkID=177388*) and download the RBS_X64.msi file.

   ◆ **Important:**

   You must install the version of RBS that is included in the SQL Server Remote BLOB Store installation package from the Feature Pack for Microsoft SQL Server 2008 R2. The version of RBS must be 10.50.xxx. No earlier version of RBS is supported for SharePoint Foundation 2010.

2. Click **Start** and then type **cmd** in the text box. In the list of results, right-click **cmd**, and then click **Run as administrator**. Click **OK**.

3. Copy and paste the following command at the command prompt:

   msiexec /lvx* rbs_enable_WSS_Content.log /q /i rbs.msi ADDLOCAL=EnableRBS DBINSTANCE="<*DBInstanceName*>**" DBNAME="**<*ContentDbName*>**"**

   Where:

   - <*DBInstanceName*> is the name of the SQL Server instance.
   - <*ContentDbName*> is the name of the content database.

     The operation should finish within approximately one minute.

     To set additional content databases to use RBS, see Set a content database to use Remote Blob Storage (RBS) (SharePoint Foundation 2010) (*http://technet.microsoft.com/library/64c80191-b6bd-44a8-a044-830f60d9191a(Office.14).aspx*).

To confirm the RBS installation

1. The rbs_install_log.txt log file is created in the same location as the RBS_X64.msi file. Open the rbs_install_log.txt log file by using a text editor and scroll toward the bottom of the file. Within the last 20 lines of the end of the file, an entry should read as follows: "Product: SQL Remote Blob Storage – Installation completed successfully"

   .

2. On the computer that is running SQL Server 2008, verify that the RBS tables were created in the content database. Several tables that have names that are preceded by the letters "mssqlrbs" should be located under the content database name.

Enable and test RBS

You must enable RBS on one Web server in the SharePoint farm. It is not important which Web server that you select for this activity, as long as RBS was installed on it by using the previous procedure.

To enable RBS

1. On the **Start** menu, click **Programs**, click **Microsoft SharePoint 2010 Products**, and then click **SharePoint 2010 Management Shell**.

2. At the Windows PowerShell command prompt, type the following commands:

   $cdb = Get-SPContentDatabase –WebApplication *<http://SiteName>*

   Where *<http://SiteName>* is the Web application that is attached to the content database.

   $rbss = $cdb.RemoteBlobStorageSettings
   $rbss.Installed()
   $rbss.Enable()
   $rbss

To test the RBS data store

1. Connect to a document library on any Web server.

2. Upload a file that is at least 100 kilobytes (KB) to the document library.

3. On the computer that contains the RBS data store, click **Start**, and then click **Computer**.

4. Browse to the RBS data store directory.

5. Browse to the file list and open the folder that has the most recent modified date (other than $FSLOG). In that folder, open the file that has the most recent modified date. Verify that this file has the same size and contents as the file that you uploaded. If it does not, ensure that RBS is installed and enabled correctly.

Other Resources

Migrate content into or out of Remote BLOB Storage (RBS) (SharePoint Foundation 2010) (*http://technet.microsoft.com/library/8a5f834b-cac3-4bdc-b7cb-2247f5f3b2eb(Office.14).aspx*)

Disable Remote BLOB Service (RBS) on a content database (SharePoint Foundation 2010) (*http://technet.microsoft.com/library/f9f562cd-0974-4a89-a23f-c34b1ff3412e(Office.14).aspx*)

Upgrading from a stand-alone installation of Windows SharePoint Services 3.0 to SharePoint Foundation 2010 when content databases exceed 4 GB (RBS)

Published: May 12, 2010

This article describes the circumstances in which you might want to upgrade from a stand-alone Windows SharePoint Services 3.0 system to SharePoint Foundation 2010 with Remote BLOB Storage (RBS).

When you upgrade from a stand-alone installation of Windows SharePoint Services 3.0 to Microsoft SharePoint Foundation 2010, the upgrade process differs depending on the size of the content databases.

In a stand-alone installation of Windows SharePoint Services 3.0, content databases are stored in Windows Internal Database and have no size limitations. Conversely, in SharePoint Foundation 2010, the content databases are stored in Microsoft SQL Server 2008 Express and have a maximum size of 4 gigabytes (GB) per database. If you have databases that are larger than 4 GB, you must either use Microsoft SQL Server 2008 R2, SQL Server 2008 with Service Pack 1 (SP1) and Cumulative Update 2, or SQL Server 2005 with SP3 and Cumulative Update 3, or install Remote BLOB Storage (RBS).

Note:

Microsoft SQL Server 2008 R2 Express supports databases up to 10 GB. If the installation includes databases that are larger than 4 GB but smaller than 10 GB, you can upgrade to SQL Server 2008 R2 Express for your content database storage solution instead of implementing RBS. SQL Server 2008 R2 Express is available for download and installation at Microsoft SQL Server 2008 R2 Express Edition (*http://go.microsoft.com/fwlink/?LinkID=189418*).

RBS is designed to move the storage of binary large objects (BLOBs) from database servers to commodity storage solutions. RBS is an add-on that can be applied to SQL Server 2008 Express and to SQL Server 2008. For more information about RBS, see Overview of RBS (SharePoint Foundation 2010).

If you are upgrading fromWindows SharePoint Services 3.0 and all databases are smaller than 4 GB, you can follow the standard in-place upgrade process. For details, see Upgrade in place to SharePoint Foundation 2010 (*http://technet.microsoft.com/library/dd03cc53-718c-4183-af99-a5f309010fe6(Office.14).aspx*).

If you are upgrading from Windows SharePoint Services 3.0 and the search database is larger than 4 GB, you cannot migrate that database. To upgrade, you must remove the existing instance of search before migrating and upgrading. After upgrading, you can create a new instance of search. The search database is limited to 4 GB if the new installation is hosted on SQL Server 2008 Express.

If you are upgrading from Windows SharePoint Services 3.0 and the configuration database is larger than 4 GB, you cannot migrate the configuration database. Instead, you must either create a new SharePoint Foundation system that uses SQL Server 2008 Express (if the configuration database is not expected to grow larger than 4 GB), or create a new installation that uses SQL Server 2008 Standard or SQL Server 2008 Enterprise. You can also migrate the existing system to SQL Server 2008 Standard or SQL Server 2008 Enterprise and then upgrade it.

If you are not upgrading an existing Windows SharePoint Services 3.0 system and you want to install and configure RBS in SharePoint Foundation 2010, see Install and configure RBS with the FILESTREAM provider (SharePoint Foundation 2010).

Note:

If after you move content into RBS, a content database remains that is larger than 4 GB, the migration operation will fail. This failure typically occurs only with very large databases (20 GB or larger), but it can also occur if there is a smaller database that contains too much metadata.

If the configuration includes SharePoint databases that are larger than 16 GB, RBS is unlikely to provide a full solution to the limitations of SQL Server 2008 Express and SQL Server 2008 R2 Express. In this case, you should be prepared to use SQL Server 2008 Standard or SQL Server 2008 Enterprise to support the SharePoint databases.

