

BackupAssist SQL Add-on



WHITEPAPER
BackupAssist Version 5
www.BackupAssist.com

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1. Requirements

1. BackupAssist V4.x.x or later
2. Windows 2000, XP or 2003 Server
3. Microsoft SQL Server 2000, 2005, 2005 Express, 2000 MSDE

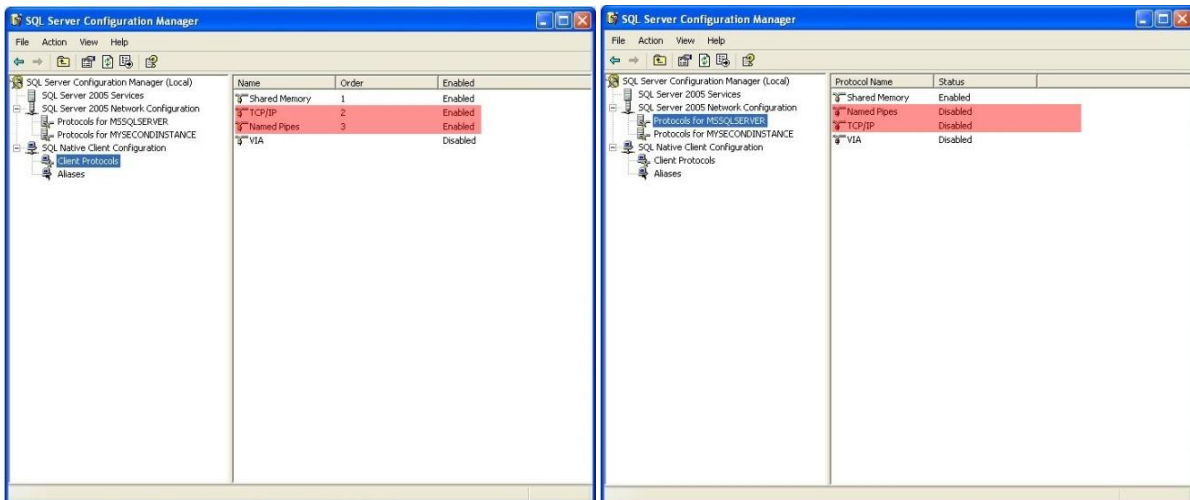
Note: - If you wish to backup MSDE databases, BackupAssist should be installed on the actual MSDE machine itself.

1.1 Remote SQL backup requirements:

To remotely backup an SQL Server you will need to ensure that you SQL server can accept remote TCP/IP connections.

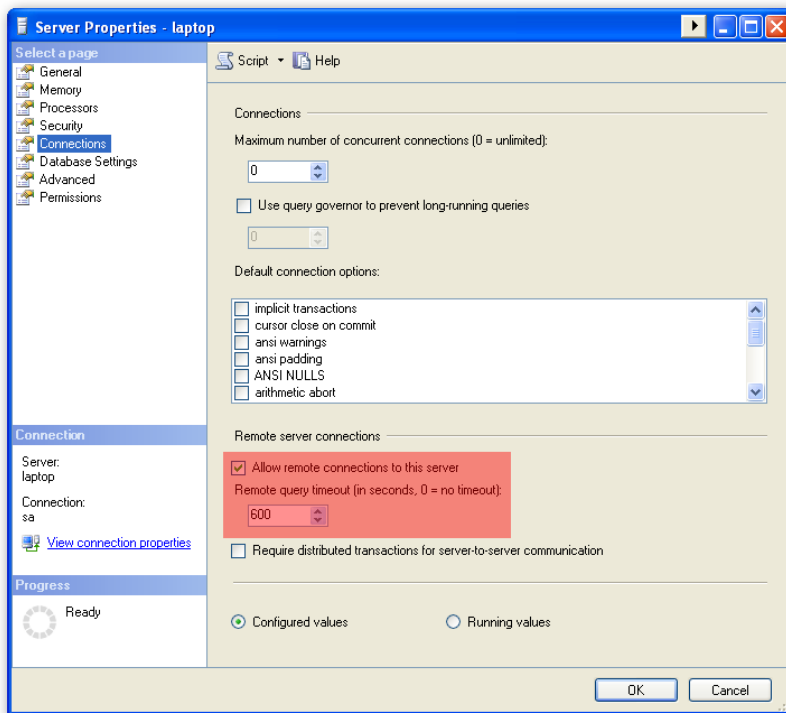
To use the TCP/IP connection option in SQL Server you will need to enable these protocols on the client and server configuration of the SQL Server Configuration Manager. This can be found under (Start > All Programs > SQL Server > SQL Server Configuration Manager).

