



# VMware Plug-In

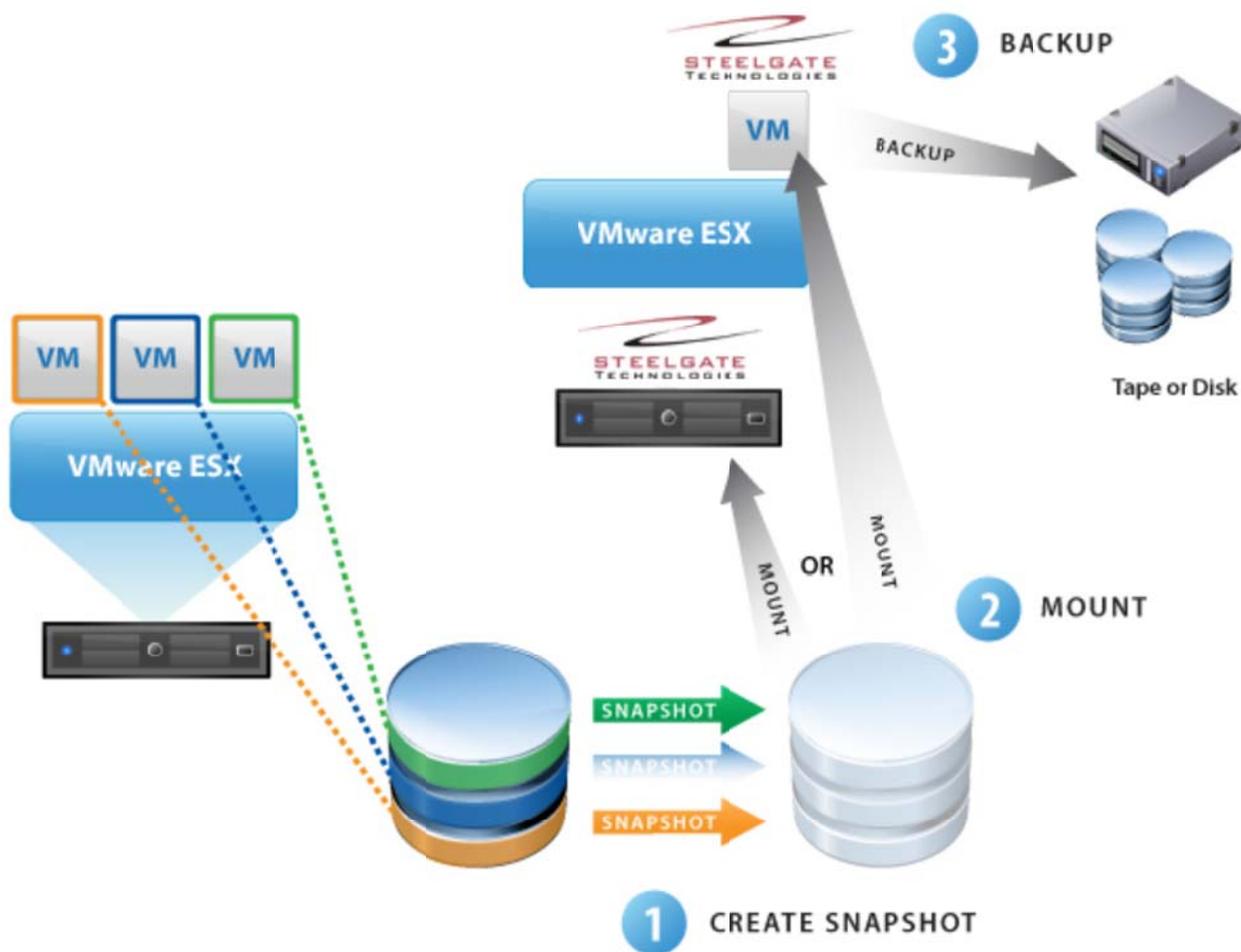
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## Executive Summary

This document will describe multiple things including: how the VMware plug-in for Steelgate Enterprise works with VMware ESX(i) servers along with vSphere, how to configure Steelgate to connect to the VMware infrastructure, what needs to be setup on the VMware infrastructure, and how the backup and restore process works with Steelgate.