Before beginning the upgrade process, confirm that the hardware configuration supports SharePoint Foundation 2010. For more information, see Determine hardware and software requirements (SharePoint Foundation 2010) (*http://technet.microsoft.com/library/dcdb7f80-5d48-4b7c-9cb5-affa5f293653(Office.14).aspx*).

In This Section

- Upgrade a stand-alone installation by using RBS (in-place) (SharePoint Foundation 2010)

  This article describes how to upgrade from a stand-alone Windows SharePoint Services 3.0 system that has content databases that are larger than 4 GB to SharePoint Foundation 2010.

- [Upgrade a stand-alone installation on a domain controller by using RBS (database attach) (SharePoint Foundation 2010)](#)

  This article describes how to upgrade from a stand-alone Windows SharePoint Services 3.0 system that has content databases that are larger than 4 GB to a SharePoint Foundation 2010 system that is running on a domain controller.

- [Upgrade a stand-alone installation to new hardware by using RBS (database attach) (SharePoint Foundation 2010)](#)

  This article describes how to upgrade from a stand-alone Windows SharePoint Services 3.0 system that has content databases that are larger than 4 GB to SharePoint Foundation 2010 that is installed on new hardware.

Concepts

[Plan for RBS (SharePoint Foundation 2010)](#)

Other Resources

[Downloadable book: Upgrading to SharePoint Foundation 2010](#)
(*http://go.microsoft.com/fwlink/?LinkId=196159*)

[Resource Center: Upgrade and Migration for SharePoint Foundation 2010](#)
(*http://technet.microsoft.com/en-us/sharepoint/ee517215.aspx*)

Upgrade a stand-alone installation by using RBS (in-place) (SharePoint Foundation 2010)

Published: May 12, 2010

This article describes how to upgrade from a stand-alone Windows SharePoint Services 3.0 system that has content databases that range in size from 4 gigabytes (GB) to 16 GB to Microsoft SharePoint Foundation 2010 with Remote BLOB Storage (RBS).

Note:

Microsoft SQL Server 2008 R2 Express supports databases up to 10 GB. If the installation includes content databases that are larger than 4 GB but smaller than 10 GB, you can upgrade to SQL Server 2008 R2 Express for your content database storage solution instead of implementing RBS. For more information, see Microsoft SQL Server 2008 R2 Express Edition (*http://go.microsoft.com/fwlink/?LinkID=189418*).

Before performing the operations described in this article, we strongly recommend that you read the following articles to ensure that you are following the best upgrade path:

- Plan for RBS (SharePoint Foundation 2010)
- Overview of RBS (SharePoint Foundation 2010)
- Upgrading from a stand-alone installation of Windows SharePoint Services 3.0 to SharePoint Foundation 2010 when content databases exceed 4 GB (RBS)

To upgrade from a stand-alone installation of Windows SharePoint Services 3.0 to SharePoint Foundation 2010 with RBS

1. Verify that the user account that is used to perform the upgrade and installation is a member of the Administrators group on the computer running Windows SharePoint Services 3.0 on which the upgrade is being performed and on which RBS is being installed.

2. Confirm that the hardware configuration supports SharePoint Foundation 2010. For more information, see Determine hardware and software requirements (SharePoint Foundation 2010) (*http://technet.microsoft.com/library/dcdb7f80-5d48-4b7c-9cb5-affa5f293653(Office.14).aspx*).

3. Verify that the available disk space meets the following requirements:

   - Available disk space is at least twice the size of the largest content database.

- Available disk space is equal to or greater than the sum of the sizes of all content databases.

4. Download the SharePoint Foundation 2010 software updates from the upgrade site.

5. Open the local folder that contains the software download, and then double-click **PrerequisiteInstaller**. Accept the default values, and then complete the Prerequisite Installer Wizard.

6. Double-click **Setup**, accept the default values, and then complete the Setup Wizard.

   When Setup completes, the SharePoint Products Configuration Wizard automatically runs. If the wizard detects a SharePoint database that is larger than 4 GB, a message appears that notifies you that you must migrate the databases to RBS.

   ### 📝 Note:

   If any SharePoint database is larger than 4 GB, all SharePoint databases must be migrated to RBS, even if some databases are smaller than 4 GB.

7. If you have not previously installed RBS on the server, the SharePoint Products Configuration Wizard fails, and then displays an error message that explains that databases larger than 4 GB were detected and that RBS must be installed. If you must install RBS, continue with the following steps. If you have already installed RBS on the server, the wizard completes successfully without displaying the error message.

8. Go to http://go.microsoft.com/fwlink/?LinkID=177388 (*http://go.microsoft.com/fwlink/?LinkID=177388*) to download the RBS_X64.msi file.

   ### 🔷 Important:

   You must install the version of RBS that is included in the SQL Server Remote BLOB Store installation package from the SQL Server Remote BLOB Store installation package from the Feature Pack for Microsoft SQL Server 2008 R2. The version of RBS must be **10.50.xxx**. No earlier version of RBS is supported for SharePoint Foundation 2010.

9. Open the folder that contains the file, and then double-click **RBS_X64.msi** to start the Install SQL Remote BLOB Storage Wizard.

10. In the Install SQL Remote BLOB Storage Wizard, on the Feature Selection page, expand **Server**, click the down arrow next to **Execute scripts**, and then click **Entire feature will be unavailable**.

11. Expand **FILESTREAM Provider**, expand **Server**, click the down arrow next to **Execute scripts**, and then click **Entire feature will be unavailable**.

12. Complete the wizard by using the default values.

13. Click **Start**, click **All Programs**, click **Microsoft SharePoint 2010 Products**, and then click **SharePoint 2010 Products Configuration Wizard**.

14. The wizard completes the upgrade.

Other Resources

What's new in upgrade (SharePoint Foundation 2010)
(*http://technet.microsoft.com/library/8e57c2fe-85eb-48d3-bdab-
b834ebaab134(Office.14).aspx*)

Upgrade process overview (SharePoint Foundation 2010)
(*http://technet.microsoft.com/library/df43c3d7-b8a8-460c-bf3e-
a46939d640d0(Office.14).aspx*)

Downloadable book: Upgrading to SharePoint Foundation 2010
(*http://go.microsoft.com/fwlink/?LinkId=196159*)

Resource Center: Upgrade and Migration for SharePoint Foundation 2010
(*http://technet.microsoft.com/en-us/sharepoint/ee517215.aspx*)

Upgrade a stand-alone installation on a domain controller by using RBS (database attach) (SharePoint Foundation 2010)

Published: May 12, 2010

This article discusses the upgrade procedures that are required to upgrade from a stand-alone Windows SharePoint Services 3.0 system that is running on a domain controller to Microsoft SharePoint Foundation 2010 with Remote BLOB Storage (RBS). We typically recommend that you use RBS if the content databases are 4 gigabytes (GB) or larger.

