



WHITE PAPER >

**Protecting and Restoring a
VMware vCenter Server Virtual Machine with
STORServer Virtual Machine Backup**

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Introduction

This white paper explains how to properly protect a VMware® vCenter Server that is running on a virtual machine by using STORServer® Virtual Machine Backup (VMB). It includes instructions for backing up vCenter Server and its Microsoft® SQL database, and restoring both when necessary.

STORServer VMB allows you to back up and archive VMware virtual machines to your IBM Spectrum Protect™ server on a STORServer Appliance or in an existing IBM Spectrum Protect environment. STORServer VMB supports the use of two different backup technologies: the VMB Native backup technology, which was developed by STORServer based on the VMware Virtual Disk Development Kit (VDDK), and VMB Spectrum, which uses IBM Spectrum Protect for Virtual Environments: Data Protection for VMware. When backing up typical virtual machine clients, customers may choose the backup technology that meets their backup requirements. When backing up a virtual machine that is running vCenter Server, the use of VMB Native backup technology is required, as explained further in the next section.

Backing up the vCenter Server machine

There are two basic requirements for ensuring the most efficient backup (and eventual restore) of the vCenter Server machine using STORServer VMB:

- Use of the VMB Native backup technology and changed block tracking (CBT) to perform full machine backups of the vCenter Server machine
- An established backup regimen for backing up the vCenter Server SQL database

Configuring STORServer VMB to back up the vCenter Server machine

To ensure that the VMB Native backup technology and CBT are used for all backups of the vCenter Server virtual machine, configure these options at the client level. Client properties override the application-wide default backup technology settings in STORServer VMB.

To configure STORServer VMB to back up the vCenter Server machine on a daily basis:

1. On the **Clients** tab of the STORServer VMB user interface, double-click the vCenter Server client machine to open the **Client Information** dialog box.
2. Verify that CBT is enabled, and **Use VMB Native** is selected under **Backup Technology Options**.
3. Add the vCenter Server client to a daily backup schedule. (See the STORServer VMB Help for instructions.) A daily frequency should be adequate for all but the most heavily used systems.

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Protecting the vCenter Server SQL database

Depending upon your environment, the vCenter Server SQL database may require more protection than that provided by the VMware snapshot and CBT techniques used by STORServer VMB. If the vCenter Server database is located on a different machine than vCenter Server and is already protected by an existing backup regimen, then no additional steps are necessary.

However, if the SQL database resides on the vCenter Server machine, you must take steps to ensure that the database is backed up in a consistent manner. The goal is to have a backup copy of the database that was created just prior to the virtual machine backup performed by STORServer VMB. That way, the database backup is in synch with the vCenter Server backup. One method for accomplishing this is presented in the section SQL Express backup strategy on page 7.

Restoring the vCenter Server virtual machine

You can restore the vCenter Server machine by connecting STORServer VMB directly to the ESX/ESXi host where the machine will be restored, disassociating that host from vCenter Server, and then executing the Restore Virtual Machine operation in STORServer VMB. You can choose whether to replace the existing vCenter Server machine or create a new one (side-by-side).

NOTE! Do not attempt to run both the restored vCenter Server machine and a previous instantiation of the vCenter Server machine at the same time.

Connecting STORServer VMB to the appropriate ESX/ESXi host

By default, STORServer VMB connects to vCenter Server using the properties that are defined in settings. However, during a restore, the vCenter Server may be unavailable. In that case, you need to reconfigure STORServer VMB to connect directly to the ESX/ESXi host on which you want to restore the vCenter Server virtual machine. You may need to provide different user name and password credentials when connecting directly to the ESX/ESXi host, as they may differ from those specified for the vCenter Server machine.

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To configure STORServer VMB to connect directly to the appropriate ESX/ESXi host:

1. Click **Settings | Edit Settings**.
2. Modify the vCenter Server values to reflect those of the target ESX/ESXi host. The following example configures STORServer VMB to connect to an ESX/ESXi host called sscloud13:

The screenshot shows the 'STORServer Virtual Machine Backup Settings' dialog box with the 'vCenter Server' tab selected. The dialog is titled 'Identify vCenter server or ESX/ESXi host.' and contains the following fields:

- vCenter Server or ESX/ESXi Host**
 - * Address:
 - Port number:
 - * Web service:
 - Port number:
- Login Credentials**
 - * User name:
 - * Password:
 - Re-enter password:

3. Update the logon credentials if necessary and click **OK**.
4. To verify connectivity, click the **Clients** tab from the main STORServer VMB window. A list of the virtual machines on the specified host should appear.

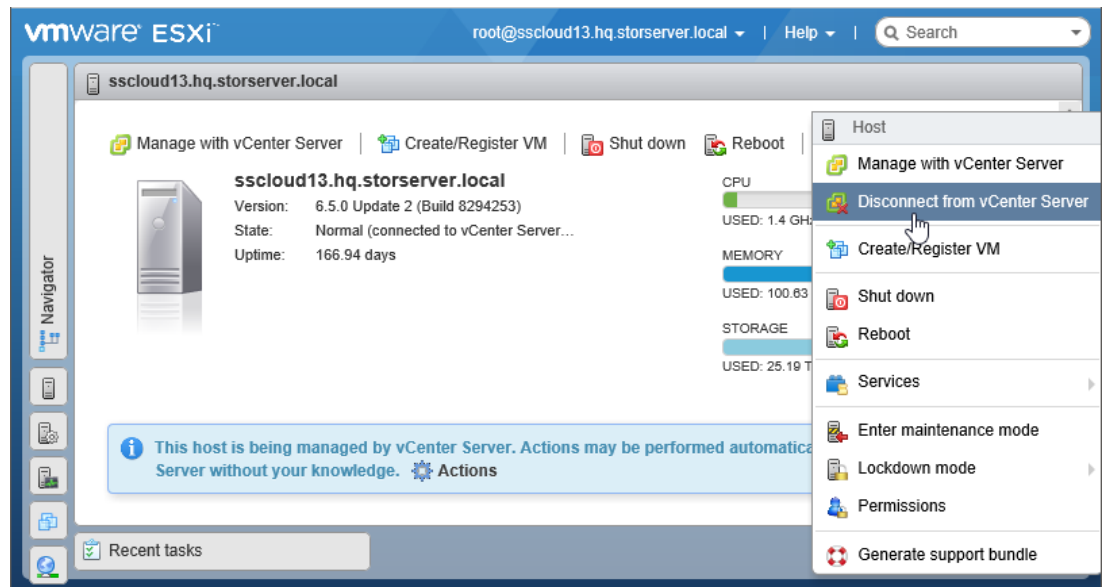
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Disconnecting the ESX/ESXi host from vCenter Server

Because vCenter Server is not available during the restore, it cannot be used to control virtual machine creation and data transfer, which are required during the restore process. Therefore, you must disconnect the ESX/ESXi host from vCenter Server. Otherwise, the restore process will fail with an error message from VMware indicating that the desired operations cannot be performed while this ESX/ESXi host is managed by the vCenter Server.

To disconnect the ESX/ESXi host from vCenter Server:

1. Open the VMware vSphere Client and connect to the ESX/ESXi host.
2. On the initial screen click **Actions** and select **Disconnect from vCenter Server**.



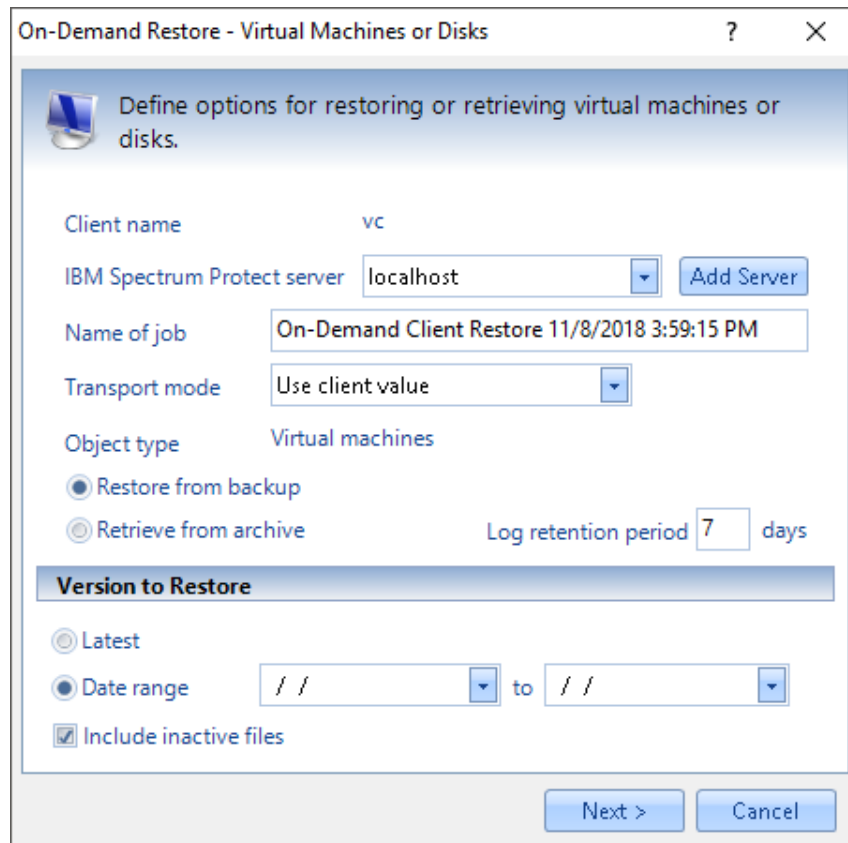
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Restoring the vCenter Server virtual machine

After connecting STORServer VMB to the ESX/ESXi host where you want to restore the vCenter Server machine, and disconnecting the ESX/ESXi host from vCenter Server (see previous sections), you are ready to restore the vCenter Server machine.

To restore the vCenter Server virtual machine using STORServer VMB:

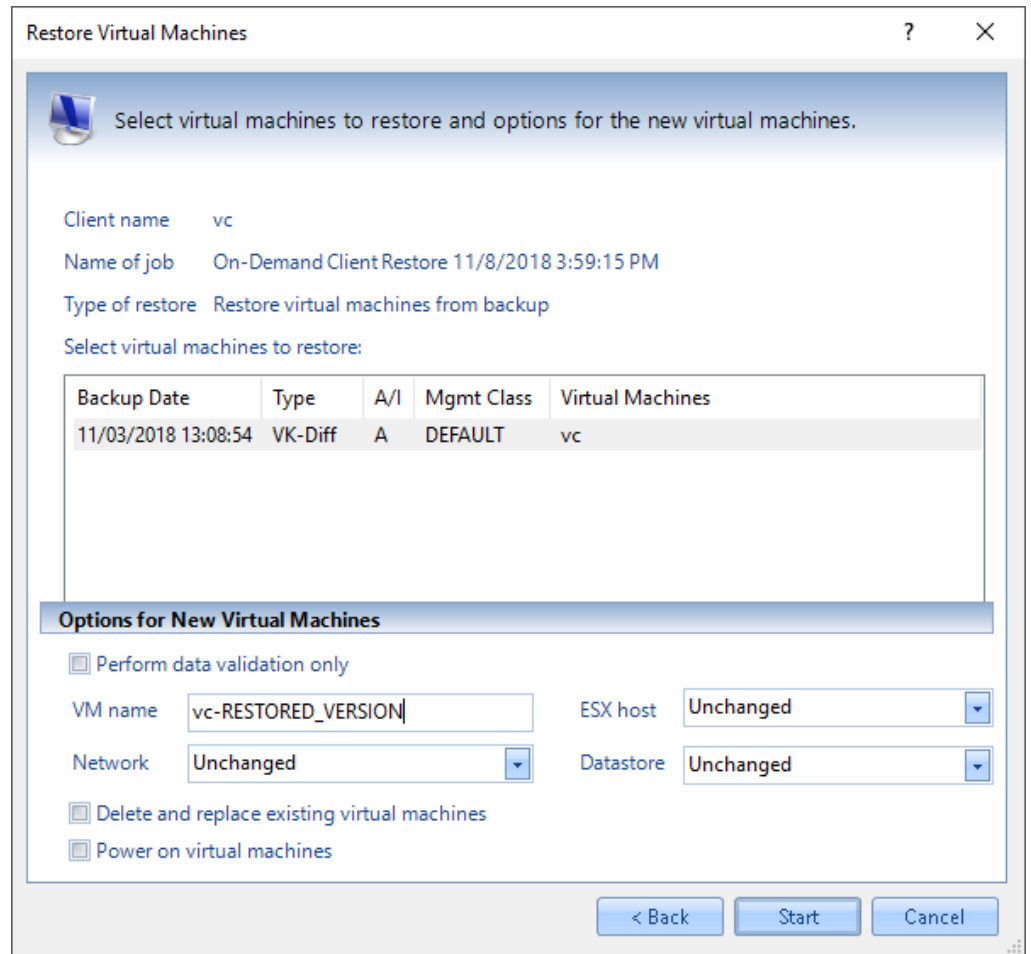
1. On the **Clients** tab select the vCenter Server virtual machine that you want to restore.
2. Right-click the selected client and click **Restore | Restore Virtual Machines**.



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- Click **Next**, select the backup that you want to restore, and set any additional options, such as **VM name**, **Network**, or **Datastore**. (Press F1 for more details.)

NOTE! Leave the **ESX host** setting as **Unchanged**.



- Click **Start** to begin the restore.

Once the virtual machine is restored, it will automatically start if you selected the **Power on virtual machines** option. Otherwise, you can start it manually from the vSphere Client.

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(Optional) Restoring the vCenter Server database

If you have a backup copy of the vCenter server database, you can restore it by logging on to the newly recovered vCenter Server machine and using SQL to restore the database.

The following sample commands (wrapped due to format restrictions) restore a database backup that resides in C:\VimDb:

```
C:\> osql -E -S .\VIM_SQLEXP -E -d master
1> restore database VIM_VCDB from disk='C:\VimDb\VIM_VCDB.BAK'
    with replace
2> go
```

Once the restore of the vCenter Server database is complete, reconnect the ESX/ESXi host with the newly restored vCenter Server machine.

SQL Express backup strategy

To ensure that the vCenter Server's SQL database is backed up in a consistent manner, you need to create a backup copy of the database just prior to backing up the vCenter Server machine with STORServer VMB. This section describes a method for accomplishing this using Microsoft SQL Express, which is the default database available for use with vCenter Server. It explains how to obtain an online SQL backup of the vCenter Server database, which is then backed up by STORServer VMB during the full machine backup of the vCenter Server machine.

You can perform an online SQL backup of the vCenter Server database using two simple scripts:

- A SQL database script to create the backup copy
- A Windows CMD script

The Microsoft Windows Task Scheduler can automate execution of the scripts.

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To create these scripts and configure the Windows Task Scheduler to automate their execution:

NOTE! This procedure was verified using Microsoft SQL Express 2008 R2.

1. Using a text editor such as Notepad, create a file called BACKUP_VIMDB.SQL in a permanent directory on the vCenter Server machine. Add the following entries to the file.

NOTE! Although the BACKUP DATABASE command appears on multiple lines here, due to format restrictions, enter the entire command on a single line.

```
BACKUP DATABASE [VIM_VCDB] to
    disk=N'C:\VimDb\VIM_VCDB.BAK' with init skip,
    name=N'VIM_VCDB-Full Database Backup
GO
```

In this example, the disk parameter for the BACKUP DATABASE command specifies the default backup location used by SQL server. Substitute the disk or directory of your choice. You may want to write the backup copy to a different disk for increased protection or if the default drive (C) has insufficient capacity for both the database and its backup

2. Create a file called BACKUP_VIMDB.CMD in the same directory as the BACKUP_VIMDB.SQL file that you created in step 1. Add the following entry:

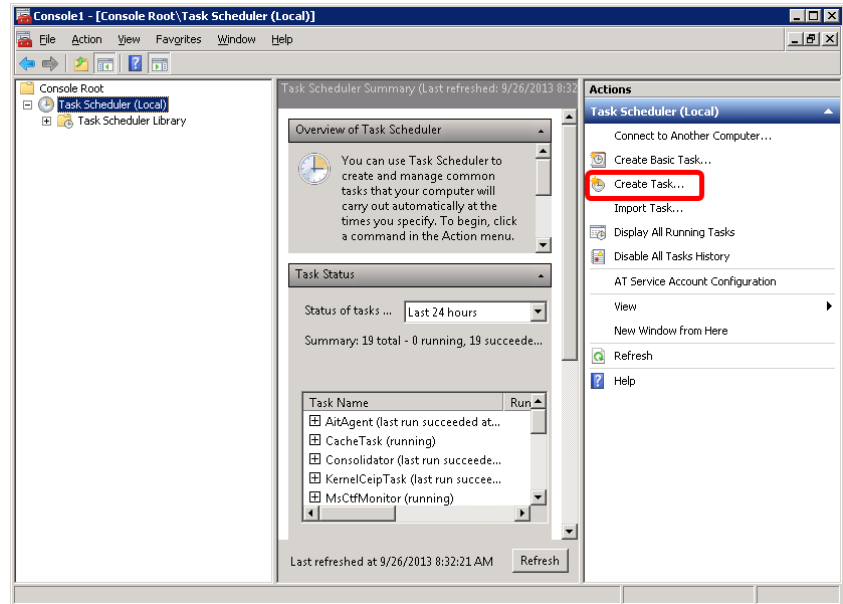
NOTE: Command options are case sensitive.

```
osql -E -S .\VIM_SQLEXP -E -d VIM_VCDB -i BACKUP_VIMDB.SQL
```

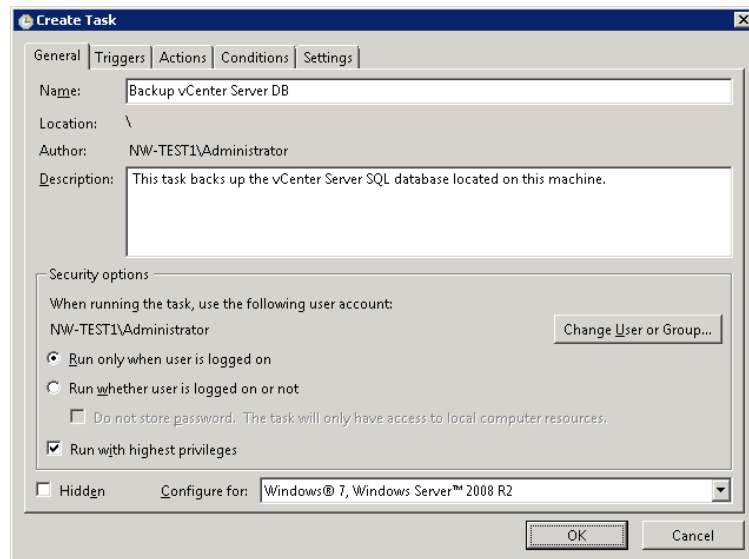
3. Create a task within the Microsoft Task Scheduler to run the Windows CMD script (BACKUP_VIMDB.CMD) created in step 2. While there are different ways to do this, these instructions have you add a task with the Task Scheduler, a Microsoft Management Console (MMC) snap-in.
 - a. To open MMC, click **Start | Run** and type mmc.
 - b. In the MMC window, click **File | Add/Remove Snap-in**.
 - c. Scroll to and select **Task Scheduler** (under **Available snap-ins**) and click **Add**.
 - d. Click **OK** when prompted to select Local computer.
 - e. Click **OK** again to dismiss the **Add or Remove Snap-ins** dialog box.

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- f. Click **Task Scheduler (Local)** in the left pane of the MMC console.
- g. Click **Create Task** under **Actions** to open the **Create Task** dialog box.

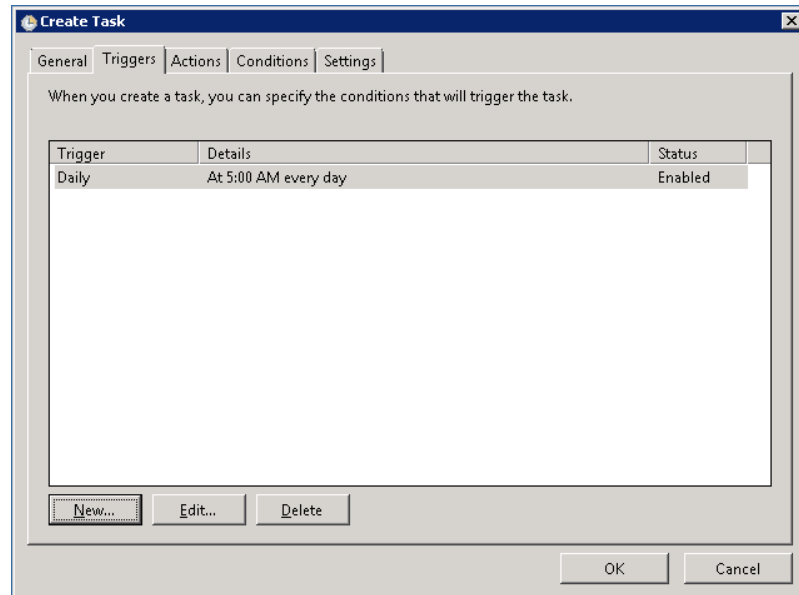


- h. Set values in the **Create Task** dialog box similar to those shown in the examples that follow. In these examples, the two scripts are located in the C:\VimDb directory on the vCenter Server machine. Yours may reside elsewhere.

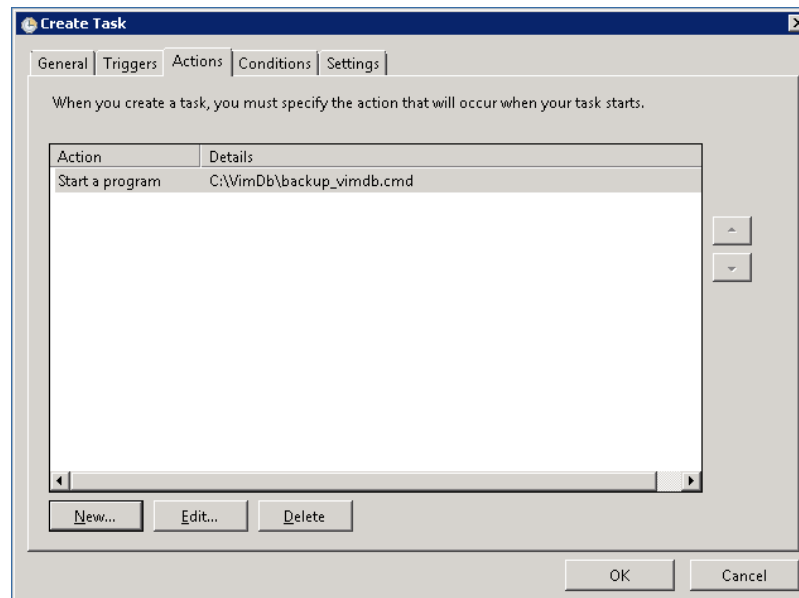


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NOTE! The account that performs this action must be an administrative account, and **Run with highest privileges** should be selected as shown.

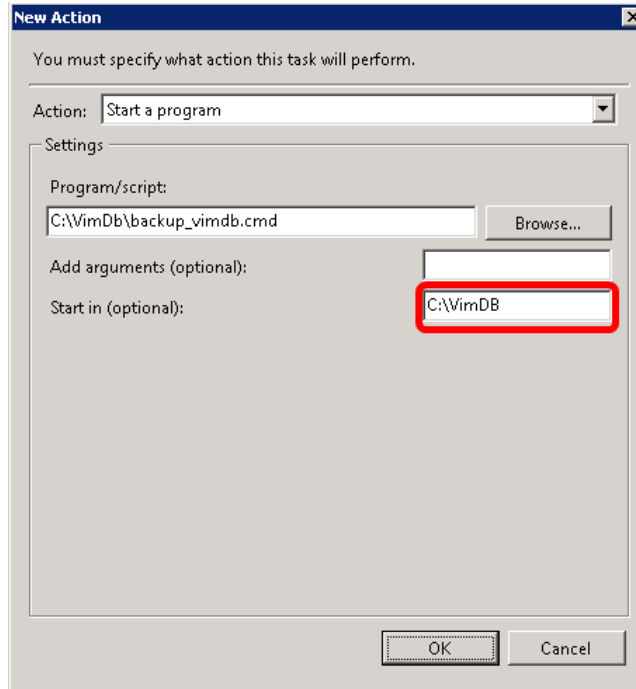


When defining the trigger for this task, specify a time that is approximately one hour before the backup of the vCenter Server machine that STORServer VMB performs. That way, the vCenter Server machine backup will include a copy of the backed-up SQL database. If a restore is necessary, you can restore the database to a state consistent with the vCenter Server machine backup.

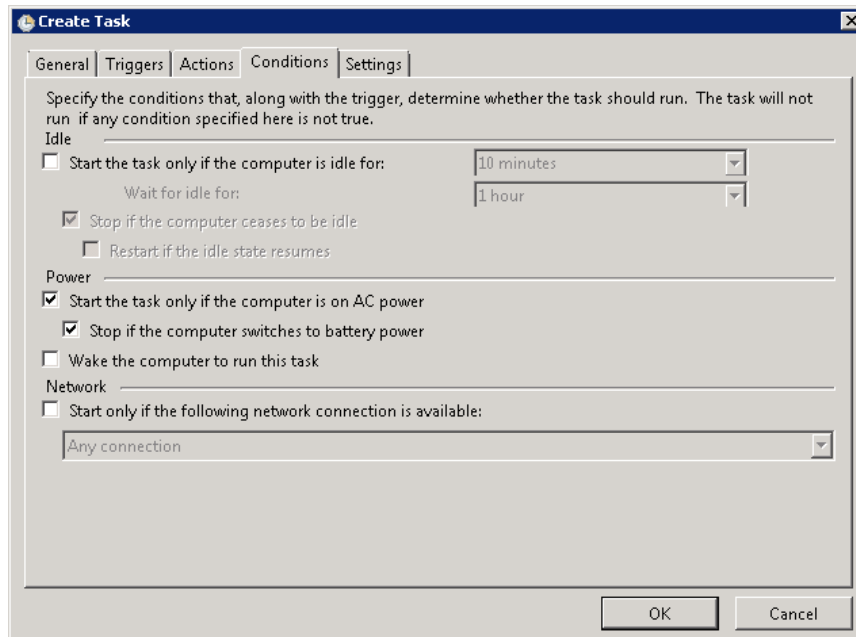


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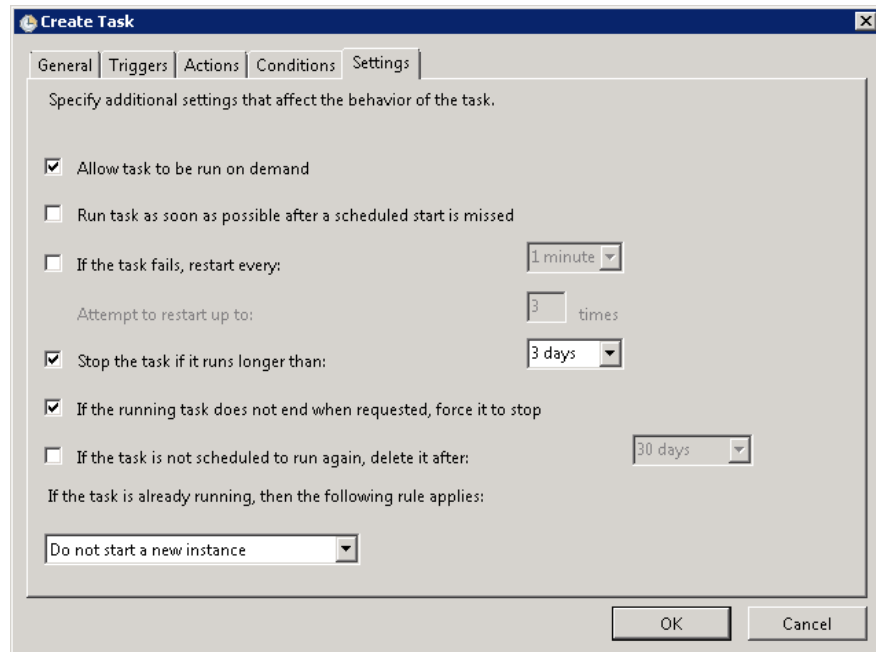
When adding the new action, be sure to specify the directory where your SQL and CMD files reside in the **Start in (optional)** field. For example:



Take default values for the last two tabs. For example:



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Once this task is configured, run it to create a backup copy of the vCenter Server database in the output directory specified by the DISK parameter in the SQL script that you created. If the backup copy fails, run the BACKUP_VIMDB.CMD script interactively from the command prompt. Use the account specified in the task and be sure to open the command prompt as administrator. This produces error messages that are useful when troubleshooting.



About STORServer

STORServer, Inc., headquartered in Colorado Springs, CO, is a leading provider of data backup solutions for the mid-market. We offer a complete suite of appliances, software, and services that solve today's backup, archive, and disaster recovery challenges. For more information on STORServer, please visit our Web site at storserver.com.

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