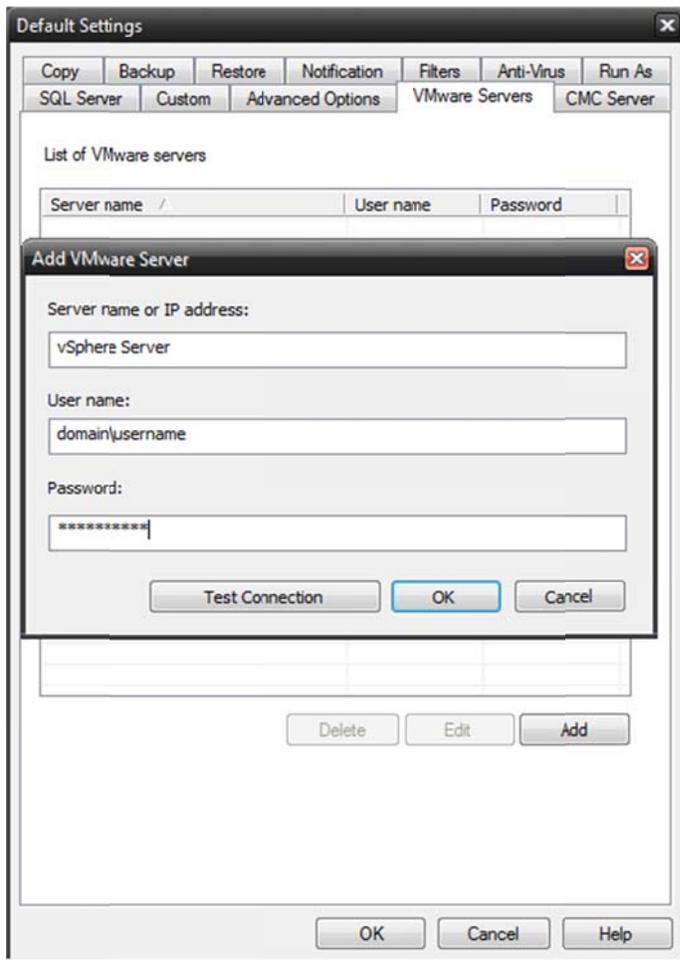
## Requirements

Steelgate Enterprise must be installed on a supported operating system. The machine that has Steelgate Enterprise on needs to have connectivity to either the vSphere server or the ESX(i) server. Steelgate Enterprise can alternatively be installed on the vSphere server, or on a Virtual Machine. Version 4.1 to 5.5 of ESX(i) and vSphere licensed with the vStorage APIs are the currently supported versions of software that the VMware plug-in for Steelgate Enterprise will communicate with.



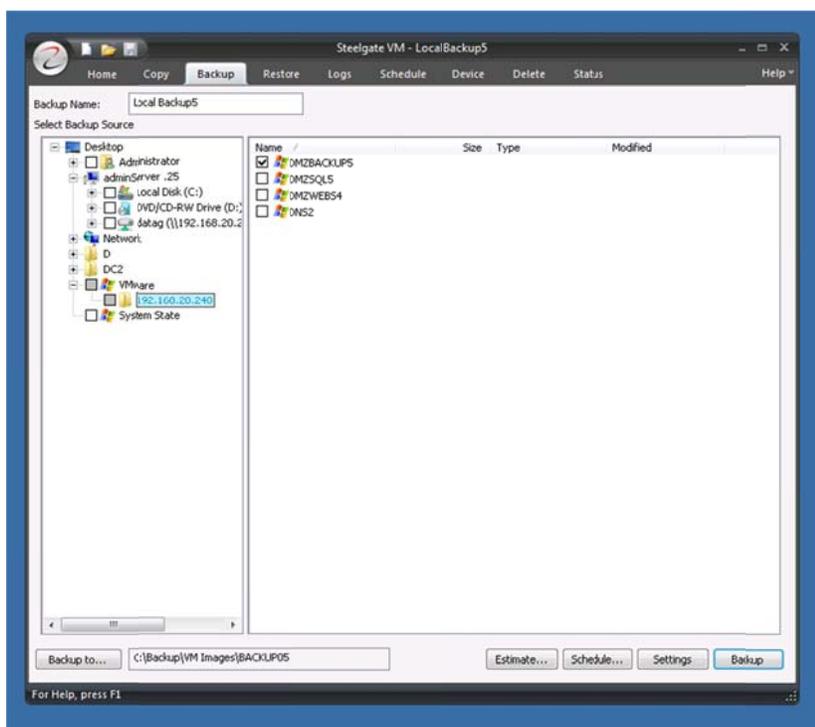
# Configuration of Steelgate

After Steelgate Enterprise has been installed, open the software and click on the Default Settings link on the top left (the "S" icon). Then go to the VMware Server tab in the dialog that comes up, and click Add to add a new connection to a ESX(i) or vSphere server.