⬥ **Important:**

We strongly recommend that you read the article Upgrading from a stand-alone installation of Windows SharePoint Services 3.0 to SharePoint Foundation 2010 when content databases exceed 4 GB (RBS) for important information and recommendations about how to upgrade from Windows SharePoint Services 3.0 to SharePoint Foundation 2010 with RBS.

You can use RBS to move the storage of binary large objects (BLOBs) from database servers to commodity storage solutions. RBS is an add-on that can be applied to SQL Server 2008 Express and to SQL Server 2008.

The implementation of RBS that is discussed in this article uses the SQL Server FILESTREAM provider. For more information about RBS and the FILESTREAM provider, see Overview of RBS (SharePoint Foundation 2010).

In SharePoint Foundation 2010, the content databases are stored in SQL Server 2008 Express and have a maximum size of 4 GB per database. Because Microsoft SQL Server 2008 R2 Express supports content databases that are up to 10 GB, we recommend that you install SQL Server 2008 R2 Express to support the content databases.

This article is not a comprehensive guide to upgrading to SharePoint Foundation 2010. Instead, it refers you to the articles you should read to perform the upgrade. This article contains the additional steps that are required to install and implement RBS on a domain controller installation of SharePoint Foundation 2010.

Before beginning the upgrade process, read the following articles and create an upgrade plan:

- About the upgrade process (SharePoint Foundation 2010) (*http://technet.microsoft.com/library/bc9d2c96-6ba0-498d-8ffb-75fa234a7e7a(Office.14).aspx*)
- Plan and prepare for upgrade (SharePoint Foundation 2010) (*http://technet.microsoft.com/library/cb22a4d2-e8ac-4578-8fb0-4ab03dafd3bd(Office.14).aspx*)
- Upgrading from a stand-alone installation of Windows SharePoint Services 3.0 to SharePoint Foundation 2010 when content databases exceed 4 GB (RBS)

Procedures in this article:

- To prepare for the upgrade to SharePoint Foundation 2010 with RBS on a domain controller
- To install SQL Server 2008 Express R2
- To install RBS
- To install SharePoint Foundation 2010
- To install SharePoint Foundation 2010

To prepare for the upgrade to SharePoint Foundation 2010 with RBS on a domain controller

1. Verify that the user account that is used to perform the upgrade and installation meets the requirements listed in Administrative and service accounts required for initial deployment (SharePoint Foundation 2010) (*http://technet.microsoft.com/library/b1aee1ea-45f6-4e05-ad93-9086f6ad7e79(Office.14).aspx*).

2. Verify that the user account is a member of the Administrators group on the local computer.

3. Confirm that the hardware configuration supports SharePoint Foundation 2010. For more information, see Determine hardware and software requirements (SharePoint Foundation 2010) (*http://technet.microsoft.com/library/dcdb7f80-5d48-4b7c-9cb5-affa5f293653(Office.14).aspx*).

4. Verify that the available disk space meets the following requirements:

    - Available disk space is at least two times the size of the largest content database.
    - Available disk space is equal to or greater than the sum of the sizes of all content databases.

5. Perform the pre-upgrade tasks that are discussed in the article Perform pre-upgrade steps (SharePoint Foundation 2010) (*http://technet.microsoft.com/library/0aa86bfa-4752-48eb-a33c-044eace74fb8(Office.14).aspx*). These are as follows:

- Run the pre-upgrade checker (SharePoint Foundation 2010)
  (*http://technet.microsoft.com/library/035a3024-bd27-4d63-9499-0f15ac00c6e6(Office.14).aspx*)

  The pre-upgrade checker report includes the names of all content databases. You will need this list to enable RBS for the content databases.

  If you have multiple Web applications, you should compile a list of which content databases are attached to which Web applications. You will need this information after the upgrade.

- Back up the entire environment before an in-place upgrade (SharePoint Foundation 2010) (*http://technet.microsoft.com/library/2a005b70-2f53-42a1-89e0-f907a8e98623(Office.14).aspx*)

To install SQL Server 2008 Express R2

1. Download SQL Server 2008 R2 Express from Microsoft SQL Server 2008 R2 Express Edition (*http://go.microsoft.com/fwlink/?LinkID=189418*).

2. Follow the on-screen instructions to install SQL Server 2008 R2 Express on the domain controller.

   For more information about how to install SQL Server 2008 R2 Express, see How to: Install SQL Server 2008 (Setup)
   (*http://go.microsoft.com/fwlink/?LinkID=186119&clcid=0x409*).

   Accept the default settings for most of the installation options. You should specifically accept the following options:

   a) On the Feature Selection page, you can select the components for the installation. Be sure to select **SQL Server Management Studio** as a feature to install.

   b) On the Instance Configuration page, specify whether to install a default instance or a named instance. If you create a named instance, note the instance name because you will need this name in a later procedure in this article.

   c) On the Server Configuration — Service Accounts page, you must specify login accounts for SQL Server services. You can assign the same login account to all SQL Server services, or you can configure each service account individually. You must use a domain account as the login account for the SQL Server Database Engine.

   d) On the Database Engine Configuration page, make sure that the domain account that is used for this installation is listed as a SQL Server administrator.

To install RBS

1. Go to http://go.microsoft.com/fwlink/?LinkID=177388
   (*http://go.microsoft.com/fwlink/?LinkID=177388*) to download the RBS_X64.msi file.

You must install the version of RBS that is included in the SQL Server Remote BLOB Store installation package from the Feature Pack for Microsoft SQL Server 2008 R2. The version of RBS must be **10.50.xxx**. No earlier version of RBS is supported for SharePoint Foundation 2010.

2. Open the folder that contains the file, and then double-click **RBS_X64.msi** to start the Install SQL Remote BLOB Storage Wizard.

3. In the Install SQL Remote BLOB Storage Wizard, on the Feature Selection page, expand **Server**, click the down arrow next to **Execute scripts**, and then click **Entire feature will be unavailable**.

4. Expand **FILESTREAM Provider**, expand **Server**, click the down arrow next to **Execute scripts**, and then click **Entire feature will be unavailable**.

📝 **Note:**

The database that will host the scripts does not yet exist because it will be created during the database upgrade process. The Execute scripts option will be installed automatically during the installation of SharePoint Foundation 2010.

5. Complete the wizard by using the default values.

During the installation, a dialog box appears that describes an RBS Maintainer task. Click **OK** in that dialog box to continue with the installation.

To install SharePoint Foundation 2010

1. Uninstall all previous versions of SharePoint Products and Technologies that exist on the domain controller by using Control Panel.

2. Install SharePoint Foundation 2010 by following the instructions in Install SharePoint Foundation 2010 on the farm servers (*http://technet.microsoft.com/library/246fb1c9-660e-40b5-860b-7d681f04505a(Office.14).aspx#InstallSF*). During the installation, you must use the database instance name that you created in Step 2 of the procedure To install SQL Server 2008 Express R2. If you used the default named instance in that step, you must enter it in this step as **"SQLExpress"**. If you used the default instance, you must type **" "** here instead of using the default SQLExpress named instance.

Note that you are creating a new installation of SharePoint Foundation 2010. You are performing a database attach upgrade, not an in-place upgrade.

