SPHOL207: Database Snapshots with SharePoint 2013

Hands-On Lab
Lab Manual
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Hands-on Lab  Database Snapshots with SharePoint 2013

Database Snapshots with SharePoint 2013

Estimated time to complete this lab: 40 minutes

Lab Objectives

The goal for this Hands-On-Lab (HOL) is a tour of how to create and use SharePoint 2013 database snapshots. You will start with creating a database snapshot using SQL Server Management Studio 2012. You will then create another database snapshot using Windows PowerShell. You will then use the Object Explorer in the SQL Server Management Studio to view the database snapshots. Next, you will select and edit the site collection residing in the content database to simulate a site modification. You will then use the database snapshots you created to restore the database using SQL queries, drop the deprecated database snapshot, and create a new database snapshot of the restored content.

After completing this HOL, you will be better able to:

- Use Windows PowerShell and SQL Server Management Studio to create and manage database snapshots of crucial site content.
- Create a database snapshot of a SharePoint 2013 server
- View and edit the content database using a database snapshot
- Export and restore content from the a SharePoint database snapshot

Technologies

- Windows PowerShell, SQL Server Management Studio 2012, SharePoint Server 2013

Audience

- SharePoint Site Collection Administrators and SharePoint IT Professionals

Scenario

This lab takes you through a scenario where a database snapshot is needed to restore a previous version of the database due to changes made by a user that corrupted the SharePoint Database. Afterwards, the snapshot will be deleted, and a new database snapshot will be taken once the restoration of the SharePoint database is complete.

Overview

Database snapshots provide read-only, static views of a source database as it existed at the time of the database snapshot's creation. Snapshots can be used for reporting purposes, and in the event of a user error on a source database, you can revert the source database to the state it was in when the snapshot was created.
Data loss is confined to updates or changes to the database made after the database snapshot's creation. Creating a database snapshot can be useful immediately before making a major change to a database, such as changing the schema or the structure of a table.

A word of caution, however – database snapshots do not help if you're dealing with a corrupted database. If the database itself is corrupted, or the database snapshot used to restore the database is of the database in a corrupted state, it won't fix the problem.

Therefore, it's a good idea to make sure you use more than one database backup strategy to maintain your SharePoint Server farm and sites. Database snapshots are a useful tool, but they're only one part of keeping a comprehensive database backup strategy to keep your SharePoint sites running.

**Getting Started**

**Connect to the Lab Environment**

If not already logged on, log on to the SharePoint (SP) virtual machine (VM) as Administrator, with the credentials username CONTOSO\Administrator, and password pass@word1.

After you have logged on to the VM, start Internet Explorer, navigate to the demo home page at http://hrweb.contoso.com/http://intranet.contoso.com/, and log into SharePoint as Administrator with the following credentials:

**Username:** CONTOSO\Administrator

**Password:** pass@word1
Exercise 1 - Creating Database Snapshots with SQL Server Management Studio 2012 and Windows PowerShell

In this section of the lab, you will create a database snapshot (using either SQL Server Management Studio 2012 or Windows PowerShell) and save it to the network backup share location. Then you will view and confirm that the database snapshot exists, using the Object Explorer function in the SQL Server Management Studio.

Task 1 - Creating a Database Snapshot with SQL Server Management Studio 2012

In this task, you will use Transact-SQL in SQL Server Management Studio 2012 to create a new database snapshot on a SharePoint Foundation content database. To do this, you’ll be using the AS SNAPSHOT OF clause in the CREATE DATABASE statement.

1. Open the SQL Server Management Studio. Click Start, then click All Programs, then click Microsoft SQL Server 2012, and then click SQL Server Management Studio.

2. Click Connect on the Object Explorer toolbar, and click the type of server to connect to. The Connect to Server dialog box appears.