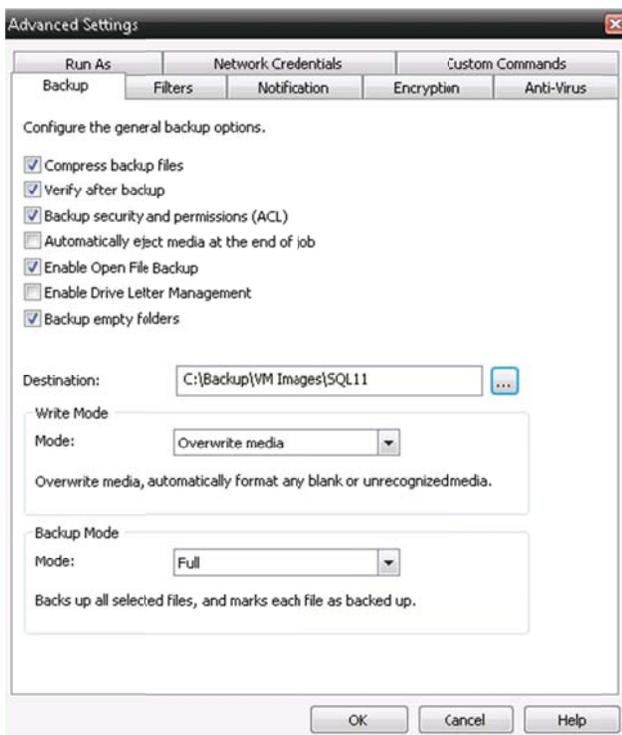
## Selection of Virtual Machines

After the ESX(i) or vSphere server connections have been added to the configuration of Steelgate Enterprise, the backup tab will need to be refreshed, so that a connection to the ESX(i) or vSphere server can be established. This may be accomplished by either pressing F5 on the keyboard or closing and reopening the software in the Backup tab. Once properly refreshed, the screen should appear as below, and the VMware node should be selectable. Navigating to this node will show all the ESX(i) or vSphere servers configured in Steelgate. Clicking on each ESX(i) or vSphere server node will display the Virtual Machines that are available to backup. These machines may be backed up individually, or all of them may be backed up at once.