📝 **Note:**

After you install SharePoint Foundation 2010, do not create any Web applications until instructed to do this later in this article.

To migrate the content database to RBS and complete the installation

1. Verify that the user account that is performing this procedure is the same user account that was used to install the farm running SharePoint Foundation 2010 and RBS.

2. On the **Start** menu, click **All Programs**.

3. Click **Microsoft SharePoint 2010 Products**.

4. Click **SharePoint 2010 Management Shell**.

5. At the Windows PowerShell command prompt, type the following command to migrate the content database to RBS:

   Move-SPBlobStorageLocation –SourceDatabase "<ContentDbName>**" –**DestinationDataSourceInstance "<InstanceName>"

   Where:

   - <ContentDbName> is the name of the content database.

   - <InstanceName> is the name of the SQL Server database instance name that you created in Step 2 of the procedure To install SQL Server 2008 Express R2. If you used the default named instance in that step, you must enter it here as **"SQLExpress"**. If you used the default instance, you must type **" "** here instead of using the default "SQLExpress" named instance.

     You must repeat this command for each content database. Refer to the list of content databases that was generated by the Pre-upgrade checker in Step 5 of the To prepare for the upgrade to SharePoint Foundation 2010 with RBS on a domain controller procedure earlier in this article.

6. Create the Web applications to which the content databases will be attached. For information about how to create a Web application in SharePoint Foundation 2010, see Create a Web application (SharePoint Foundation 2010) (*http://technet.microsoft.com/library/d91d600f-10e6-4aac-af24-5e5d69860049(Office.14).aspx*) or Configure a claims-based Web application (SharePoint Foundation 2010) (*http://technet.microsoft.com/library/bac469d0-7bf2-493f-9bc4-6095f8d68480(Office.14).aspx*).

7. To attach and upgrade the content database to a SharePoint Foundation 2010 Web application, type the following command:

   Mount-SPContentDatabase "<ContentDbName>**" –DatabaseServer "**<DbServer>**" –**WebApplication <http://SiteName>

   Where:

   - <ContentDbName> is the name of the database.

   - <DbServer>is the name of the database server.

   - <http://SiteName> is the URL of the Web application.

     For more information, see Move-SPBlobStorageLocation (*http://technet.microsoft.com/library/5b66feac-c365-4dfd-9ccb-a66a4faa617f(Office.14).aspx*) and Mount-SPContentDatabase (*http://technet.microsoft.com/library/20d1bc07-805c-44d3-a278-e2793370e237(Office.14).aspx*).

8. Create or restore needed customizations onto the new system. For recommended post-upgrade steps, see Perform post-upgrade steps (SharePoint Foundation 2010) (*http://technet.microsoft.com/library/120e011b-43c2-4165-82fe-52877c2d259b(Office.14).aspx*).

Concepts

Plan for RBS (SharePoint Foundation 2010)

Other Resources

What's new in upgrade (SharePoint Foundation 2010) (*http://technet.microsoft.com/library/8e57c2fe-85eb-48d3-bdab-b834ebaab134(Office.14).aspx*)

Downloadable book: Upgrading to SharePoint Foundation 2010 (*http://go.microsoft.com/fwlink/?LinkId=196159*)

Resource Center: Upgrade and Migration for SharePoint Foundation 2010 (*http://technet.microsoft.com/en-us/sharepoint/ee517215.aspx*)

Upgrade a stand-alone installation to new hardware by using RBS (database attach) (SharePoint Foundation 2010)

Published: May 12, 2010

This article discusses the upgrade procedures that are required to upgrade from a stand-alone Windows SharePoint Services 3.0 system to an installation of SharePoint Foundation 2010 with Remote BLOB Storage (RBS) onto a new hardware platform.

✦ **Important:**

We strongly recommend that you read the article Upgrading from a stand-alone installation of Windows SharePoint Services 3.0 to SharePoint Foundation 2010 when content databases exceed 4 GB (RBS) for important information and recommendations about how to upgrade from Windows SharePoint Services 3.0 to Microsoft SharePoint Foundation 2010 together with RBS.

RBS is designed to move the storage of binary large objects (BLOBs) from database servers to commodity storage solutions. RBS is an add-on that can be applied to Microsoft SQL Server 2008 Express and Microsoft SQL Server 2008 R2 Express. This implementation of RBS uses the SQL FILESTREAM provider. For more information about RBS and the FILESTREAM provider, see Overview of RBS (SharePoint Foundation 2010).

Because of the database size limitations in SQL Server 2008 Express, install Windows Internal Database and restore the Windows SharePoint Services 3.0 databases into Windows Internal Database. You then install RBS, move the content database from Windows Internal Database into SQL Server, and then move the BLOBs into a content database that is set to use RBS.

By default, content databases in SharePoint Foundation 2010 are stored in SQL Server 2008 Express, which has a maximum size of 4 gigabytes (GB) per content database. Because SQL Server 2008 R2 Express supports content databases that are up to 10 GB, we recommend you install SQL Server 2008 R2 Express to support content databases. SQL Server 2008 R2 Express is a free upgrade that you can download and install from Microsoft SQL Server 2008 R2 Express Edition (*http://go.microsoft.com/fwlink/?LinkID=189418*).

Note:

This article assumes that you have installed SQL Server Management Studio on the database server in the Windows SharePoint Services 3.0 farm. If you do not have this software installed, you can download and install it from Microsoft® SQL Server® 2008 Management Studio Express (*http://go.microsoft.com/fwlink/?LinkID=186132&clcid=0x409*).

This article is not a comprehensive guide to upgrading to SharePoint Foundation 2010. Before you begin the upgrade process, read the following articles and create an upgrade plan:

- About the upgrade process (SharePoint Foundation 2010) (*http://technet.microsoft.com/library/bc9d2c96-6ba0-498d-8ffb-75fa234a7e7a(Office.14).aspx*)
- Plan and prepare for upgrade (SharePoint Foundation 2010) (*http://technet.microsoft.com/library/cb22a4d2-e8ac-4578-8fb0-4ab03dafd3bd(Office.14).aspx*)
- Upgrading from a stand-alone installation of Windows SharePoint Services 3.0 to SharePoint Foundation 2010 when content databases exceed 4 GB (RBS)

In this article:

- To prepare for the upgrade to SharePoint Foundation 2010 on the original server
- To prepare for the upgrade to SharePoint Foundation 2010 on the new server
- To install and configure Windows Internal Database on the new server
- To move the content databases to the new server
- To install SQL Server Express 2008 R2 on the new server
- To install RBS on the new server
- To install SharePoint Foundation 2010 on the new server
- To migrate the content database to RBS and complete the installation

To prepare for the upgrade to SharePoint Foundation 2010 on the original server

1. Verify that the user account that is used to perform this procedure meets the requirements listed in Administrative and service accounts required for initial deployment (SharePoint Foundation 2010) (*http://technet.microsoft.com/library/b1aee1ea-45f6-4e05-ad93-9086f6ad7e79(Office.14).aspx*), and that the user account is a member of the Administrators group on the local computer.