You will need to enable TPC/IP and Named Pipes for both Client protocols and Protocols for MSSQLSERVER (see in red below).



You will then need to enable remote connections on your SQL Server.

This setting can be found in your SQL Server's Enterprise Manager, under the properties of the server. You will need to enable the "Allow remote connections to this server" found under "Connections".



After completing these two steps your SQL Server is prepared to receive remote connections from BackupAssist.

2. Introduction

BackupAssist includes a specific backup engine that is specifically designed to allow users to backup / restore their SQL databases.

Using the SQL engine, BackupAssist can perform live, online backups of your SQL Server databases and include these backups in your overall backup job (together with your files, system state, and/or Exchange server).

SQL Server backups are stored in the standard SQL Server Backup Format (.bak file format) , which means that meaning that you can perform a restoration of your entire SQL Server on any machine, without needing any additional software.

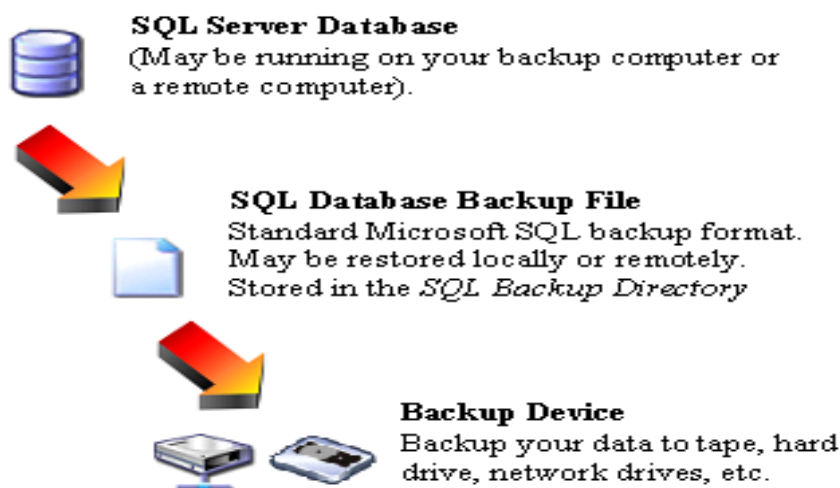
The SQL engine also allows users to restore their databases to a different SQL server.

Key features of the BackupAssist SQL Server Addon Module:

- Backs up individual SQL Server databases
- Captures a "live snapshot" of your databases, which means the SQL Server can be running during the backup
- Performs T-log backups of your SQL databases for specific point-in-time restoration of databases.
- Restore an entire SQL server or individual databases using the built-in SQL Restore utility.
- Backup local and remote SQL Server databases

3. SQL backups within BackupAssist

BackupAssist will login to your SQL server and perform a backup of the databases in the .bak file format. This file is then transferred to your backup device (tape, hard drive, network server, etc).



This design gives you maximum flexibility when you need to do a restoration, because your SQL server does not need access to the backup device. All you need to restore database is the SQL database Backup File (in the .bak file format). With the SQL Database Backup File, you can also perform advanced operations like recovery using the SQL Server transaction logs for point-in-time restorations.

The recommended best practice is to backup both your System and User databases of your SQL server.

3.1 Backing up system databases:

The system databases need to be backed up just as user databases are backed up. This allows the system to be rebuilt in the event of system or database failure, for example, if a hard disk fails.