3. In the Server Name box, type the name of your SQL Server instance, and click Connect.

4. Find the database you want to take a snapshot of, and make a copy of its database name.

5. To find the database name, you can open the Content Databases page in SharePoint 2013 Central Administration. To do this, click Start, then click All Programs, then click Microsoft SharePoint 2013 Products, and click SharePoint 2013 Central Administration.
6. From the main page, under the Application Management header, click the Manage content databases heading, and find the Database Name you want to snapshot. If the database name is not displayed, ensure that the Web Application is set to http://hrweb.contoso.com/

7. In SQL Server Management Studio 2012, find the database name you want to snapshot. In this case, the database to snapshot is named WSS_Content_3232a26c0ff645d5a2600a48727dbf5d.

8. Open a new Code Editor window by right-clicking the server name in Object Explorer, and clicking New Query.

Note: The database defaults to the master database name. To open a Code Editor window using a specific database, right-click the specific database name, and then click New Query.
9. In the **Code Editor** window of the SQL Server Management Studio, issue a **CREATE DATABASE** statement on the files using the **AS SNAPSHOT OF** clause:

```sql
USE MASTER
CREATE DATABASE WSS_Content_3232a26c0ff645d5a2600a48727dbf5d_Snapshot ON
    ( Name = WSS_Content_3232a26c0ff645d5a2600a48727dbf5d, FILENAME = 'C:\Program Files\Microsoft SQL Server\MSSQL11.MSSQLSERVER\MSSQL\Data\WSS_Content_3232a26c0ff645d5a2600a48727dbf5d.snap' )
AS SNAPSHOT OF WSS_Content_3232a26c0ff645d5a2600a48727dbf5d;
GO
```

10. When you’ve finished entering the **CREATE DATABASE** statement in the Code Editor window, go to the **Object Explorer** toolbar and click **Execute**. If the query is successful, you will see **Command completed successfully** in the **Messages** tab.

11. Check the **C:\Program Files\Microsoft SQL Server\MSSQL11.MSSQLSERVER\MSSQL\DATA** directory to make sure that a file named “WSS_Content_3232a26c0ff645d5a2600a48727dbf5d.snap” is located in the directory. To do this, in the Object Explorer, right-click the **Database Snapshots** folder and select **Refresh**.
12. You should now see the snapshot listed in the **Database Snapshots** folder in the **Object Explorer**.

Task 2 – Creating a Database Snapshot using Windows PowerShell (optional)

Windows PowerShell can also be used to create a database snapshot. This can be useful if you’re working with Windows PowerShell to create scripts or automate database snapshots for multiple servers.

This is because all database snapshots created in **Windows PowerShell** automatically generate date/timestamps that are appended to the snapshot’s name. **SQL Server Management Studio 2012** database snapshots do not automatically generate a time/date stamp unless specifically requested.

1. To create a database snapshot using the **Microsoft SharePoint 2013 Management Shell**, switch from SQL Server Management Studio window and launch the **Microsoft SharePoint 2013 Management Shell**. Click **Start**, then click **Microsoft SharePoint 2013 Products**, and then click **SharePoint 2013 Management Shell**.

2. In the Microsoft SharePoint 2013 Management Shell, type the following command and press **ENTER**:

   ```powershell
   $ContentDb = Get-SPContentDatabase WSS_Content_3232a26c0ff645d5a2600a48727dbf5d
   $ContentDb.Snapshots.CreateSnapshot()
   ```
3. Optionally, to return the name of the snapshots, type the following command and press ENTER:

```
$ContentDb.Snapshots | Select Name
```

4. Now you need to confirm that the database snapshot you created using Windows PowerShell exists. To do this, open SQL Server Management Studio 2012. In the Object Explorer, select Database Snapshots, right-click, and select Refresh. The new database snapshot should appear in the folder under Database Snapshots.

By completing Exercise 1, you learned how to:

- Find the Database ID of the content database for a specific SharePoint site
- Take a Database Snapshot of the content database using SQL Server Management Studio 2012;
- Take a Database Snapshot of the content database using Windows PowerShell.