2. Verify that Management Studio is installed on the original server.

3. Back up the content databases by using the procedure described in How to: Back Up a Database (SQL Server Management Studio) (*http://go.microsoft.com/fwlink/?LinkID=187768&clcid=0x409*).

You can use the default settings for most options, but you must use the following settings:

- In step 1, you must set the instance name for Windows Internal Database as **\\.\pipe\MSSQL$MICROSOFT##SSEE\sql\query**.

- In Step 12, select the option **Destination**. Make sure that the destination media has sufficient free space for the backup.

4. Run the pre-upgrade checker that is discussed in the article [Perform pre-upgrade steps (SharePoint Foundation 2010)](http://technet.microsoft.com/library/0aa86bfa-4752-48eb-a33c-044eace74fb8(Office.14).aspx) (*http://technet.microsoft.com/library/0aa86bfa-4752-48eb-a33c-044eace74fb8(Office.14).aspx*).

    The pre-upgrade checker report includes the names of all content databases. You have to have this list to migrate content databases to RBS. If you have multiple Web applications, you should also note which content databases are attached to which Web applications.

To prepare for the upgrade to SharePoint Foundation 2010 on the new server

1. Verify that the user account that is used to perform the upgrade and installation meets the requirements listed in [Administrative and service accounts required for initial deployment (SharePoint Foundation 2010)](http://technet.microsoft.com/library/b1aee1ea-45f6-4e05-ad93-9086f6ad7e79(Office.14).aspx) (*http://technet.microsoft.com/library/b1aee1ea-45f6-4e05-ad93-9086f6ad7e79(Office.14).aspx*), and that the user account is a member of the Administrators group on the local computer.

2. Confirm that the hardware configuration supports SharePoint Foundation 2010. For more information, see [Hardware and software requirements (SharePoint Foundation 2010)](http://technet.microsoft.com/library/dcdb7f80-5d48-4b7c-9cb5-affa5f293653(Office.14).aspx) (*http://technet.microsoft.com/library/dcdb7f80-5d48-4b7c-9cb5-affa5f293653(Office.14).aspx*).

3. Verify that the available disk space meets the following requirements:

    - Available disk space is at least twice the size of the largest content database.

    - Available disk space is equal to or greater than the sum of the sizes of all content databases.

To install and configure Windows Internal Database on the new server

1. Click **Start**, and click **Server Manager**.
2. In Server Manager, click **Features** and then click **Add Features**.
3. In the Add Features wizard, scroll down the list of features, and then select **Windows Internal Database**.
4. Click **Install**.
5. Exit Server Manager.
6. Click **Start**, click **Administrative Tools**, and then click **Computer Management**.
7. Expand **Services and Applications**.
8. Click **Services**.

9. In the **Services** pane, right-click **Windows Internal Database**, and then click **Properties**.

10. Use the drop-down menu to change the **Startup type** to **Automatic**.

11. Click **Start** to start the service.

12. Click **OK**, and then exit Computer Management.

To move the content databases to the new server

1. Copy the content database backup files that you created in the procedure To prepare for the upgrade to SharePoint Foundation 2010 on the original server to the new server.

2. On the new server, download and install Management Studio from Microsoft® SQL Server® 2008 Management Studio Express (*http://go.microsoft.com/fwlink/?LinkID=186132&clcid=0x409*).

3. Use the instructions at How to: Restore a Database Backup (SQL Server Management Studio) (*http://go.microsoft.com/fwlink/?LinkID=187769&clcid=0x409*) to restore the databases by using Management Studio.

   Use the following settings for the restore procedure:

   - In Step 1, use the following name for the Windows Internal Database instance: **\\.\pipe\MSSQL$MICROSOFT##SSEE\sql\query**.

   - In Step 5, enter the correct database name to be restored. We recommend that you use the same name that was used when the database was backed up.

   - In Step 7, select the database file that you copied in Step 1.

   - Accept all other default options and complete the restore.

To install SQL Server Express 2008 R2 on the new server

1. Download SQL Server 2008 R2 Express from Microsoft SQL Server 2008 R2 Express Edition (*http://go.microsoft.com/fwlink/?LinkID=189418*).

2. Follow the onscreen instructions to install SQL Server 2008 R2 Express.

   For additional information, see How to: Install SQL Server 2008 (Setup) (*http://go.microsoft.com/fwlink/?LinkID=187771&clcid=0x409*).

   Especially note the following settings:

   - On the Instance Configuration page, specify whether to install a **Default instance** or a **Named instance**. If you create a named instance, note the instance name. You have to supply this name in a later procedure.

   - On the Server Configuration — Service Accounts page, you must specify login accounts for SQL Server services. You can assign the same login account to all SQL Server services, or you can configure each service account individually.

   - On the Database Engine Configuration page, make sure that the domain account that is being used for this installation is listed as a SQL Server administrator.

To install RBS on the new server

1. Go to http://go.microsoft.com/fwlink/?LinkID=177388
    (*http://go.microsoft.com/fwlink/?LinkID=177388*) to download the RBS_X64.msi file.

    ◆ **Important:**

    You must install the version of RBS that is included in the SQL Server Remote BLOB
    Store installation package from the Feature Pack for Microsoft SQL Server 2008 R2. The
    version of RBS must be **10.50.xxx**. No earlier version of RBS is supported for SharePoint
    Foundation 2010.

2. Open the folder that contains the .msi file, and double-click **RBS_X64.msi** to start the
    Install SQL Remote BLOB Storage Wizard.

3. In the Install SQL Remote BLOB Storage Wizard, on the Feature Selection page,
    expand **Server**, click the down arrow next to **Execute scripts**, and then click **Entire
    feature will be unavailable**.

4. Expand **FILESTREAM Provider**, expand **Server**, click the down arrow next to
    Execute scripts, and then click **Entire feature will be unavailable**.

    📝 **Note:**

    The database that will host the scripts does not yet exist. It is created during the
    database upgrade process. The Execute scripts option will be installed automatically
    during the installation of SharePoint Foundation 2010.

5. Complete the wizard by using the default values.

    During the installation, a dialog box appears about an RBS Maintainer task. Click **OK**
    in that dialog box to proceed with the installation.

To install SharePoint Foundation 2010 on the new server

1. Install SharePoint Foundation 2010 by following the instructions in Install SharePoint
    Foundation 2010 on the farm servers (*http://technet.microsoft.com/library/246fb1c9-
    660e-40b5-860b-7d681f04505a(Office.14).aspx#InstallSF*). You must use the
    database instance name that you created in Step 2 of the procedure To install SQL
    Server Express 2008 R2 on the new serverthat you performed earlier in this article. If
    you used the default named instance in that step, you must enter it here as
    "SQLExpress". If you used the default instance, then you must enter **" "** here
    instead of using the default SQLExpress named instance.

    Note that you are creating a new installation ofSharePoint Foundation 2010. You are
    performing a database attach upgrade, not an in-place upgrade.