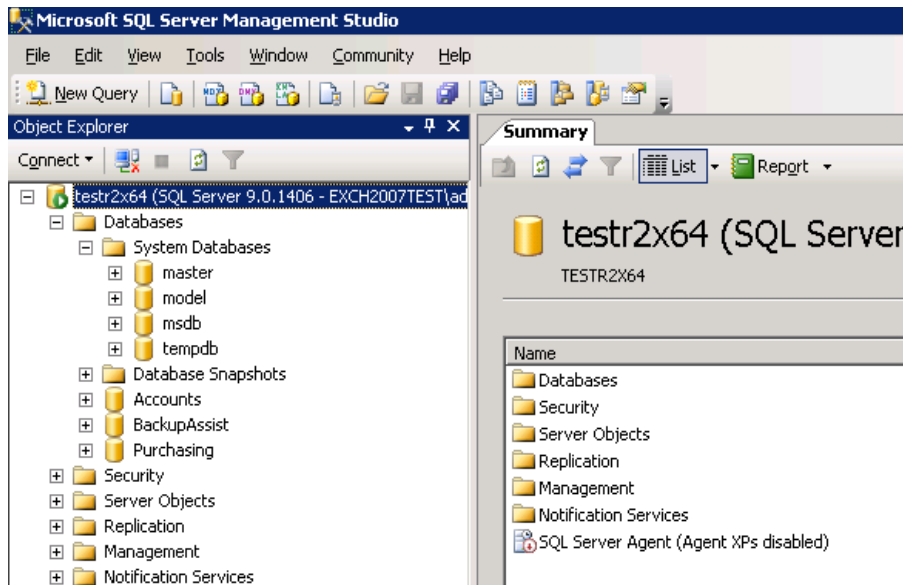
For example, the system databases in **SQL Server 2005** are: **master**, **msdb**, **model**, **tempdb**, and **resource**.

System Databases	
Master	<p>Records all the system-level information for an instance of SQL Server. The master database is composed of important system tables and catalogs and is critical to your SQL server. If you are restoring your SQL server after a disaster or new installation, it is advised that you restore the master database before restoring any other database</p> <p>The restore utility within BackupAssist can be used to restore all other databases remotely but not the master database. If you need to restore the master database to a remote SQL server you should install BackupAssist on the remote server itself.</p>
MsdB	<p>Used by the SQL server agent for scheduling alerts and jobs.</p> <p>The msdb database is used to store data, including scheduled job information, backup and restore history information and DTS packages (data transmission services).</p> <p>Usually the msdb database generally remains rather small, and therefore full database backups provide a fast alternative to transaction log backups for this database.</p>
Model	<p>Used as a template for all databases created on the instance of SQL server. Any changes made to the Model database are applied to any database created afterward.</p> <p>The model database is a template, used by Microsoft SQL Server when creating other databases, such as tempdb or user databases. When a new database is created, the entire contents of the model database are copied to the new database. Back up the model database if you modify it, to include the default configuration for all new user databases. If the master or msdb databases are rebuilt, the model database is also rebuilt and therefore changes are lost.</p>
Resource	<p>Is a read-only database that contains system objects that are included with SQL server 2005.</p> <p>The Resource database makes upgrading to a new version of SQL Server an easier and faster procedure. In earlier versions of SQL Server, upgrading required dropping and creating system objects. Because the Resource database file contains all system objects, an upgrade is now accomplished simply by copying the single Resource database file to the local server. Similarly, rolling back system object changes in a service pack only requires overwriting the current version of the Resource database with the older version.</p>
Tempdb	<p>Is a workspace for holding temporary objects or intermediate results sets.</p> <p>It is important to have regular backups of these system databases, however, it is not necessary to back up the tempdb system database because it is rebuilt each time SQL Server is started. When SQL Server is shut down, any data in tempdb is deleted permanently. For this reason, do not store any application specific data in the tempdb database. Leave it exclusively for use by SQL Server.</p>

Note: Only full database backups of master can be performed. Transactional log, differential or filegroup backups of master are not allowed. Thus if you create a Database Maintenance Plan for all the system databases or if you select the master database and you select the Back up the transaction log as part of the maintenance plan option, the backup transaction log step for the master database will fail.

3.2 Backing up user databases:

User databases should be backed up on a regular basis. Also, it needs to be performed after a new database or index is created and when certain non-logged operations are executed.



From the above example, you can see that some of the User databases are:- Accounts, BackupAssist, Purchasing, etc.