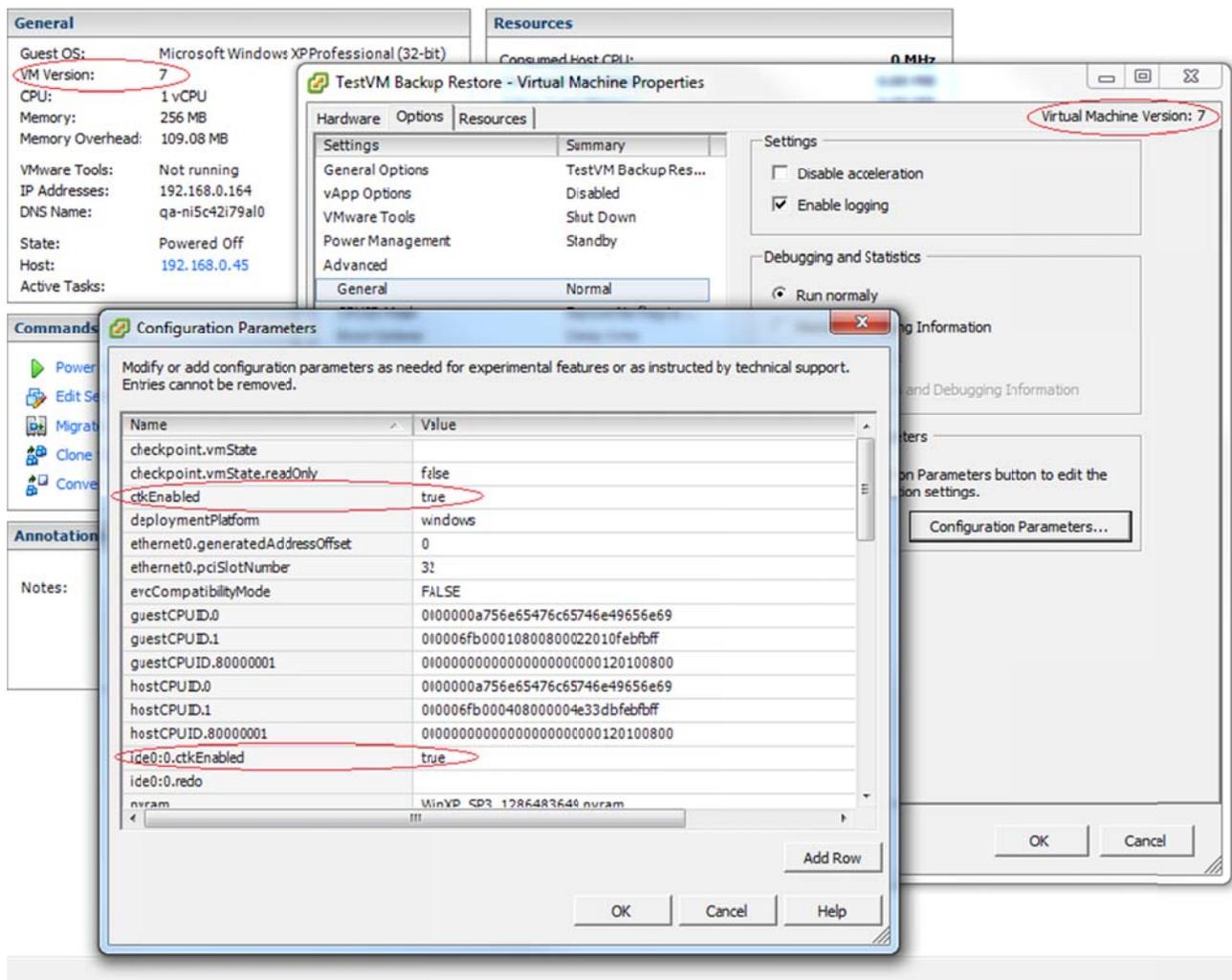
## Configuration of Backup Mode

Once the Virtual Machines are selected for backup, it is important to configure the settings for the backup job. Clicking on the settings button on the backup tab will show the Advanced Settings dialog (shown below). The type of backup performed is set using the Backup Mode dropdown. If Full mode is selected, the entire virtual machine will be backed up each time this script runs. If incremental is selected, then a block level incremental from the last backup of the virtual machine will be performed each time this script runs. If differential is selected, a block level differential backup is run from the last full backup of the Virtual Machine. For the sake of a Virtual Machine a snapshot backup is the same as a full backup, and functions no differently. If attempting to run incremental or differential backups of a Virtual Machine, Steelgate must be connecting to a vSphere server and the Virtual Machine must be configured to support incremental and differential backups.



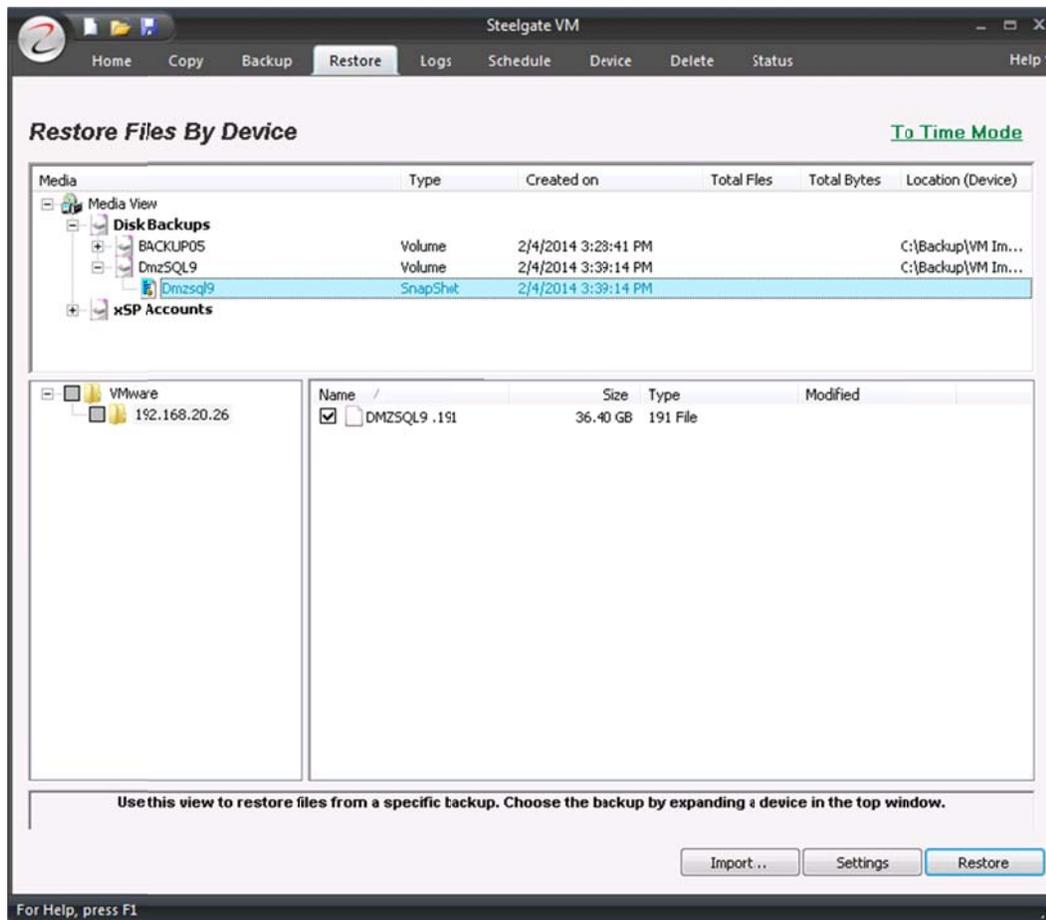
# Configuration of Virtual Machines for Incremental and Differential backups

(If you have a really old virtual Machine version) - As a default on a new Virtual Machine, the tracking of changed blocks (CBT) isn't enabled as CBT will slow down the execution of a Virtual Machine. To enable CBT it is necessary to install the latest version of VMware tools on the Virtual Machine. The Virtual Machine has to have hardware version 7 or later. There will normally have to be some changes done to the Virtual Machine configuration as well. The main parameter that has to be changed or added is "ctkEnabled" with the value "true", but for each disk on which changes should be tracked, CBT has to be enabled separately. For example for the disk device scsi:0:1 it is necessary to add a parameter "scsi:0:1.ctkEnabled" with the value "true". If CBT isn't enabled at all or for a specific device, the device will be backed up in full mode every time, incremental and differential backup of a disk that does not have this enable is not possible as the information about changed blocks are not available.



# How to Restore a Virtual Machine

Restoring a Virtual Machine is very easy. Simply select the Virtual Machine to restore in the Restore UI and click the restore button. If a Virtual Machine of the same name that you are going to restore already exists on the ESX(i) or vSphere server that you are restoring to, the Steelgate Enterprise software will automatically create the Virtual Machine in your inventory with the name of the Virtual Machine that you are restoring along with a timestamp at the end of the name of the Virtual Machine as to not cause conflicts with the existing Virtual Machine.



# Advanced Restore with Differential and Incremental Backups of Virtual Machines

Restoring from a differential or incremental backup of a Virtual Machine requires some thought and knowledge of how things were backed up. The restore of a differential or incremental backup of a Virtual Machine is also performed in a reverse order of how other restore operations are performed by traditional backup software. Performing a successful restore means understanding the point in time that the system is being restored to, and having a good understanding of how the restore process works.

In the case of an incremental backup, the process is simple. Select the last incremental backup corresponding to the restore point as would be done with a traditional backup. It is necessary to make note of every incremental backup that occurred between the current point, and the original full backup. The restore order is to restore the latest (furthest from the full backup) incremental backup first, then restore each in reverse order until reaching the full backup, at which point the full backup should be restored.

In the case of a differential backup, the process is even easier. First restore the differential backup from the desired date, then restore the full backup before it.

In the case of a mixed backup, it is necessary to first apply any incremental backups since your last differential, then the differential, then the full backup.

This process seems to be backwards, but because each of these restores is a block level restore, the process is generally very fast. In general all the snapshots that were temporarily created during the restore should be removed on completion of the restore. If not, it may be necessary to remove the snapshots manually on the Virtual Machine through the vSphere client interface.

## To restore an image to a different host

After you have restored the image file to a .nvm format file in a temporary location, you will need to run this command line specifying the host, user/password, name and data store location.

You will need to run the following command to load the image to different host:

```
C:\Program Files (x86)\Steelgate\Steelgate Steelgate VM\vmware>vmware restore --host 192.168.20.3 --user root --password PASSWORD --vmname "DMZSQL9" --file "C:\Restore\DMZSQL9.nvm" --datastore "datastore1"
```

Variables

- Host
- User
- Password
- vmname
- file
- datastore

## Considerations

**LOCAL BACKUP:** Backing up your image locally does not require a temp folder, it will send your image from your host to your backup destination directly.

**CLOUD BACKUP:** If you backup your image to the cloud, please make sure that your temp folder has as much space as the image you will be backing up as it needs to copy it to encrypt it and compress it before it sends it to the cloud. You can change the temp location by clicking on the “S” on the top left, Default Settings, Advanced Options and Temporary Files Directory.

We recommend that you leave the settings to “FULL” to utilize the FastBIT which will determine the differences between the two full backups and only send the changed parts of the full backups.

Restoring directly to an alternate ESX(i) or vSphere server is only supported if the name of the server is the same as when the VM was backed up currently.