    📝 **Note:**

    After you install SharePoint Foundation 2010, do not create any Web applications until
    instructed to do this later in this article.

To migrate the content database to RBS and complete the installation

1. Verify that the same user account that was used to install SharePoint Foundation 2010 and RBS is the user account that is performing this procedure.

2. On the **Start** menu, click **All Programs**.

3. Click **Microsoft SharePoint 2010 Products**.

4. Click **SharePoint 2010 Management Shell**.

5. At the Windows PowerShell command prompt, type the following command to migrate the content database to RBS. You must repeat this command for each content database. Refer to the list of content databases that was generated by the Pre-upgrade checker in Step 4 of the procedure To prepare for the upgrade to SharePoint Foundation 2010 on the original server earlier in this article.

   Move-SPBlobStorageLocation –SourceDatabase "*<DbName>***" –** DestinationDataSourceInstance "*<InstanceName>*"

   Where:

   - *<DbName>* is the name of the content database that you restored into Windows Internal Database.

   - *<InstanceName>* is the name of the SQL Server database instance that you created in the procedure To install SQL Server Express 2008 R2 on the new server earlier in this article. If you used the default named instance in that step, you must enter it here as **"SQLExpress"**. If you used the default instance, then you must enter **" "** here instead of using the default SQLExpress named instance.

6. Create the Web applications that attach to the content database. For information about how to create a Web application in SharePoint Foundation 2010, see Create a Web application (SharePoint Foundation 2010) (*http://technet.microsoft.com/library/d91d600f-10e6-4aac-af24-5e5d69860049(Office.14).aspx*) or Configure a claims-based Web application (SharePoint Foundation 2010) (*http://technet.microsoft.com/library/bac469d0-7bf2-493f-9bc4-6095f8d68480(Office.14).aspx*).

7. Type the following command to attach and upgrade a content database to a Web application:

   Mount-SPContentDatabase "*<DbName>***" –**WebApplication *<http://SiteName>*

   Where:

   - *<DbName>* is the name of the database.

   - *<http://SiteName>* is the name of the Web application.

     Repeat this command for each content database.

     For more information, see Move-SPBlobStorageLocation (*http://technet.microsoft.com/library/5b66feac-c365-4dfd-9ccb-a66a4faa617f(Office.14).aspx*) and Mount-SPContentDatabase (*http://technet.microsoft.com/library/20d1bc07-805c-44d3-a278-e2793370e237(Office.14).aspx*).

8. Create or restore needed customizations onto the new system. For recommended post-upgrade steps, see Perform post-upgrade steps (SharePoint Foundation 2010) (*http://technet.microsoft.com/library/120e011b-43c2-4165-82fe-52877c2d259b(Office.14).aspx*).

Concepts

Plan for RBS (SharePoint Foundation 2010)

Other Resources

Downloadable book: Upgrading to SharePoint Foundation 2010 (*http://go.microsoft.com/fwlink/?LinkId=196159*)

Resource Center: Upgrade and Migration for SharePoint Foundation 2010 (*http://technet.microsoft.com/en-us/sharepoint/ee517215.aspx*)

Set a content database to use RBS (SharePoint Server 2010)

Published: May 12, 2010

This article describes how to set a content database to use Remote BLOB Storage (RBS). Its instructions assume that you have already installed RBS for use with Microsoft SharePoint Foundation 2010. To install and configure RBS, see Install and configure Remote BLOB Storage or External BLOB Storage (SharePoint Server) (*http://technet.microsoft.com/library/4cf30b48-f908-4774-920c-d2f2916f2c1b(Office.14).aspx*).

Set a content database to use RBS

To set a content database to use RBS, you must provision a binary large object (BLOB) store in SQL Server, add the content database information to the RBS configuration on a Web server, and then test the RBS data store.

These instructions assume that you have installed SQL Server Management Studio on the database server. If this is not the case, you can download and install Management Studio from Microsoft SQL Server 2008 Management Studio Express (*http://go.microsoft.com/fwlink/?LinkID=186132&clcid=0x409).* You can perform the following procedures on any Web server or application server in the farm. However, for simplicity in this article, we refer to this server as a Web server.

 Note:

These instructions assume that you are using the FILESTREAM RBS provider. If you are using a different RBS provider, refer to that provider's instructions to perform these operations.

To set a content database to use RBS

1. Verify that the user account that you use to perform this procedure is a member of the Administrators group on the Web server, and is a member of the SQL Server **dbcreator** and **securityadmin** fixed server roles on the computer that is running Microsoft SQL Server 2008 R2, SQL Server 2008 with Service Pack 1 (SP1) and Cumulative Update 2, or SQL Server 2005 with SP3 and Cumulative Update 3.

2. Click **Start**, click **All Programs**, click **Microsoft SQL Server 2008**, and then click **SQL Server Management Studio**.

3. In the **Connect to Server** dialog box, specify the server type, server name, and authentication method of the database server that you want to connect to, and then click **Connect**.

4. Expand **Databases**.

5. Right-click the content database for which you want to create a BLOB store, and then click **New Query**.

6. In the **Query** pane, copy and execute the following SQL queries in the sequence that is provided.

   use *[ContentDbName]*
   if not exists (select * from sys.symmetric_keys where name =
   N'##MS_DatabaseMasterKey##')
   create master key encryption by password = N'Admin Key Password !2#4'

   use *[ContentDbName]*
   if not exists (select groupname from sysfilegroups where
   groupname=N'RBSFilestreamProvider')
   alter database *[ContentDbName]* add filegroup RBSFilestreamProvider contains
   filestream

   use *[ContentDbName]*
   alter database *[ContentDbName]* add file (name = RBSFilestreamFile, filename =
   'c:\RBSStore') to filegroup RBSFilestreamProvider

   Where *[ContentDbName]* is the content database name and *c:\RBSStore* is the volume\directory that will contain the RBS data store. Be aware that you can provision a RBS store only one time. If you attempt to provision the same RBS data store multiple times, you will receive an error.

   💡 **Tip:**

   For best performance, simplified troubleshooting, and as a general best practice, we recommend that you create the RBS data store on a volume that does not contain the operating system, paging files, database data, log files, or the tempdb file.

7. Click **Start**, click **Run**, type **cmd** into the **Run** text box, and then click **OK**.

8. Copy and paste the following command at the command prompt:

   msiexec /qn /i rbs.msi REMOTEBLOBENABLE=1
   FILESTREAMPROVIDERENABLE=1 DBNAME=<*ContentDbName*>
   FILESTREAMSTORENAME=FilestreamProvider_1
   ADDLOCAL=EnableRBS,FilestreamRunScript DBINSTANCE=<*DBInstanceName*>>

   Where <*ContentDbName*> is the name of the content database, and <*DBInstanceName*> is the name of the SQL Server instance. The operation should finish within approximately one minute.