4. Transactional Logs Backups

T-log Backups of SQL server databases is only possible if the databases are configured using the Full or Bulk Logged recovery models option. For additional in-depth information on SQL database recovery models, please refer: - <http://msdn.microsoft.com/en-us/library/ms175477.aspx> .

SQL server utilizes a transaction log to track all of the modifications performed within a database. This log ensures both that the database is able to recover when abruptly interrupted (such as a loss of power) and that users are able to undo (or 'rollback' in database lingo) the results of a database transaction.

Each time the transaction log is backed up, SQL Server removes all of the committed transactions in the log and writes them to the backup media. Due to this incremental process, transaction logs are not cumulative and you must maintain a complete set of transaction logs reaching back to the most recent full or differential backup.

Every SQL Server database has a transaction log that records all transactions and the database modifications made by each transaction. The transaction log is a critical component of the database and, if there is a system failure, the transaction log might be required to bring your database back to a consistent state. The transaction log should never be deleted or moved unless you fully understand the ramifications of doing this.

4.1 Operations Supported by the Transaction Log

The transaction log supports the following operations:

- Recovery of individual transactions.

- Recovery of all incomplete transactions when SQL Server is started.
- Rolling a restored database, file, file group, or page forward to the point of failure.
- Supporting transactional replication.
- Supporting standby-server solutions.

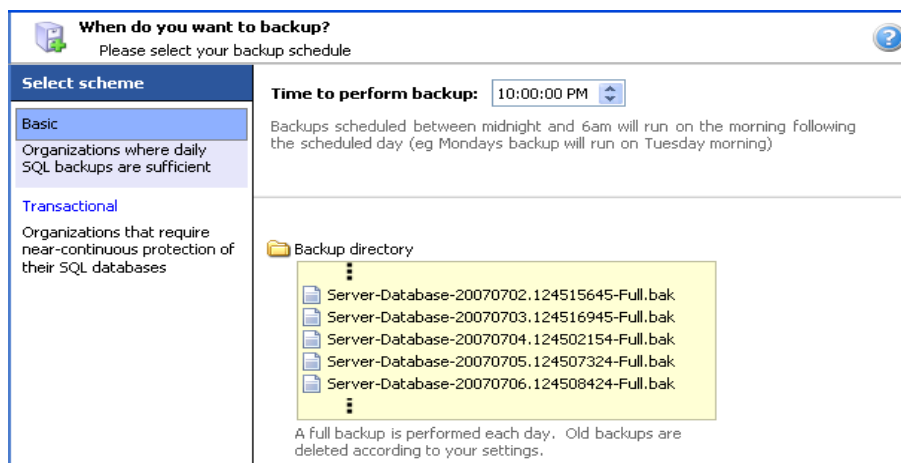
For more information on each of the above listed points, please refer:- <http://msdn.microsoft.com/en-us/library/ms190925.aspx> .

Note:- BackupAssist support both Full backups as well as Transactional backups of the SQL server databases.

5. Configuring SQL database backups

- I. First of all, you need to choose whether you wish to perform “FULL backups” or “Transactional backups” of your SQL databases. SQL backups configured in an NTbackup Method job will only perform full backups of SQL databases. To perform transaction log backups of your SQL databases, you need to create a SQL Method backup job

Note: - You can only perform full backups of your MASTER database.



- II. Here you can specify the destination directory where you wish to store the SQL backup files. The database backup works by logging into the SQL server and performing a database backup to file (in the .back file format).

You can also use variable names built into BackupAssist to differential the database backup files.

SQL Directory settings

Set up your SQL Directory

Directory path: ...

This directory should be empty, and used only for SQL backups

- III. You can then add as many SQL servers for backup as required, and each can be configured separately.

Note: - you can use either the ip address or the SQL server name to connect to the SQL databases.

Add an SQL server (additional servers can be added later)

Server:

Databases: Select all (new databases will also be selected)

<input checked="" type="checkbox"/> master
<input checked="" type="checkbox"/> model
<input checked="" type="checkbox"/> msdb
<input checked="" type="checkbox"/> ReportServer
<input checked="" type="checkbox"/> ReportServerTempDB
<input checked="" type="checkbox"/> testDB

- IV. The wizard will then guide you through rest of the steps where you can name this SQL backup job and setup email notifications.

