DAT247x

Managing Database Operations

Lab 01 | Automating SQL Server Management

Estimated time to complete this lab is 60 minutes

Overview

You are a database administrator (DBA) at Adventure Works Cycles, with responsibility for databases on an instance of SQL Server. Routine tasks that must be performed on this instance have previously been performed manually, but you now plan to automate these tasks using SQL Server Agent.

The labs in this course are accumulative. You cannot complete the following labs if this lab has not been successfully completed.

What You'll Need

To complete this lab, you will need the following:

- High-speed and reliable internet connectivity (for remote connections to the VM)
- A second monitor is recommended (for the Remote Desktop connection)
- A Microsoft account (such as one used for outlook.com, Hotmail, or other Microsoft services)
- A Microsoft Azure subscription
- To have completed the previous labs in this course.

Exercise 1: Create a SQL Server Agent Job

The **AdventureWorks** database must be backed up every day. Additionally, after the backup has been created, the backup file must be copied to a folder, which is automatically replicated to a cloud service for offsite storage of various backup files.

The main tasks for this exercise are as follows:

1. Configure SQL Server Agent
2. Create a backup job

Configure SQL Server Agent

1. Create the **backup** and **labs** folders.

2. Switch to super user mode and create the directory /var/opt/mssql/agent/backup in Linux.

   a. Go to the Azure Portal.

   b. Click on your Linux virtual machine from the dashboard and click **Connect**.

   c. Copy the ssh command by clicking **Copy**.

d. At the top of the portal, click Cloud Shell.

e. When the Cloud Shell has connected, type your password if requested and press Enter.

f. Paste the ssh command that you copied and press Enter.

g. Type `sudo mkdir /var/opt/mssql/agent` and press Enter.
h. If requested, type your password and press Enter.

i. Type `sudo mkdir /var/opt/mssql/agent/backup` and press Enter.

j. If requested, type your password and press Enter.

k. Type `sudo mkdir /var/opt/mssql/agent/labs` and press Enter.

l. If requested, type your password and press Enter.

m. Change ownership with the following commands:
```
sudo chown mssql:mssql /var/opt/mssql/agent/backup
sudo chown mssql:mssql /var/opt/mssql/agent/labs
```

n. If requested, type your password and press Enter.

o. Give write access to the folder to the owner with the following command:
```
sudo chmod 777 /var/opt/mssql/agent/backup
sudo chmod 777 /var/opt/mssql/agent/labs
```

p. If requested, type your password and press Enter.

3. Enable SQL Server Agent

   a. Type the following commands and press Enter:
   ```
   sudo /opt/mssql/bin/mssql-conf set sqlagent.enabled true
   sudo systemctl restart mssql-server
   ```

   b. If requested, type your password and press Enter.

4. Start SQL Operations Studio, right-click your server, and click **New Query**.

5. Run the following Transact-SQL to ensure that Agent XPs are enabled:
```
EXEC SP_CONFIGURE 'show advanced options',1
GO
RECONFIGURE
GO
EXEC SP_CONFIGURE 'Agent XPs',1
GO
RECONFIGURE
GO
```

Create a Backup Job

1. Run the following Transact-SQL to add a new job called **Backup AdventureWorks**:

```
USE msdb ;
GO
```

```
EXEC dbo.sp_add_job @job_name = N'Backup AdventureWorks',
@enabled=1,
@owner_login_name=N'sa' ;
GO
```
2. Assign the job to a target server:

```
EXEC dbo.sp_add_jobserver
    @job_name = N'Backup AdventureWorks',
    @server_name = N'Insert Server Name Here';
GO
```
NOTE: If you do not know the server name, run the command
`SELECT @@SERVERNAME`
3. Add a job step to perform the backup command:

```
USE msdb ;
GO
EXEC msdb.dbo.sp_add_jobstep @job_name=N'Backup AdventureWorks',
@step_name=N'1',
            @step_id=1,
            @cmdexec_success_code=0,
            @on_success_action=1,
            @on_fail_action=2,
            @retry_attempts=0,
            @retry_interval=0,
            @os_run_priority=0, @subsystem=N'TSQL',
            @command=N'BACKUP DATABASE [AdventureWorks2016] TO  DISK =
N''/var/opt/mssql/backup/AdventureWorks.bak'' WITH NOFORMAT, NOINIT,
NAME = N''AdventureWorks2016-Full Database Backup'', SKIP, NOREWIND,
NOUNLOAD,  STATS = 10
     GO',
            @database_name=N'master',
            @flags=0
GO
EXEC msdb.dbo.sp_update_job @job_name=N'Backup AdventureWorks',
            @enabled=1
                GO
```