To test the RBS data store

1. Connect to a document library on any Web server.

2. Upload a file that is at least 100 kilobytes (KB) to the document library.

3. On the computer that contains the RBS data store, click **Start**, and then click **Computer**.

4. Navigate to the RBS data store directory.

5. Locate the folder that has the most recent modification date, other than the $FSLOG folder. Open this folder and locate the file that has the most recent modification date. Verify that this file has the same size and contents as the file that you uploaded. If does not, ensure that RBS is installed and enabled correctly.

Concepts

[Migrate content into or out of RBS (SharePoint Server 2010)](#)

Other Resources

[Overview of BLOB Storage (SharePoint Server 2010)](#)
(*http://technet.microsoft.com/library/d359cdaa-0ebd-4c59-8fc5-002cba241b18(Office.14).aspx*)

Migrate content into or out of RBS (SharePoint Server 2010)

Published: May 12, 2010

This article describes how to migrate content into or out of Remote BLOB Storage (RBS), or to a different RBS provider.

After installing RBS and setting a content database to use RBS, all existing content in that database can be migrated into the database's active provider. You use the same Windows PowerShell 2.0 command to migrate content into or out of RBS, or to another RBS provider. When RBS is implemented, SQL Server itself is regarded as an RBS provider.

You can migrate content databases at any time, but we recommend that you perform migrations during low usage periods so that this activity does not cause performance degradation for users. Migration moves all content from the specified content database into the storage mechanism of the newly named provider.

This operation can be performed on any Web server in the farm. You only need to perform the operation one time on one Web server for each content database that you want to migrate.

To migrate a content database by using Windows PowerShell

1. Verify that you meet the following minimum requirements: See **Add-SPShellAdmin**.
2. On the **Start** menu, click **All Programs**.
3. Click **Microsoft SharePoint 2010 Products**.
4. Click **SharePoint 2010 Management Shell**.
5. At the Windows PowerShell command prompt, type the commands in the following steps.
6. To obtain the content database RBS settings object:

   $cdb=Get-SPContentDatabase *<ContentDbName>*
   $rbs=$cdb.RemoteBlobStorageSettings

   Where *<ContentDbName>* is the name of the content database.

7. To view a list of all RBS providers that are installed on the Web server:

   $rbs.GetProviderNames()

8. To set the active RBS provider:

   $rbs.SetActiveProviderName(*<NewProvider>***)**

   Where *<NewProvider>* is the name of the provider that you want to make active for this content database. If you want to migrate the content database out of RBS altogether and back into SQL Server inline storage, set this value to ()

9. Migrate the data from RBS to the new provider or to SQL Server:

   $rbs.Migrate()

Concepts

Set a content database to use RBS (SharePoint Server 2010)

Disable RBS on a content database (SharePoint Server 2010)

Published: May 12, 2010

You can disable Remote BLOB Storage (RBS) on any content database. After you disable RBS on a content database, binary large objects (BLOBs) are stored inline in SQL Server for all subsequent writes to the content database. This article describes how to disable RBS on a content database.

You can disable RBS on a content database by setting the active provider name to the empty string in Windows PowerShell. Each content database has a **RemoteBlobStorageSettings** property that can be used to invoke the **SetActiveProviderName** method.

This action does not change the storage location of any BLOBs that have previously been stored in RBS or inline storage. Disabling RBS does not uninstall RBS. We do not recommend that you uninstall RBS.

This operation can be performed on any Web server in the farm. You only need to perform the operation one time on one Web server for each content database for which you want to disable RBS.

⚠️ **Caution:**

Do not use the **Disable()** method on the **RemoteBlobStorageSettings** object. This method is used only to uninstall RBS, and it is not recommended to simply disable the writing of new BLOBs into RBS.

You must use Windows PowerShell 2.0 cmdlets to disable RBS. There is no user interface option for this task.

To disable RBS by using Windows PowerShell

1. Verify that you meet the following minimum requirements: See **Add-SPShellAdmin**.
2. On the **Start** menu, click **All Programs**.
3. Click **Microsoft SharePoint 2010 Products**.
4. Click **SharePoint 2010 Management Shell**.
5. At the Windows PowerShell command prompt, type the following commands:

   $site=Get-SPSite "_<http://yourSiteURL>_**"**
   $rbss=$site.ContentDatabase.RemoteBlobStorageSettings
   $rbss.SetActiveProviderName("")

   Where _<http://yourSiteURL>_ is the Web application that is attached to the content database that is being disabled for RBS.

For more information, see [Get-SPSite](http://technet.microsoft.com/library/f3422bf4-0f9b-4f22-94c8-2a0606a31b16(Office.14).aspx) (_http://technet.microsoft.com/library/f3422bf4-0f9b-4f22-94c8-2a0606a31b16(Office.14).aspx_).

Maintain RBS (SharePoint Foundation 2010)

Published: August 27, 2010

The maintenance tasks associated with Remote BLOB Storage (RBS) are mainly performed through the RBS Maintainer. The RBS Maintainer performs periodic garbage collection and other maintenance tasks for an RBS deployment. You can schedule these tasks for each database that uses RBS by using Windows Task Scheduler or Microsoft SQL Server Agent. The RBS Maintainer must be provisioned through command-line parameters or through an XML file. In the case of mirrored or replicated databases, the Maintainer should be run against any single instance.

In this article:

- [Garbage collection](#)
- [RBS and BLOB store consistency checks](#)
- [Running the RBS Maintainer](#)

Garbage collection

Garbage collection is how unreferenced or deleted data is removed from the remote BLOB store. Garbage collection in RBS is performed passively. References to BLOBs are counted by looking at the list of BLOB IDs stored by the application in its RBS table columns at the time of garbage collection.

Any BLOB references that are present in the RBS auxiliary tables but absent in any RBS column in application tables are assumed to be deleted by the application and will be collected as garbage. BLOBs that are not present in any RBS column and were created before the Orphan Cleanup Time Window, described later in this article, are also assumed to be deleted by the application and will be collected as garbage.

Because passive garbage collection tabulates BLOB references from the RBS columns of an application's tables, every RBS column must have a valid index before it can be registered in RBS.

This garbage collection is performed by the RBS Maintainer tool. It should be scheduled to run at non-busy times to reduce the effect on regular database operations.

RBS garbage collection is performed in the following three steps:

- Reference scan. The first step compares the contents of the application's RBS tables with RBS's own internal tables and determines which BLOBs are no longer referenced. Any unreferenced BLOBs are marked for deletion.

- Delete propagation. The next step determines which BLOBs have been marked for deletion for a period of time longer than the garbage_collection_time_window value and deletes them from the BLOB store.
- Orphan cleanup. The final step determines whether any BLOBs are present in the BLOB store but absent in the RBS tables. These orphaned BLOBs are then deleted.

Configuring RBS garbage collection

Garbage collection can be configured by adjusting several Maintainer and database settings. The Maintainer settings are as follows:

- Maintainer schedule. This setting determines how often the Maintainer will be executed.
- Task Duration. This setting determines the maximum length that a single Maintainer execution can run. The default setting is two hours.

These Maintainer settings should be configured so that the Maintainer activity has minimal effect on regular activity. The database garbage collection settings are described in Running RBS Maintainer (*http://go.microsoft.com/fwlink/?LinkId=199638*).

RBS and BLOB store consistency checks

The RBS Maintainer verifies the integrity of RBS BLOB references and corrects any errors that are found. It performs several consistency checks for the database, such as verifying that indexes exist for the RBS columns, and verifying that all BLOBs that are referenced by application tables exist in RBS.

The Auxiliary Table Consistency Check verifies that the RBS auxiliary tables are in a consistent state by performing the following checks:

- Verifies that each RBS table column has a valid index.
- Verifies that registered-applications RBS table columns exist; have enabled, valid indexes; and have the correct column type.

The following consistency checks are optional and can be omitted:

- Verifies that all BLOBs that are referenced in the application tables are present in the RBS tables.
- Verifies that no BLOBs are marked as both in use and deleted.

Any discovered problems will be logged and the RBS Maintainer will attempt to fix them by creating missing index entries, unregistering missing columns, or marking in-use BLOBs as not deleted.

Running the RBS Maintainer

RBS requires you to define a connection string to each database that uses RBS before you run the Maintainer. This string is stored in a configuration file in the *<installation path>*\Microsoft SQL Remote Blob Storage 10.50\Maintainer folder that is ordinarily created during installation.

The Maintainer can be run manually by executing the
Microsoft.Data.SqlRemoteBlobs.Maintainer.exe program together with the following
parameters:

Parameter name	Description	Values	Required
ConnectionStringName *<string name>*	The name of the connection string for the configuration file.	*RBSMaintainerConnection* is the default name that is created during RBS setup.	Yes.
Operation *<space-separated list of operations to perform>*	The garbage collection operations to perform. This parameter takes between one and four arguments. The *ForceFinalize* value cannot be used in combination with any other operation.	*ConsistencyCheck* *GarbageCollection* *Maintenance* *ConsistencyCheckForStores* *ForceFinalize*	Yes.
GarbageCollectionPhases *<phases>*	The garbage collection phases to perform. This parameter is used to run or complete the garbage collection. The value must be one or more letters without spaces.	*r* — Reference scan. *d* — Delete propagation. *o* — Orphan cleanup.	Yes, if garbage collection is to be performed.
ConsistencyCheckMode *<c, r, or b>*	Specifies the type of consistency check to be performed.	*c* — Only a check will be performed. *r* — A check will be performed and any issues found will be repaired. *b* — A check, repair, and rebuild of the internal data structures.	Yes, if a consistency check is to be performed.

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Parameter name	Description	Values	Required
ConsistencyCheckExtent *<m or c>*	Specifies the extent of the consistency check.	*m* — Only metadata will be checked; individual BLOBs will remain unchecked. This is the default parameter. *c* — A complete check will be performed.	If not specified, *m* is assumed.
ConsistencyCheckForStores *<space-separated list of BLOB store names>*	Lists the names of the BLOB stores that will be checked for consistency.	By default, all BLOB stores are checked.	No.
TimeLimit *<time in minutes>*	Specifies the time that is available for the Maintainer to perform its tasks. The argument must be a positive integer.		No.

A separate RBS Maintainer task must be scheduled for every database that uses RBS. The following steps describe how to schedule a Maintainer task.

To schedule a Maintainer task

1. Add a connection string to the *<RBS installation directory>*\Maintainer\Microsoft.Data.SqlRemoteBlobs.Maintainer.exe.config file for the Maintainer task that is to be performed. The RBS installer creates one connection string that is named RBSMaintainerConnection by using the connection information that was provided during setup. However, new connection strings must be added for every additional database.

   The RBS Maintainer connection strings are stored in an encrypted format. Therefore, to add connection strings, either the new strings must be encrypted or all the connection strings must be decrypted. Encrypted strings must be added one at a time, but all the connection strings can be decrypted at the same time by using the %windir%\Microsoft.net\Framework*<version>*\Aspnet_regiis.exe tool, which is distributed as a part of the Microsoft .NET Framework.

   When you run the following commands, the connection strings will be decrypted and the results will be stored in a Web.config file.

   rename Microsoft.Data.SqlRemoteBlobs.Maintainer.exe.config web.config

   aspnet_regiis -pdf connectionStrings

Strings can then be added in decrypted form and the file can be encrypted and renamed to Microsoft.Data.SqlRemoteBlobs.Maintainer.exe.config by using the following commands:

aspnet_regiis -pef connectionStrings . -prov DataProtectionConfigurationProvider

rename web.config Microsoft.Data.SqlRemoteBlobs.Maintainer.exe.config

2. Create a Windows scheduler task to execute the Maintainer task for each applicable database. If the RBS installer was run in GUI mode, it will automatically create a Maintainer task. However, if it was run in command-line mode, then the following steps must be performed every time that a new Maintainer task is scheduled:

   a) Run the Task Scheduler in **Administrative Tools**.

   b) On the **Action** menu, click **Create Task**.

   c) On the **Actions** tab, click **New**, and then in the **Action** drop-down list, select **Start a program**.

   d) Under **Settings**, in the **Program/script** box, browse to the Maintainer binary file *<RBS installation directory>*\Maintainer\Microsoft.Data.SqlRemoteBlobs.Maintainer.exe, and in the **Add arguments (optional)** text box, add any optional arguments. The following default values are created by the installer:

      <-ConnectionStringName RBSMaintainerConnection>

      <-Operation GarbageCollection ConsistencyCheck ConsistencyCheckForStores>

      <-GarbageCollectionPhases rdo>

      <-ConsistencyCheckMode r>

      <-TimeLimit 120>

   e) On the **Triggers** tab, click **New**, and then schedule the task. We recommend that the task be scheduled during low system activity times.

   f) On the **General** tab, under **Security**, ensure that you have the permission to run the task. Click **Change User or Group** if you must change your permission.

   g) On the **General** tab, click **Run whether user is logged on or not**, and then click **OK**.

Concepts

Overview of RBS (SharePoint Foundation 2010)
Plan for RBS (SharePoint Foundation 2010)
Install and configure RBS with the FILESTREAM provider (SharePoint Foundation 2010)
Install and configure RBS without the FILESTREAM provider (SharePoint Foundation 2010)

Other Resources

Upgrading from a stand-alone installation of Windows SharePoint Services 3.0 to SharePoint Foundation 2010 when content databases exceed 4 GB (RBS)

Set a content database to use Remote Blob Storage (RBS) (SharePoint Foundation 2010) (*http://technet.microsoft.com/library/64c80191-b6bd-44a8-a044-830f60d9191a(Office.14).aspx*)

Migrate content into or out of Remote BLOB Storage (RBS) (SharePoint Foundation 2010) (*http://technet.microsoft.com/library/8a5f834b-cac3-4bdc-b7cb-2247f5f3b2eb(Office.14).aspx*)

Disable Remote BLOB Storage (RBS) on a content database (SharePoint Foundation 2010) (*http://technet.microsoft.com/library/f9f562cd-0974-4a89-a23f-c34b1ff3412e(Office.14).aspx*)