These are important concepts to maintain a content database snapshot library. This exercise also provided you with the basic PowerShell database snapshot commands that can be integrated into a PowerShell script. You can use the PowerShell database snapshot to automatically snapshot a content database that is often changed, or use the basic SQL Server Management Studio snapshot features to create database snapshots before making any substantial changes to a SharePoint Site.
Exercise 2 - Restoring and Changing SharePoint Server Content using Database Snapshots with PowerShell

In this exercise, you'll use one of the database snapshots that you created in Exercise 1 to restore the SharePoint Server content. First, you'll modify the SharePoint Server content to show the changes made in your SharePoint site. Then you'll use SQL Server Management Studio to restore your site from the SQL Server snapshot you took in Exercise 1. Finally, you'll delete the old database snapshot to make way for a new database snapshot.

In this scenario, a user has moved data from a crucial team site to a new site and deleted the original site, losing some crucial content. Now you need to restore the site from the database snapshot, export the database content, restore the content and delete the old database snapshot.

Task 1 – Modify the SharePoint Server Content

For the purposes of this lab, you need to simulate the change made on your SharePoint Server Content. To do this, you'll delete the Changes sub-site of the SharePoint site on http://hrweb.contoso.com/teamsite/.

2. In the sidebar, click Site Contents.
3. In the Site Contents page, click Settings.
4. Under Site Actions, click **Delete this site**.

5. A confirmation page will appear asking you to confirm the site **Delete**. Click the **Delete** button.

**Note:** After completing this task, browsing to [http://hrweb.contoso.com/teamsite/changes](http://hrweb.contoso.com/teamsite/changes) should return a **HTTP 404 Not Found** error, but you should still be able to browse to [http://hrweb.contoso.com/teamsite/](http://hrweb.contoso.com/teamsite/).
Task 2 – Restore the Database using a Database Snapshot from the SQL Server Management Studio

Now you need to restore the database content from the database snapshot you created in Exercise 1. To do this, you'll make sure you are currently in the MASTER database in SQL Server Management Studio. You'll then drop any other database snapshots from the Database Snapshots folder using the Object Explorer. You will then create a SQL Query that sets the database to MASTER, terminates all user connections from the database, restore the database in SQL Server Management Studio 2012, and drop the old database from the server.

1. In Microsoft SQL Server Management Studio 2012, create a new query. In the drop-down menu next to the Execute button, select master from the list of databases to make sure you're working from the master database.

   **Note:** The code sample used in this task should automatically set the database used to master, but to be safe, make sure that the selected database shows as master in the drop down menu.

2. In Microsoft SQL Server Management Studio 2012, in the Object Explorer, find the Database Snapshots folder, and find the database snapshot you want to use to restore the database.

3. Delete all other snapshots in the Database Snapshot folder. Right-click each database snapshot name, and select Delete.

   **Note:** If you don't delete all other snapshots from the database snapshot folder, the restore query will not complete. Make sure to remove all snapshots EXCEPT the one you want to use to restore your database.
4. In the **Code Editor** window of the SQL Server Management Studio, issue a **RESTORE DATABASE** statement on the files using the **FROM SNAPSHOT** clause, and click **Execute**.

```sql
USE master
ALTER DATABASE WSS_Content_3232a26c0ff645d5a2600a48727dbf5d SET READ_ONLY WITH ROLLBACK IMMEDIATE
ALTER DATABASE WSS_Content_3232a26c0ff645d5a2600a48727dbf5d SET READ_WRITE WITH ROLLBACK IMMEDIATE
RESTORE DATABASE WSS_Content_3232a26c0ff645d5a2600a48727dbf5d FROM DATABASE_SNAPSHOT = 'WSS_Content_3232a26c0ff645d5a2600a48727dbf5d_snapshot';
GO
```

**Note:** You need to make sure nobody is using or making changes to the content database being restored before executing this query. The **ALTER DATABASE** SQL command automatically terminates all connections to the database, making it possible to execute the restore operation on the database.

5. Verify that the snapshot has been restored. Open **http://hrweb.contoso.com/teamsite/changes** in a browser window and verify that the changes made to the SharePoint site have been reverted.
Task 3: Drop the Database Snapshot in SQL Server Management Studio

In this task, you will drop the previously created database snapshot to make room for a new database snapshot, and then take a new database snapshot of the restored database. You can do this by using the DROP DATABASE command in SQL Server Management Studio, and by combining the DROP DATABASE command with the same CREATE DATABASE command used in Exercise 1.