Test the Backup Job

1. Run the following Transact-SQL to run the job:
```
USE msdb;
GO
EXEC dbo.sp_start_job N'Backup AdventureWorks';
GO
```

Exercise 3: Schedule a Job

Add a Schedule to the Job

1. Run the following Transact-SQL to add a daily schedule to the job:

```
USE msdb;
GO
EXEC msdb.dbo.sp_add_jobschedule @job_name=N'Backup AdventureWorks',
@name=N'Daily Backup',
            @enabled=1,
            @freq_type=4,
            @freq_interval=1,
            @freq_subday_type=1,
            @freq_subday_interval=0,
            @freq_relative_interval=0,
            @freq_recurrence_factor=1,
            @active_start_date=20180510,
            @active_end_date=99991231,
            @active_start_time=0,
            @active_end_time=235959
```

Verify Scheduled Job Execution

1. Run the following Transact-SQL to view job information:

```
USE msdb;
GO
EXEC dbo.sp_help_jobactivity;
GO
```

> **Lab Check –** *You will need these answers for the module quiz –*
> *write them down!*
>
>
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>
> Which field reports the next time that the job will run?
>
> _____

You have now completed the lab.

If you are not immediately continuing with the next lab, you should complete the
*Finishing Up exercise to shut down and stop the VM.*

Finishing Up

In this exercise, you will shut down and stop the VMs.

1. Deallocate the Linux VM by clicking **Stop**.

   Deallocation will take some minutes to complete, and also extends the time required to restart the VM. Consider deallocating the VM if you want to reduce costs, or if you choose to complete the next lab after an extended period.
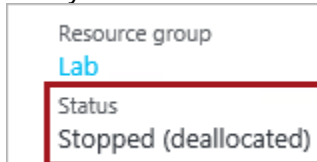

2. When prompted to stop the VM, click **Yes**.
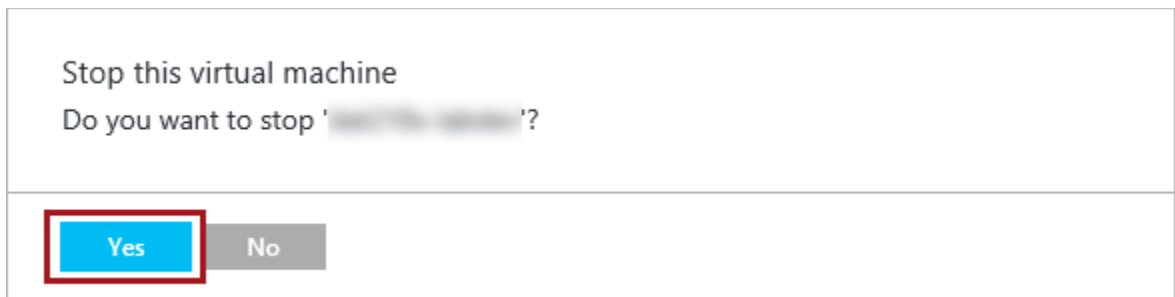
   The deallocation can take several minutes to complete.

3. Verify that the VM status updates to **Stopped (Deallocated)**.

   In this state, the VM is now not billable—except for a relatively smaller storage cost.
   Note that a deallocated VM will likely acquire a different IP address the next time it is started.