6. Restoring Databases

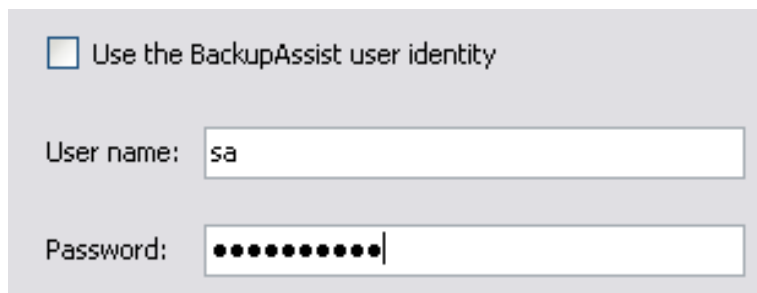
BackupAssist provides an inbuilt SQL Restore Utility that can be used to restore SQL databases to both local and remote SQL Servers. In addition, you can restore databases to a specific point in time provided that you have a transaction log backup of the database.

While you do need to have BackupAssist installed to use the restore utility, it does not have to be a licensed installation of the software. In addition, if the trial expires you can still access the utility by running SQLRestore.exe from the BackupAssist installation directory.

6.1 Accessing the SQL Restore Utility

1. Click **Restore** in the navigation bar.
2. Click **SQL restore**.
 - Alternatively, run **SQLRestore.exe** from the directory where BackupAssist was installed.
3. The *SQL Restore Utility* will launch and attempt to detect for both local and remote SQL servers that can be restored to.
 - **Local server:** select the local server you wish to restore to from the list of detected servers.
 - Note: If the SQL server you wish to restore to is not running or 'stopped', click **Attempt to start**. Any servers that cannot be started may indicate a fault with the server itself. You can only restore to SQL servers that are running. Consult your system administrator if any SQL servers will not start.
 - **Remote server:** select the **Restore a remote server** radio button and choose a server from the drop-down list.
 - Note: if the remote server you want to restore to is not in the list or no remote servers were detected you can type the server's name or IP address directly into the field.

4. Click **next** and BackupAssist will attempt to connect to the SQL server using the BackupAssist user identity credentials.
 - Note: if BackupAssist is unable to authenticate to the server you will be asked to input a valid username and password. If the SQL server you are restoring to only accepts SQL authentication or requires a different Windows user uncheck **Use the BackupAssist user identity** and input a valid username and password.



Use the BackupAssist user identity

User name:

Password:

5. Select a restore type.
 - Note: multiple restore types can be selected. The master database is restored first before selected databases.

6.2 Master database recovery

BackupAssist provides a utility for restoring the master database to a local SQL server in just a few simple steps. The master database is composed of important system tables and catalogs and is critical to your SQL server. If you are restoring your SQL server after a disaster or new installation, it is advised that you restore the master database before restoring any other database.

The restore utility can be used to restore all other databases remotely but not the master database. If you need to restore the master database to a remote SQL server you should install BackupAssist on the remote server itself. The installation does not need to be licensed to use the utility and you can even run **SQLRestore.exe** from the BackupAssist installation directory if the trial has expired.

To restore the master database:

1. Click **Restore** in the navigation bar.
2. Click **SQL restore**
 - Alternatively, you can run **SQLRestore.exe** from the directory where BackupAssist was installed.
3. Choose the SQL server instance you wish to restore to from the list of local servers detected.
4. Check **Master database recovery**
 - Note: if you want to restore additional databases as well as the master check **Selected databases** as well. The master database will be restored before all other databases.

Select restore type:

Master database recovery

Restore you master database. This is required if the databases have been deleted or added, or if the master database file is missing or corrupt.

Selected databases:

This allows you to restore the databases within an SQL server to any point in time for which you have backups.

5. Specify the path where the master database backup file resides (in .BAK format) either by typing it directly in the **Add directories containing backups** field or by browsing for it.
6. Click **Add** if the path was entered manually. You can add as many directories as you like. BackupAssist will search each directory added and determine which master database backups are available to restore from in date order.

Add directories containing backups:

<input type="text"/>	<input type="button" value="Browse..."/>	<input type="button" value="Add"/>
D:\backups\sqlwed C:\sqltest		<input type="button" value="Remove"/>

Backups for server SBS2003R2 have been found.

7. Select the master database backup you want to restore from the list at the bottom of the window and click **Next**.

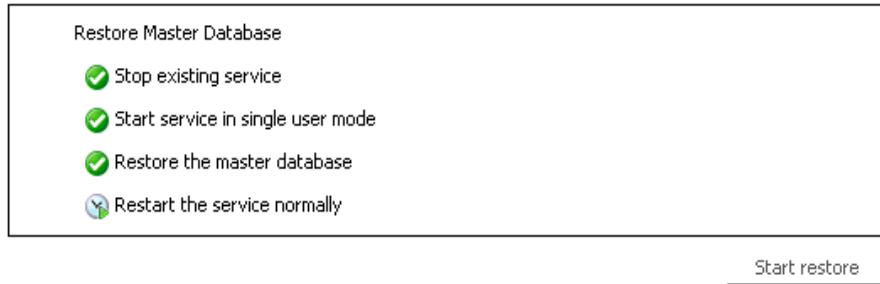
Add directories containing backups:

<input type="text" value="C:\sqltest2\"/>	<input type="button" value="Browse..."/>	<input type="button" value="Add"/>
C:\sqltest		

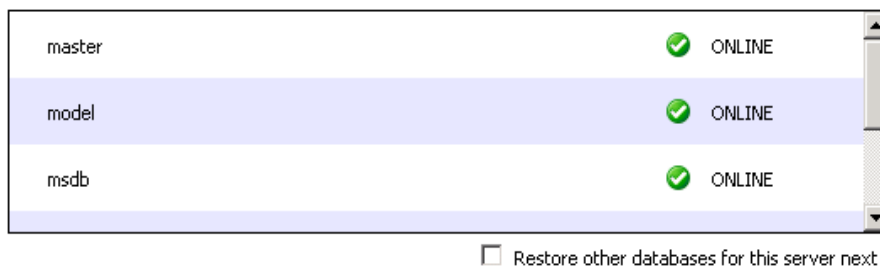
Select the master database backup you wish to restore:

9/10/2007 3:27:27 PM - SBS2003R2
9/10/2007 3:42:17 PM - SBS2003R2

8. Click **Start restore** to the right of the window to restore the master database from the backup specified in the previous step. A list of steps is displayed that indicate the status of the restoration process. As the SQL service is stopped during the restore you should only perform this operation on an SQL Server that is not being accessed.



9. Once the master database restore is complete the list of databases at the bottom of the window is updated and should indicate that all databases are online. The SQL server can now continue with normal operations.



10. If any databases are listed as not being online (suspect or corrupt), or if you simply want to restore additional databases check **Restore other databases for this server next** at the bottom of the window; otherwise, click **Finish**.

7. Restoring selected SQL databases

BackupAssist provides a utility for restoring one or more SQL databases to either a local or remote SQL server in just a few simple steps. The utility also lets you restore a SQL database to a specific point in time, provided you have a transaction log backup to restore from.

The databases you wish to restore must already exist on the SQL server; if they do not you can either choose to use the *SQL Restore Utility* to restore the master database first, which will result in recreating all databases on the server, or you can manually recreate each database you wish to restore. If you are restoring your SQL server after a disaster or new installation, it is advised that you restore the master database before restoring any other database.

7.1 To restore one or more databases:

- a. Click **Restore** in the navigation bar.
- b. Click **SQL restore**.
- c. Choose the SQL server instance you wish to restore to from either the list of local or remote servers detected.
- d. Check **Selected databases**

- o **Note:** checking this option will not let you restore the master database. if you want to restore the master database check **Master database recovery** as well. The master database will be restored before other databases
- e. Specify the path where the database backup files reside (in .BAK format) either by typing it directly in the **Add directories containing backup's** field or by browsing for it.
 - o Note: this is typically the SQL directory used in your BackupAssist backup job. Each database backup created is stored in the SQL directory in .BAK format (a separate file for each database) before being copied to the backup destination (tape drive, external hdd, REV drive, etc). If the backup files for your databases are not available you may need to first restore them from your backup media using NTBackup.
- f. Click **Add** if the path was entered manually. You can add as many directories as you like. BackupAssist will search each directory added and determine if there are database backups that can be restored from

Add directories containing backups:

C:\sqltest2\

C:\sqltest

Select the master database backup you wish to restore:

9/10/2007 3:27:27 PM - SBS2003R2
 9/10/2007 3:42:17 PM - SBS2003R2

- g. Click **Next** and you will be presented with a list of databases that can be restored using the SQL backup files specified in the previous step. The list may take time to generate depending on the number of backup files.

Select a restore time for all databases: 15/05/2007 22:48:37 PM

Databases to restore	Nearest available time:	
<input checked="" type="checkbox"/> STS_WSSConfig	<input checked="" type="checkbox"/> 15/05/2007 17:00:06 PM	<input type="button" value="Set restore time..."/>
<input checked="" type="checkbox"/> pubs	<input checked="" type="checkbox"/> 16/05/2007 19:00:06 PM	<input type="button" value="Set restore time..."/>
<input checked="" type="checkbox"/> Northwind	<input type="checkbox"/> 15/05/2007 19:00:06 PM	<input type="button" value="Set restore time..."/>
<input type="checkbox"/> msdb	<input type="checkbox"/> 15/05/2007 19:00:05 PM	<input type="button" value="Set restore time..."/>

Could not find an exact match for the restore time
 The selected point in time is available for restore

- h. Check each database in the list that you wish to restore.
- i. To restore all databases to the same point in time, specify the time in the **Restore time** drop-down menu and click **Search**.

- If the restore time specified is not available from the supplied backup files, a **warning** icon will appear to the right of the database and the nearest available time to that specified that the database can be restored to will be indicated.
- If the restore time selected is available, a **success** icon will appear to the right of the database.

j. If you wish to specify a different restore time for each database individually, click **Set restore time** to the right of the appropriate database:

Select a date:

May 2007						
Mon	Tue	Wed	Thu	Fri	Sat	Sun
30	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31	1	2	3
4	5	6	7	8	9	10
Today: 16/05/2007						

Select a time range:

Northwind on POLLINI, from 12:05 PM to 7:00 PM

Select a time from within that range:

5:04:15 PM

- 1) The available dates that the database can be restored to appear in **bold** on the calendar. Select one of these dates from the calendar.
- 2) A list of time ranges will appear in the **Select a time range** box. You can restore the database to any point in time between any of the time ranges listed.
- 3) Select a time range from the list and input a specific point in time to restore the database to in the **Select a time from within that range** field.

Once you have set the restore times for all databases you wish to restore click **Next**.

Click **Start restore** to the right of the window to restore all databases selected. Click **Next** once the restore process completes.

Future transaction log backups cannot be used to restore a database to a specific point in time until a full backup runs so it is recommended that you now run a full backup of the databases that were restored. Click **Start full backup**. Full backups of these databases will be stored in the same folder as the backup files you just restored from.

test3
test4

Start full backup

Only select this checkbox if you are certain that you will not need to restore to any point between now and your next full backup.

Skip full backup

- If your backup schedule already includes a **full** backup as the next SQL backup and you are certain you will not need to restore these databases to a specific point in time between the restoration and the next full backup you can check **Skip full backup** and click **Finish**.

For some additional information regarding recovering your SQL databases to a certain point in time and creation of multiple recovery points, please refer the following article on the Microsoft Knowledge base:- <http://msdn.microsoft.com/en-us/library/ms175078.aspx> .

References

- http://searchsqlserver.techtarget.com/tip/0,289483,sid87_gci1307822,00.html?asrc=SS_CLA_301326&psrc=CLT_87 – Tips for scheduling and testing SQL server backups.
 - http://vyaskn.tripod.com/sql_server_administration_best_practices.htm - SQL system databases explanations.
 - <http://msdn.microsoft.com/en-us/library/ms175078.aspx> - MSDN knowledge base on recovery paths.
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