You can drop a database snapshot using a SQL query, or by finding the snapshot to delete from the Object Explorer in SQL Server Management Studio.

1. To drop the snapshot with a SQL statement, open a new query and enter:

   ```sql
   USE master
   DROP DATABASE [WSS_Content_3232a26c0ff645d5a2600a48727dbf5d_snapshot]
   GO
   ```

2. Click Execute.

3. The database snapshot no longer appears under the Database Snapshots folder in Object Explorer.

You may want to use a DROP DATABASE command that automatically creates a new database snapshot when you drop the deprecated database snapshot. To do this, just add the CREATE DATABASE query you used in Exercise 1 to create a new database snapshot after the DROP DATABASE statement.
4. To automatically create a new database snapshot after dropping the deprecated database snapshot, this, open a new query and enter the following statement:

```sql
USE master
DROP DATABASE [WSS_Content_3232a26c0ff645d5a2600a48727dbf5d_snapshot]
CREATE DATABASE WSS_Content_3232a26c0ff645d5a2600a48727dbf5d_snapshot ON
    ( Name = WSS_Content_3232a26c0ff645d5a2600a48727dbf5d_snapshot, FILENAME = 'C:\Program Files\Microsoft SQL Server\MSSQL11.MSSQLSERVER\MSSQL\Data\WSS_Content_3232a26c0ff645d5a2600a48727dbf5d_snap.' )
AS SNAPSHOT OF WSS_Content_3232a26c0ff645d5a2600a48727dbf5d;
GO
```

5. The database snapshot used previously to restore the content of the database is automatically been deleted, and a new database snapshot is taken of the restored database content. To confirm, select the database snapshot you are dropping. Right-click the database snapshot, and select Properties. The Date Created field should show a different timestamp than the previous database snapshot.

6. To delete the snapshot from the Object Explorer, expand Databases, then Database Snapshots in the Object Explorer file tree. Select the database snapshot, and click Delete. Right-click the Database Snapshots folder and select Refresh. The Object Explorer should no longer show the database under Database Snapshots.
Task 4 - Optional: Merging the Database Restore, Drop and Create Database queries

By now it should be obvious you can use the three queries in Exercise 2 in a single SQL Server Management Studio query to automatically restore a database, drop the deprecated snapshot, and create a new database snapshot without creating three separate queries for each task.

1. To merge the RESTORE, DROP, and CREATE queries to do this, enter the following commands into a new query, and click **Execute**.

```
USE master

ALTER DATABASE WSS_Content_3232a26c0ff645d5a2600a48727dbf5d SET READ_ONLY WITH ROLLBACK IMMEDIATE

ALTER DATABASE WSS_Content_3232a26c0ff645d5a2600a48727dbf5d SET READ_WRITE WITH ROLLBACK IMMEDIATE
```
The query shows a new snapshot with a modified **Date Created** timestamp.

By completing Exercise 2, you first simulated the destruction of your SharePoint site by a user. Then you learned how to:

- Use the database snapshot you created using either SQL Server Management Studio or Windows PowerShell to restore the database to a previous version in time
- Drop the deprecated database from the Database Snapshots folder in SQL Server Management Studio
- Use a merged DROP DATABASE and CREATE DATABASE command to combine the deletion of a deprecated database with the creation of a new one
- Use a merged RESTORE, DROP, and CREATE DATABASE query to combine the restoration task into a single SQL query.
Summary

In this Hands-on-Lab (HOL), you learned how to create, manage, and delete SharePoint 2013 database snapshots using the SharePoint 2013 Management Shell and the SharePoint SQL Server Management Studio. You should be able to use the tools and skills learned in this HOL to effectively manage, create, and delete database snapshots and use them to restore SharePoint Servers in the event of database failure.

For more information about database snapshots in SharePoint 2013, see also: