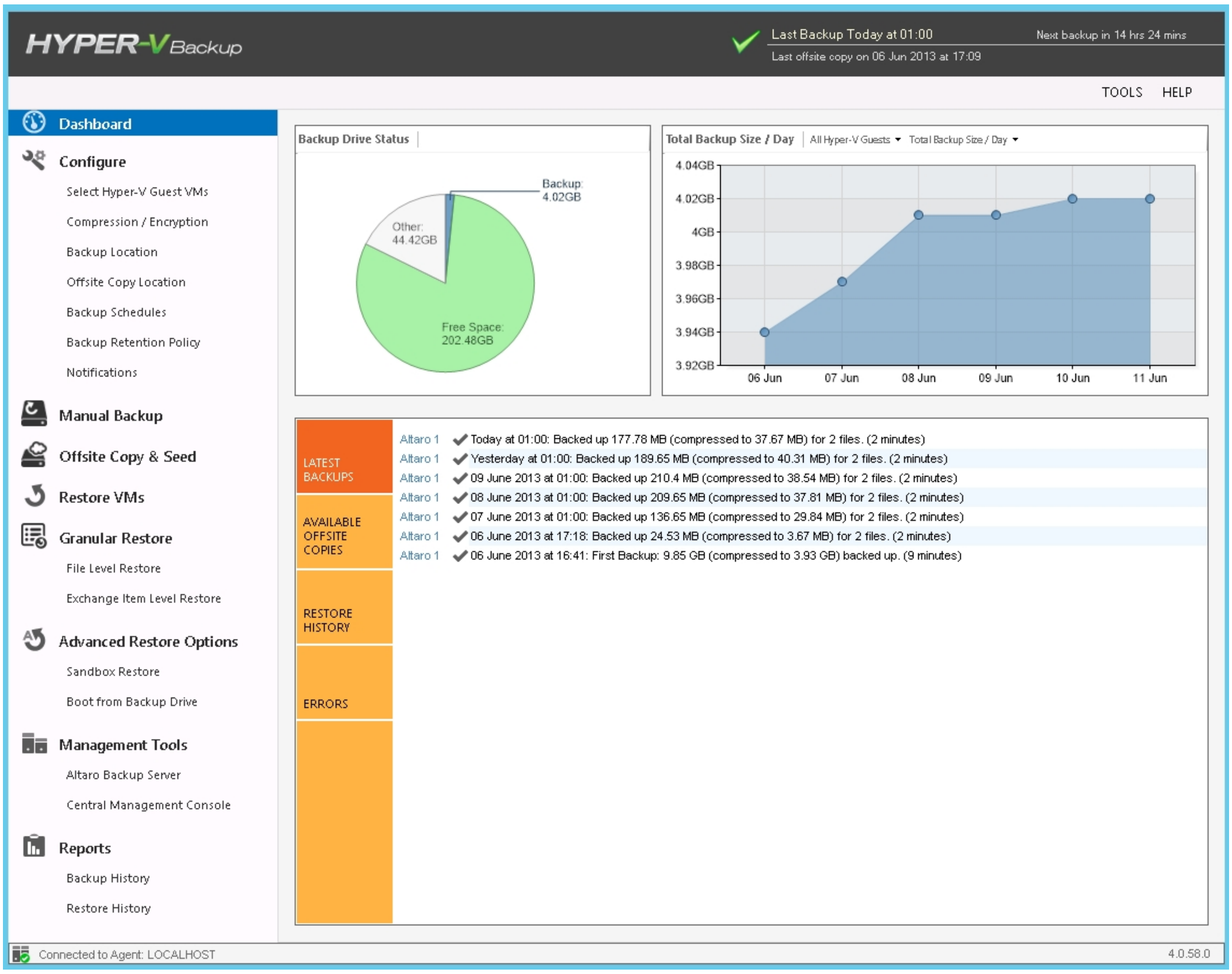
Altaro Hyper-V Backup V4 - User Manual

Table of contents

Introducing Altaro Hyper-V Backup



Last Backup Today at 01:00
Last offsite copy on 06 Jun 2013 at 17:09
Next backup in 14 hrs 24 mins

```
Altaro 1  ✓ Today at 01:00: Backed up 177.78 MB (compressed to 37.67 MB) for 2 files. (2 minutes)
Altaro 1  ✓ Yesterday at 01:00: Backed up 189.65 MB (compressed to 40.31 MB) for 2 files. (2 minutes)
Altaro 1  ✓ 09 June 2013 at 01:00: Backed up 210.4 MB (compressed to 38.54 MB) for 2 files. (2 minutes)
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Altaro 1  ✓ 06 June 2013 at 16:41: First Backup: 9.85 GB (compressed to 3.93 GB) backed up. (9 minutes)
```

Connected to Agent: LOCALHOST

Main features in Altaro Hyper-V Backup:

- Hot Backups - MS VSS Integration

Back up live VMs with zero downtime by leveraging the Microsoft VSS Hyper-V Writer.

- Restore Clones

Restore VMs to the same Hyper-V Host but with a different name.

- Restore to different Hyper-V host

Restore an individual or a group of VMs to a different Hyper-V Host.

- ReverseDelta Incremental Backup

Incremental Backup Technology for hyper-speed efficiency.

- File Level Restore

Mount backed up VHDs and restore files without having to restore a whole Virtual Machine.

- Backs up Hyper-V clusters

Cluster support for larger installations.

- Backup schedules

Set different backup schedules for different VMs.

- Restore different versions

Restore from multiple points in time rather than 'the most recent backup'

- Supports Microsoft Hyper-V Server (Core)

Works with the free Microsoft S Hyper-V Server (Core).

- Sandbox Restore Tests

Build a plan to make sure that in case of disaster you're fully covered.

- Backs up Hyper-V Snapshots

If your VMs have snapshots than you can back up the snapshots as well.

- Offsite Backup with WAN Acceleration

Backup to an offsite Altaro Backup Server over a WAN connection for added redundancy.

- Remote Management

Manage your Altaro Hyper-V Backup from another machine.

- Backup Compression

Get smaller and faster backups by enabling compression on your backup drive.

- Backup Encryption

Secure your backup data with military grade AES encryption.

- Microsoft Exchange backup and Item Level Restore

Backup your Microsoft Exchange server and restore at Item level from within the Exchange database.

Add-Ons

Altaro Hyper-V Backup comes with 2 additional installer packages for the different add-ons you can install for different tasks.
Below you can find an explanation of the 3 different installer packages and what they are used for:

Altaro Hyper-V Backup

This is the main installation which must be installed on the Hyper-V host/server as it contains the code that does the actual backup. The Altaro Hyper-V Backup install includes also the Altaro Remote Management Console as part of the installation. Once you install Altaro Hyper-V Backup on the Hyper-V host/server just run the management console from the start programs group.

If you want to manage Altaro Hyper-V Backup from a different machine then you must install the Altaro Management Tools (below).
If you want to make use of the off-site backup feature in Altaro Hyper-V Backup then you must install the Altaro Backup Server (below) on a remote machine.

Altaro Remote Management Console

This will install a remote management console which can connect to one or many remote installations of Altaro Hyper-V Backup. This is only required to be installed if you want to manage Altaro Hyper-V Backup from a different machine such as your desktop PC.

The installation file for the Altaro Management Tools can be downloaded here: http://www.altaro.com/hyper-v-backup/download-tools.php
Download the file and install it on the PC where you want to manage backups from.

Altaro Backup Server

This is only required if you want to enable off-site backups. You will need to identify a machine that will host the off-site backups and install the Altaro Backup Server on that machine. This server may be connected to the Altaro Hyper-V Backup machine via both a LAN or a
WAN connection.

Important: TCP Ports **35101 - 35105** are used for communication between the Altaro Hyper-V Backup software and the Altaro Backup Server and **must** be allowed through.

The installation file for the Altaro Backup Server can be downloaded here: http://www.altaro.com/hyper-v-backup/download-tools.php
Download the installer file and install it on the machine that you will use for off-site backups.

Click here to see a sample scenario of all roles installed and their usage.

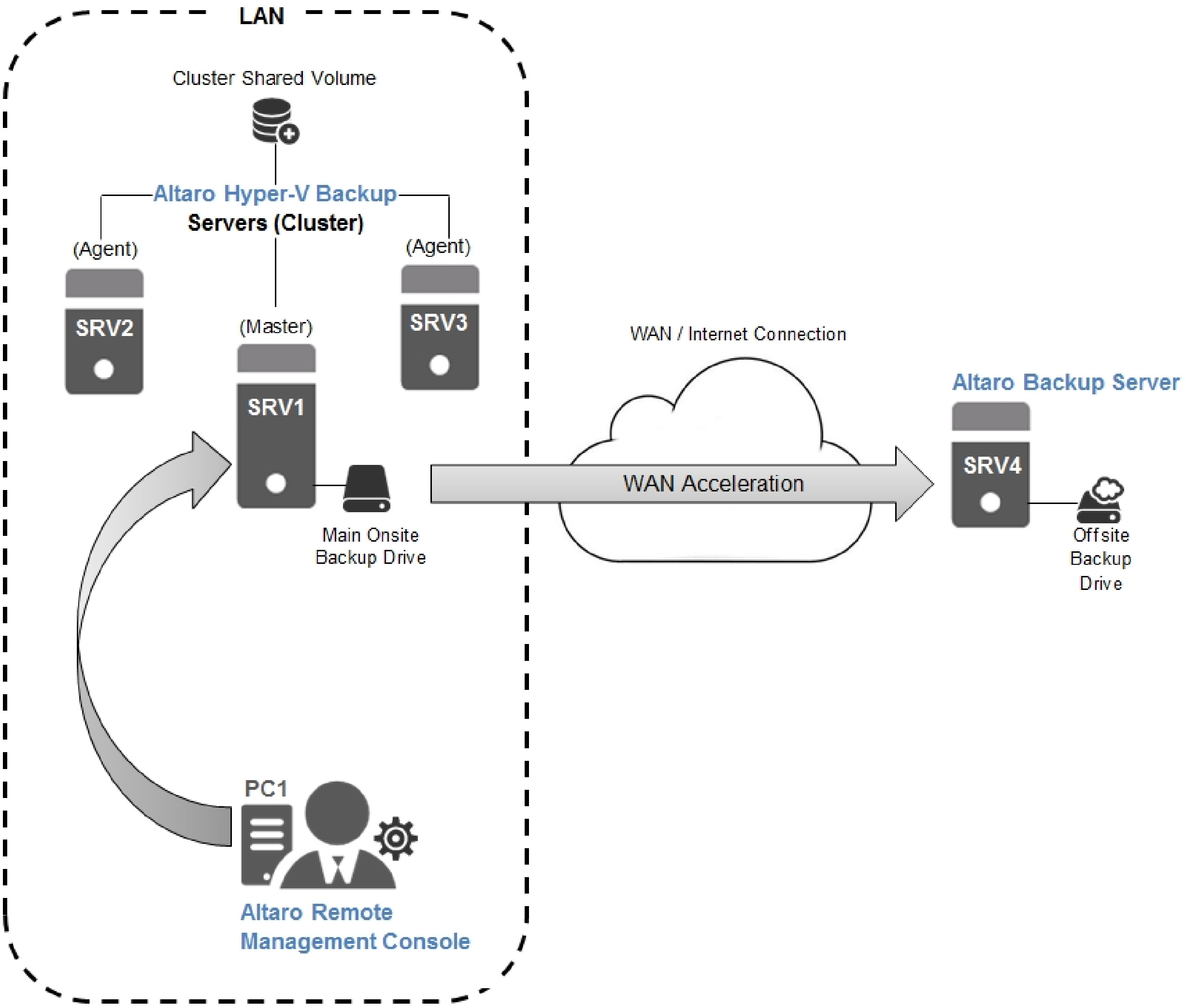
Sample Scenario

Below we have described a sample scenario using all Altaro Hyper-V Backup roles as an example.

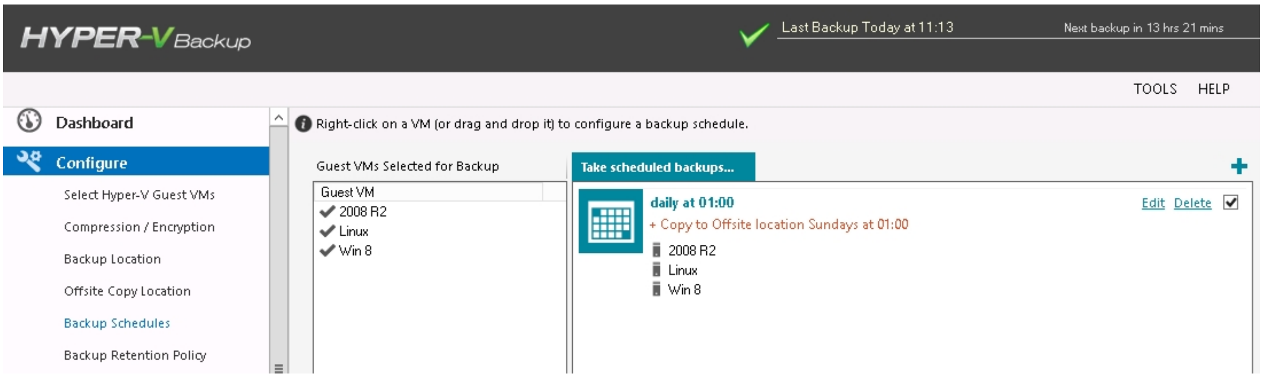
In this scenario, we are using a Cluster of 2 Hyper-V nodes hosting 3 VMs in total.
We also have a separate server connected via WAN used for off-site backups, and a workstation machine used to remotely manage the Altaro backups and configuration.

SRV1 - Clustered Hyper-V Server running Windows Server 2012 hosting 2 VMs
SRV2 - Clustered Hyper-V Server running Windows Server 2012 hosting 1 VM
SRV3 - Clustered Hyper-V Server running Windows Server 2012 hosting no VMs
SRV4 - An off-site server running Windows Server 2012
PC1 - A workstation machine used to remotely manage Altaro Hyper-V Backup

Below is a diagram showing each machine and the appropriate role to be installed on it.



Below is a screenshot of the backup schedule that was configured in this example:



Last Backup Today at 11:13

Next backup in 13 hrs 21 mins

Right-click on a VM (or drag and drop it) to configure a backup schedule.

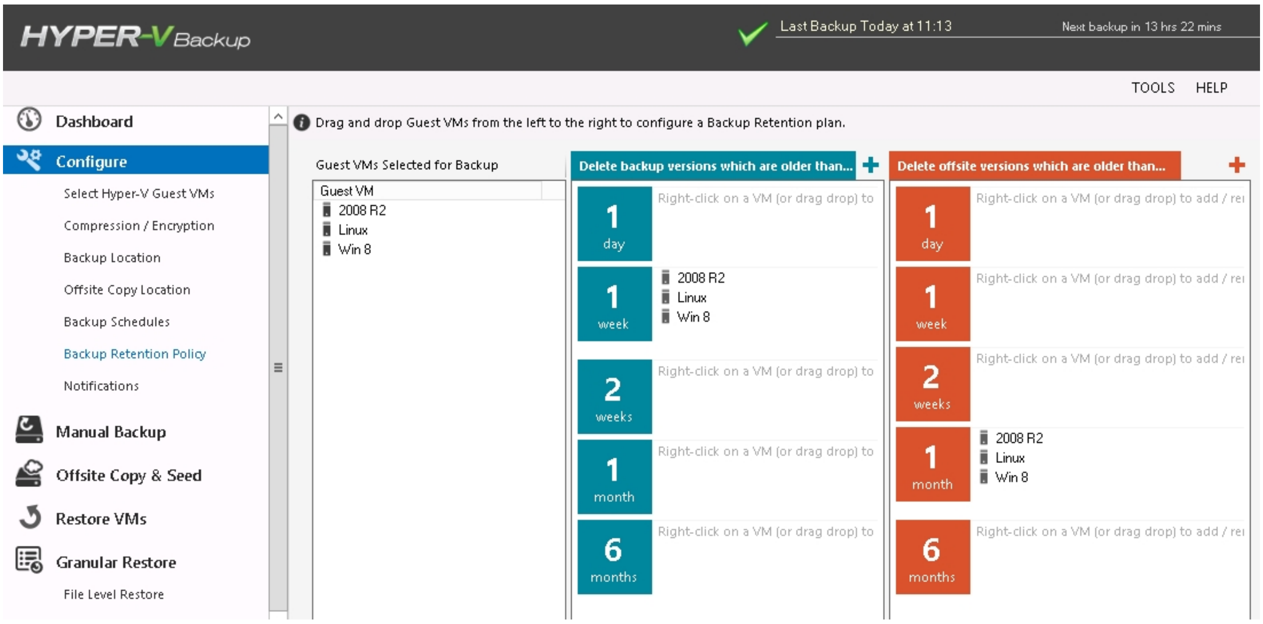
Guest VM
✓ 2008 R2
✓ Linux
✓ Win 8

daily at 01:00
+ Copy to Offsite location Sundays at 01:00
2008 R2
Linux
Win 8

☑

In this case backups are taken to a local disk E:\ every weekday at 01:00
A second copy of the backup is taken to an Offsite location every Sunday at 01:00. This will be stored on the Altaro Backup Server called SRV3 over a WAN accelerated connection.

Below is a screenshot of the retention policy that was configured in this example:



Drag and drop Guest VMs from the left to the right to configure a Backup Retention plan.

Guest VMs Selected for Backup

Guest VM
2008 R2
Linux
Win 8

Delete backup versions which are older than...	
1 day	Right-click on a VM (or drag drop) to
1 week	2008 R2 Linux Win 8
2 weeks	Right-click on a VM (or drag drop) to
1 month	Right-click on a VM (or drag drop) to
6 months	Right-click on a VM (or drag drop) to

Delete offsite versions which are older than...	
1 day	Right-click on a VM (or drag drop) to add / re
1 week	Right-click on a VM (or drag drop) to add / re
2 weeks	Right-click on a VM (or drag drop) to add / re
1 month	2008 R2 Linux Win 8
6 months	Right-click on a VM (or drag drop) to add / re

In this case, backup versions up to 1 week old will be kept on the primary backup location E:\ and backup versions up to 1 month old will be kept on the remote Altaro Backup Server.
Since backups run daily to the E:\ drive, and weekly to the Altaro Backup server, the results of this retention policy will be:

- 7 backup versions will be kept on E:\
- 4 backup versions will be kept on the remote Altaro Backup Server

Different Editions

Altaro Hyper-V Backup - Edition Comparison

The following table highlights the different features available in the 3 different editions of Altaro Hyper-V Backup:

	Free Edition	Standard Edition	Unl
Number of Virtual Machines that can be backed up and restored per host	2 VMs	5 VMs	Un
MS Hyper-V Cluster Support (CSV Support)	✗	✗	
Exchange Item Level Restore Restore individual items from backed up VMs	✗	✗	
Remote & Central Management Console	✗	✓	

Hot/Live Backups Back up running VMs without having to stop them	✓	✓	
Fast & Small Backups - Compression	✓	✓	
Offsite Backups over WAN/Internet Connection (WAN Acceleration)	✗	✓	
Military Grade (AES) Encryption of Backups	✗	Offsite Backups Only	Offsit
ReverseDelta Incremental Backup Technology	✓	✓	
File Level Restore	✗	✓	
Restore Clone Can restore VMs to the same Hyper-V Host but with a different name i.e. does not overwrite existing VM.	✗	✓	
Restore Overwrite Restore a backed up VM is just a 5 click process.	✓	✓	
Restore VMs to a different Hyper-V host	✗	✓	
Sandbox Restore Build and test a recovery plan to ensure you're covered in case of a disaster.	✗	✓	
Community Forum Support	✓	✓	
Priority Technical Support	✗	✓	

Getting Started

System requirements

Supported Host Operating Systems:

Altaro Hyper-V Backup:

- Windows 2008 R2 (all editions)
- Windows 2008 R2 SP1
- Windows Hyper-V Server 2008 R2 (core installation)
- Windows Server 2012 (all editions)
- Windows Hyper-V Server 2012 (core installation)
- Windows Server 2012 R2 (all editions)
- Windows Hyper-V Server 2012 R2 (core installation)

Please note that Altaro Hyper-V Backup needs to be installed on the Hyper-V Host (not within the guest).

Altaro Management Tools:

- Windows 2008 R2 (all editions)
- Windows 2008 R2 SP1
- Windows Server 2012 (all editions)
- Windows Server 2012 R2 (all editions)
- Windows 7 (64-Bit)
- Windows 8 (64-Bit)

Altaro Backup Server:

- Windows 2008 R2 (all editions)
- Windows 2008 R2 SP1
- Windows Hyper-V Server 2008 R2 (core installation)
- Windows Server 2012 (all editions)
- Windows Server 2012 R2 (all editions)
- Windows Hyper-V Server 2012 (core installation)
- Windows 7 (64-Bit)
- Windows 8 (64-Bit)

Required Specifications:

Altaro Hyper-V Backup:

- 128 MB RAM
- 100 MB Hard Disk Space (for Altaro Hyper-V Backup Program and Settings files)
- MS .NET Framework 3.5 on Windows Server 2008 R2

- MS .NET Framework 4.0 on Windows Server 2012

Altaro Backup Server:

- Minimum of i5 (or equivalent) processor
- 75 MB RAM + an additional 75MB for each concurrent backup/restore.
  (For example if running 3 concurrent backups then minimum requirement is 75MB (base) + 75MB + 75MB + 75MB = Total 300 MB RAM)

Communication Ports:

Below is a list of the default TCP ports used by our software and their purpose. All these ports must be allowed.

TCP Ports	Description
35100	Communication with the Remote Management Console
35101 - 35105	Communication with the Altaro Backup Server
24251 - 24252	Communication between agents on the same cluster
24253	Communication from the Remote Management Console to Agent

Supported Backup Destinations

Altaro Hyper-V Backup supports backing up to:

- USB External Drives
- eSata External Drives
- USB Flash Drives
- Fileserver Network Shares using UNC Paths
- NAS devices (Network Attached Storage) using UNC Paths
- PC Internal Hard Drives (recommended only for evaluation purposes)
- RDX Cartridges

Contacting Technical Support

Online Support Center

Find resolutions for common problems, answers to frequently asked questions, product change logs and Live Chat support during office hours Monday to Friday.

Access the Online Support Center here: http://support.altaro.com

Email Support

Contact us via email - we will reply within 24 hours (business hours and weekdays)..

You can contact us via email on support@altaro.com.

Check our Online Community Forum

Find answers to most common questions, suggest new feature ideas and see how other users are making use of our software.

Access the Online Community Forum here: http://community.altaro.com

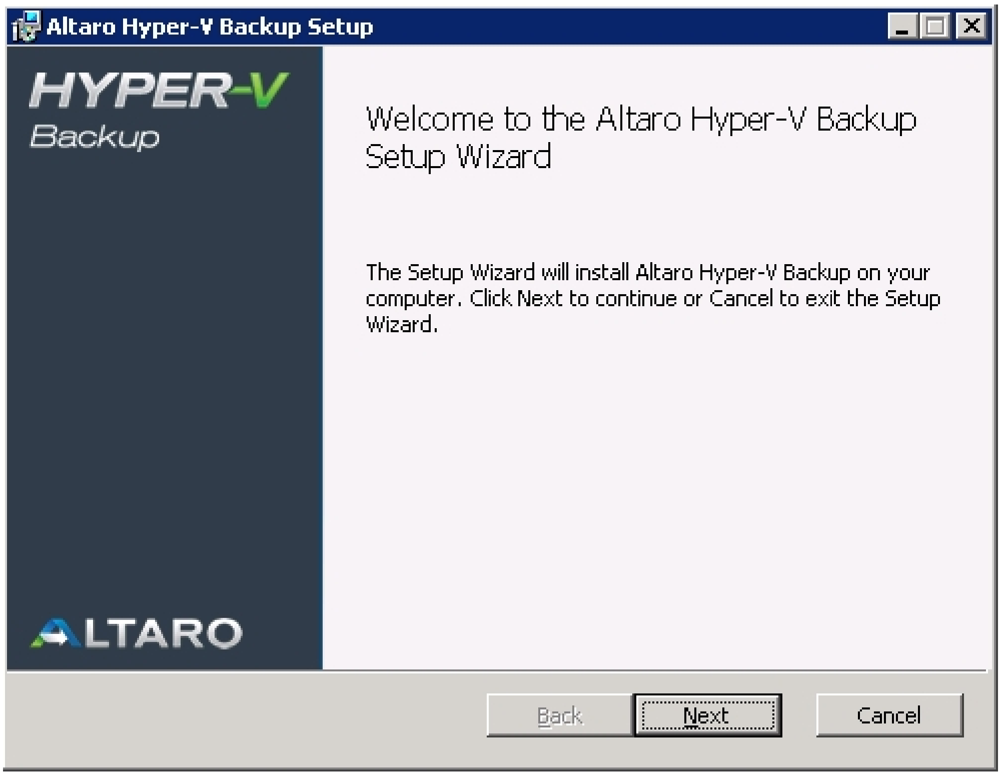
Installing & Uninstalling

Installing Altaro Hyper-V Backup

If you do not have a copy of the installer for Altaro Hyper-V Backup please obtain a copy from www.altaro.com before following this tutorial.

1. Launch the downloaded file: **altarohypervbackupsetup.exe**. On certain Operating Systems you may receive a warning informing you that certain downloads may be unsafe. Altaro Hyper-V Backup is signed using Altaro's digital signature and therefore this warning can be ignored.

2. Next you will be presented with the welcome screen of the installer. Simply click [Next].

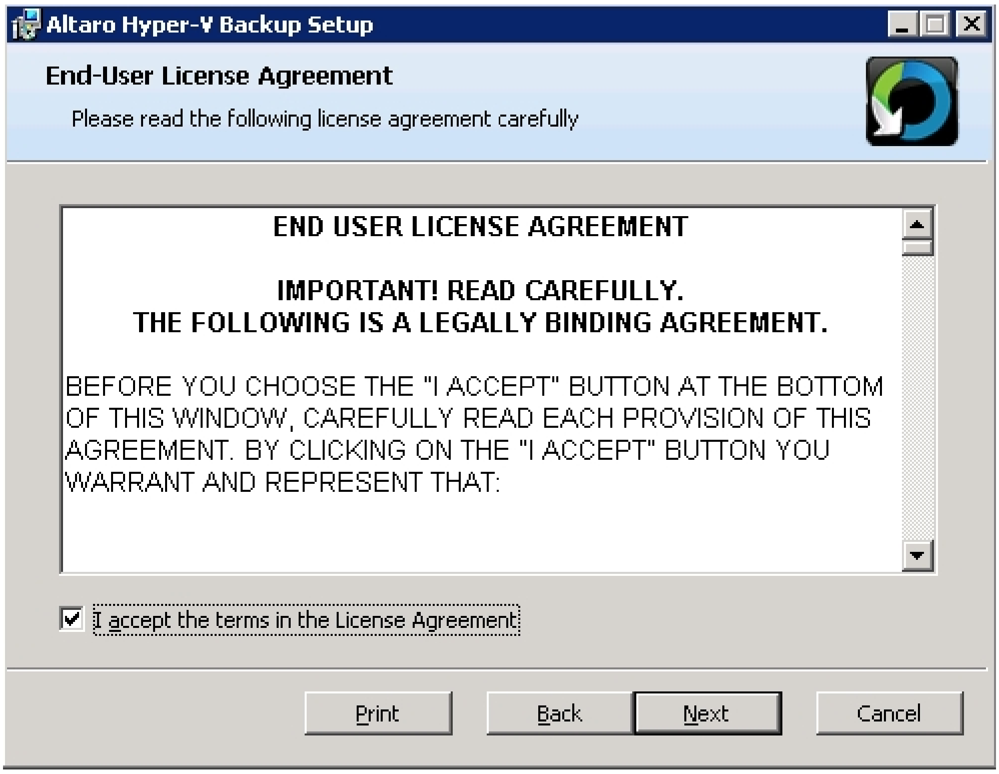


Altaro Hyper-V Backup Setup

Welcome to the Altaro Hyper-V Backup Setup Wizard

The Setup Wizard will install Altaro Hyper-V Backup on your computer. Click Next to continue or Cancel to exit the Setup Wizard.

3. You will now see the End User License Agreement into which you will enter with Altaro Ltd. Please read through the agreement and check the “I Accept...” checkbox. Once you have agreed to the terms and conditions in the EULA you can press [NEXT].



Altaro Hyper-V Backup Setup

End-User License Agreement

Please read the following license agreement carefully

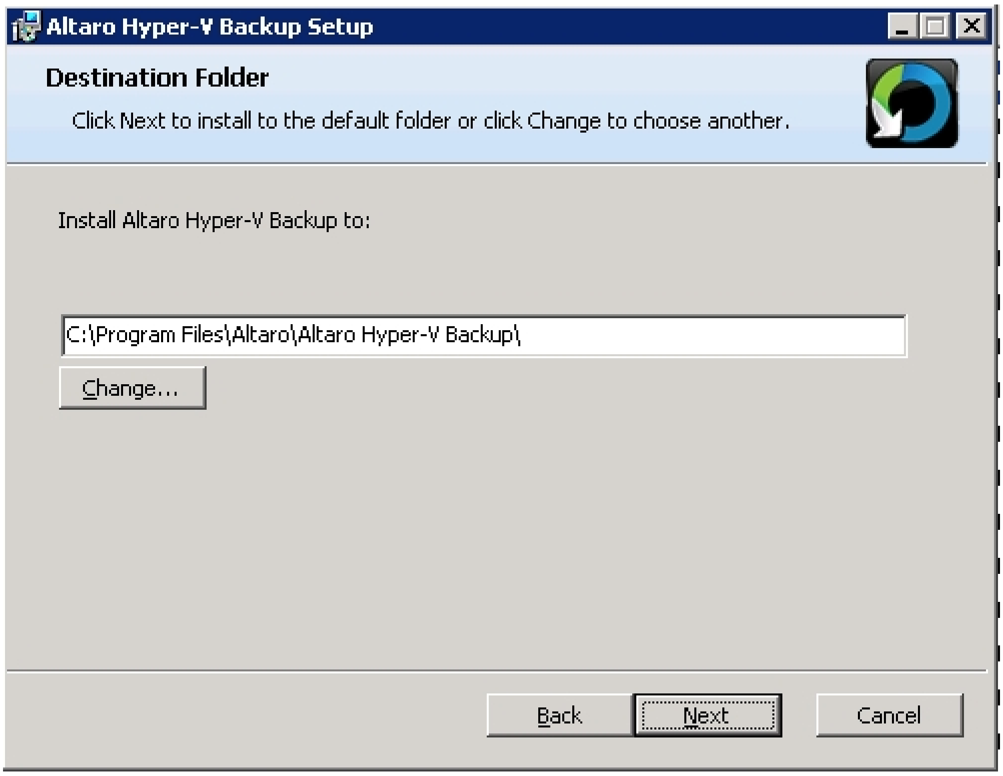
END USER LICENSE AGREEMENT

IMPORTANT! READ CAREFULLY.
THE FOLLOWING IS A LEGALLY BINDING AGREEMENT.

BEFORE YOU CHOOSE THE "I ACCEPT" BUTTON AT THE BOTTOM OF THIS WINDOW, CAREFULLY READ EACH PROVISION OF THIS AGREEMENT. BY CLICKING ON THE "I ACCEPT" BUTTON YOU WARRANT AND REPRESENT THAT:

☑ I accept the terms in the License Agreement

4. At this point you will be prompted for the Destination Folder of the installation. In most normal cases you should leave the installation path as default. Altaro Hyper-V Backup will be installed within your Program Files folder.



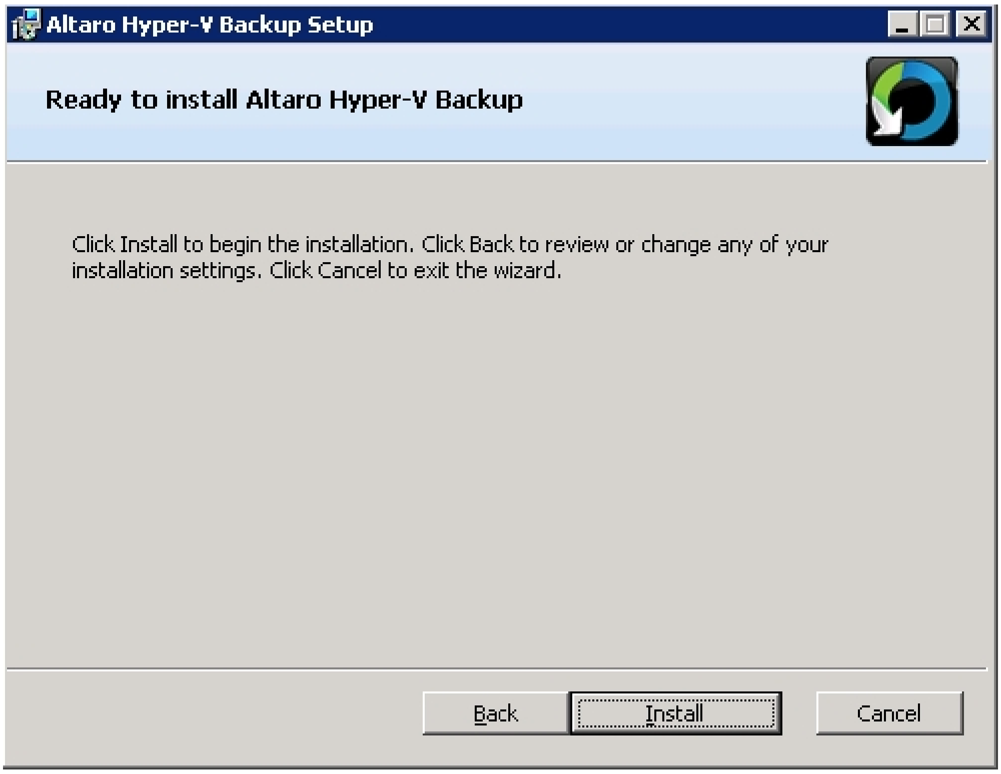
Destination Folder

Click Next to install to the default folder or click Change to choose another.

Install Altaro Hyper-V Backup to:

C:\Program Files\Altaro\Altaro Hyper-V Backup\

5. Next you will see a screen asking you for confirmation to install. Please press [Install].



Ready to install Altaro Hyper-V Backup

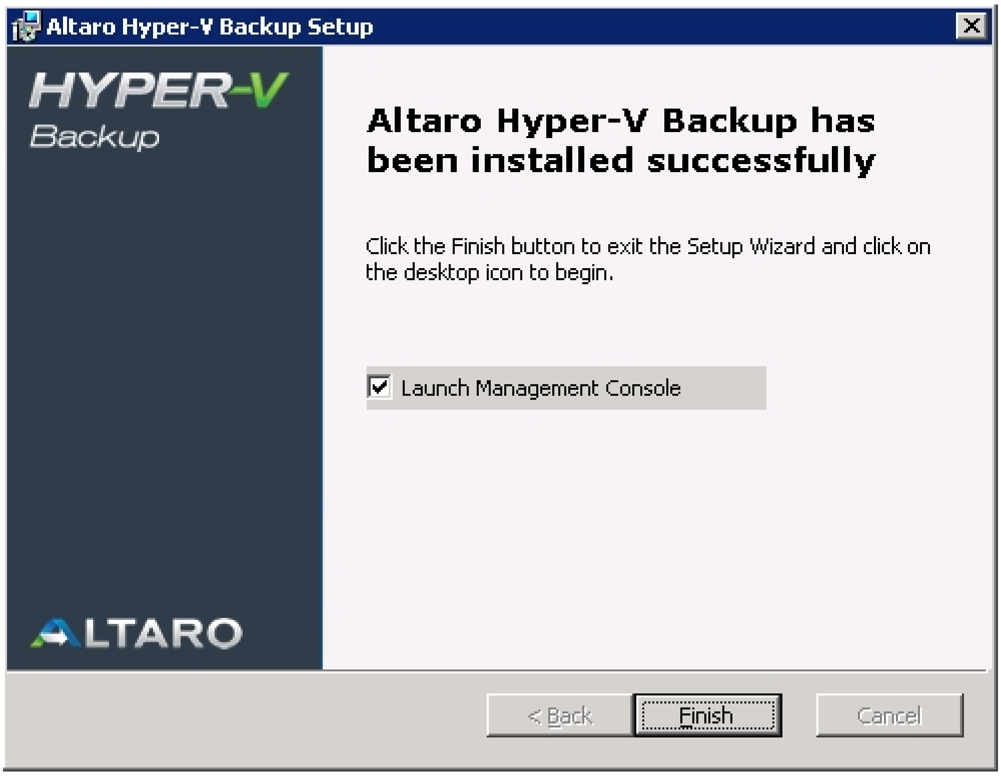
Click Install to begin the installation. Click Back to review or change any of your installation settings. Click Cancel to exit the wizard.

6. At this point the installation will begin. You will be presented with a progress bar updating you with

the progress of the installation. Installation should only take a few seconds. **Please note that if you have UAC enabled on the Server then a UAC prompt may be displayed**. Please click allow for the installation to complete. UAC is required for the following reasons:

- Files are being copied to the Program Files Folder.
- A Windows Service is being installed.

7. Once the installation is done you will be presented with the successful installation screen. A checkbox is displayed and checked by default indicating whether the **Management Console** should be launched automatically.



Altaro Hyper-V Backup Setup

Altaro Hyper-V Backup has been installed successfully

Click the Finish button to exit the Setup Wizard and click on the desktop icon to begin.

☑ Launch Management Console

Should a screen informing you that the installation has failed appear please contact support.

8. Finally the Altaro Hyper-V Backup Management Console will appear. Please click here for a tutorial on configuring your Backup Profile.

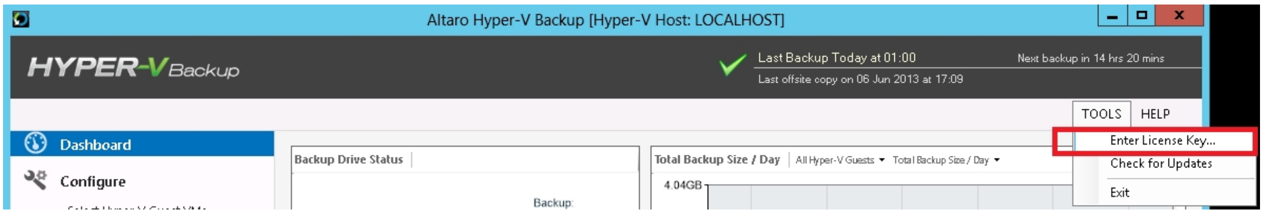
Entering the License Key

Once you order Altaro Hyper-V Backup you will receive an email containing your unique License Key. The License Key is a block of letters.

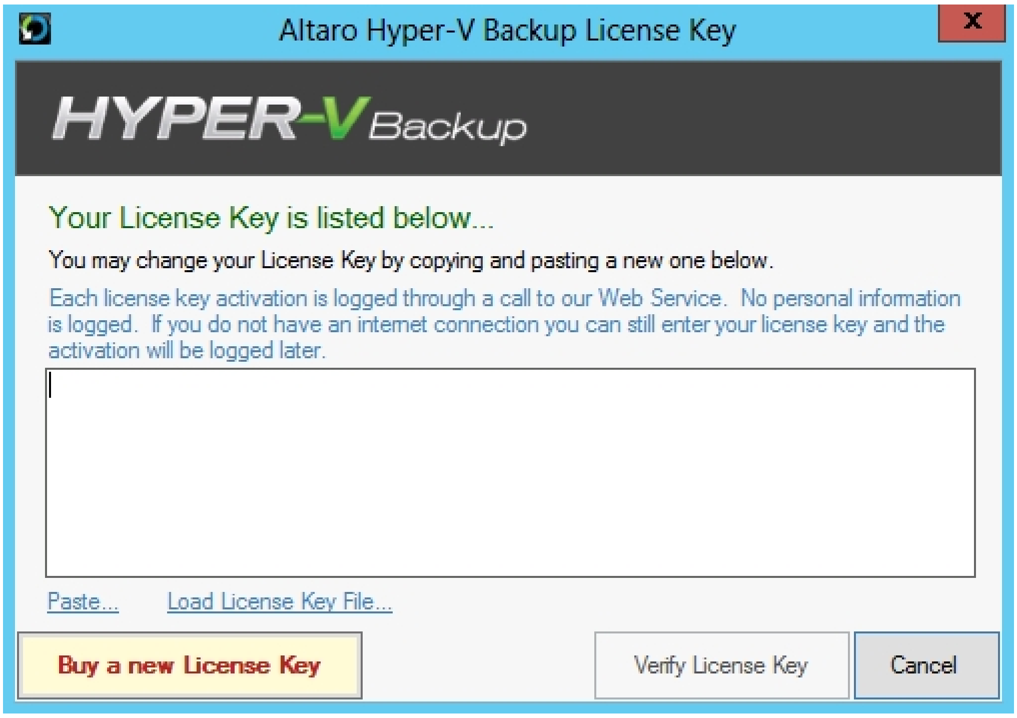
To enter your license key please follow these steps:

1. Launch the Altaro Hyper-V Backup **Management Console**.

2. Click '**Tools**' >> '**Enter License Key...**' from top right menu:



3. Next the license key window will appear as shown below.



Your License Key is listed below...

You may change your License Key by copying and pasting a new one below.

Each license key activation is logged through a call to our Web Service. No personal information is logged. If you do not have an internet connection you can still enter your license key and the activation will be logged later.

4. Now open the email that contains your License Key. Once you select the License Key, right-click on it and select Copy.

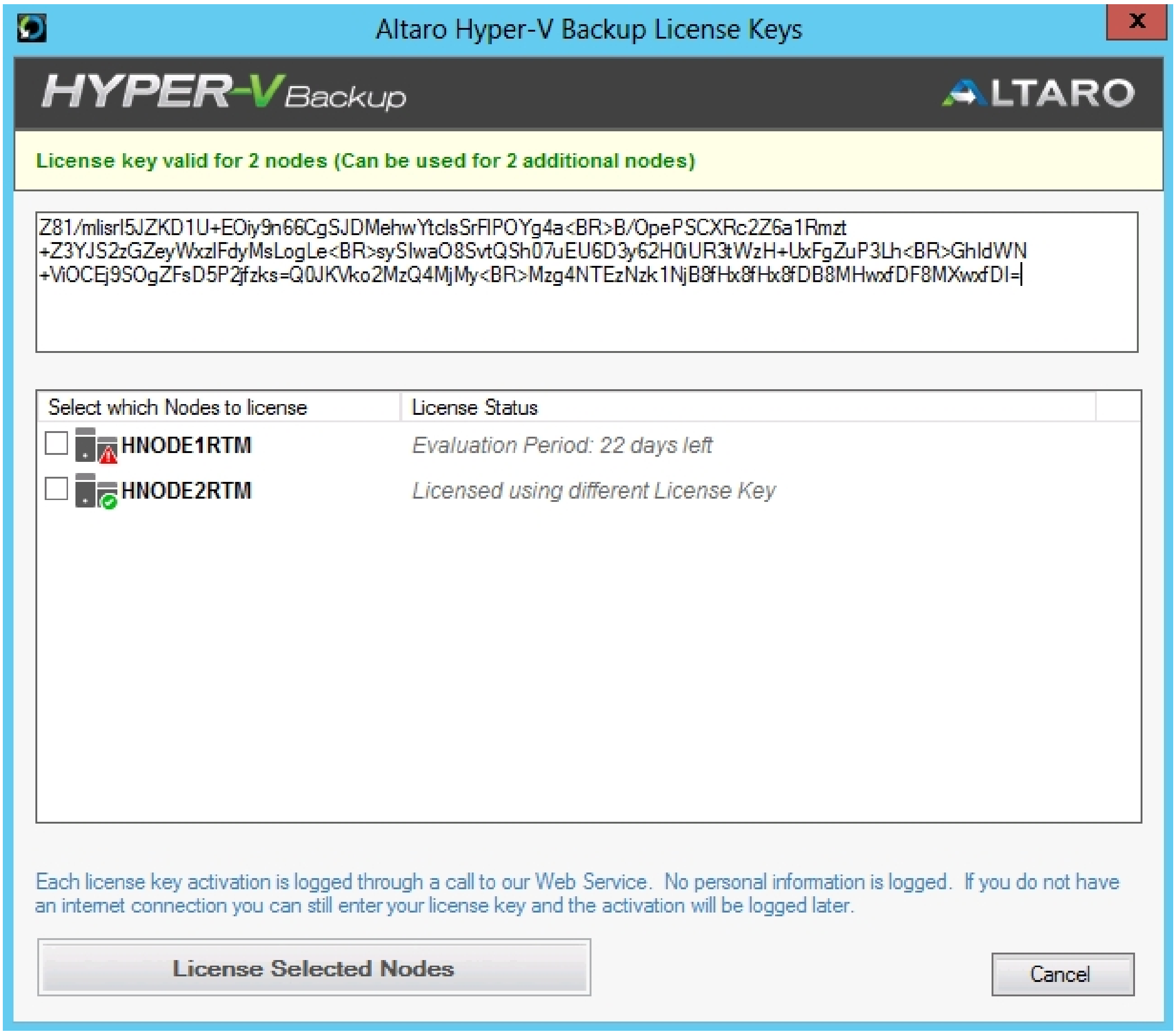
5. Go back to the License Key window, right-click on the white text box and select Paste.

6. Click the button [Verify License Key] to verify your License Key. Once verified the window will change to confirm that the License Key was accepted by thanking you for purchasing the product.

Additional Steps when running under a Hyper-V Cluster Environment:

If a Cluster Environment is detected, then in the steps above, instead of the [Verify License Key] button you will see a [Choose Nodes...] button. This button will bring up the following Window which facilitates the licensing of each Node in the cluster.

Simply use the checkboxes in the list to identify which Nodes you would like to license. The number of Nodes allowed is dependent on the number of activations allowed by the License Key.



License key valid for 2 nodes (Can be used for 2 additional nodes)

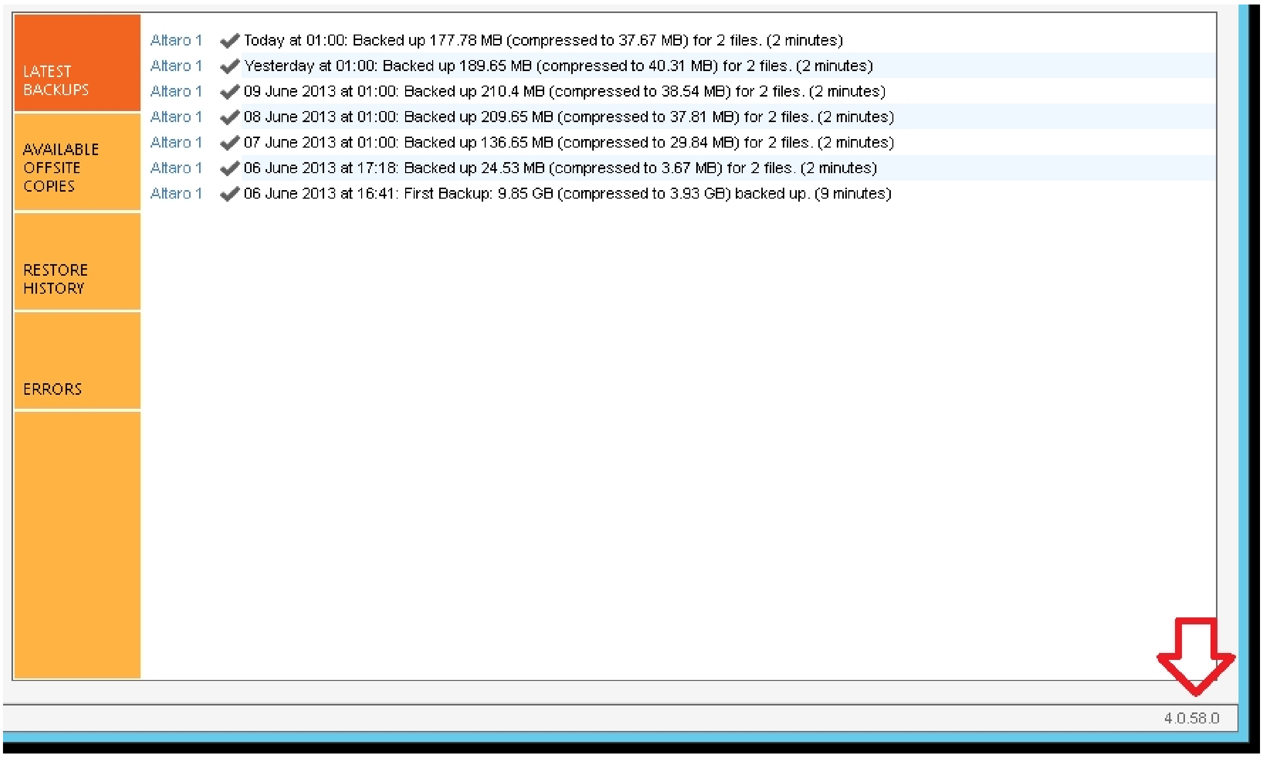
Z81/mlisrl5JZKD1U+EOiy9n66CgSJDMehwYtclsSrFlPOYg4a<BR>B/OpePSCXRc2Z6a1Rmzt
+Z3YJS2zGZeyWxzlFdyMsLogLe<BR>sySIwaO8SvtQSh07uEU6D3y62H0iUR3tWzH+UxFgZuP3Lh<BR>GhIdWN
+ViOCEj9SOgZFsD5P2jfzks=Q0JKVko2MzQ4MjMy<BR>Mzg4NTEzNzk1NjB8fHx8fHx8fDB8MHwxfDF8MXwxfDI=

Select which Nodes to license	License Status
□ HNODE1RTM	*Evaluation Period: 22 days left*
□ HNODE2RTM	*Licensed using different License Key*

Each license key activation is logged through a call to our Web Service. No personal information is logged. If you do not have an internet connection you can still enter your license key and the activation will be logged later.

Checking which version is installed

Checking which version of Altaro Hyper-V Backup is installed is easy. Simply launch the Management Console by clicking on the **Altaro Hyper-V Backup** Start Menu item and check for the version number at the bottom right hand side of the Window.



Altaro 1 ✓ Today at 01:00: Backed up 177.78 MB (compressed to 37.67 MB) for 2 files. (2 minutes)
Altaro 1 ✓ Yesterday at 01:00: Backed up 189.65 MB (compressed to 40.31 MB) for 2 files. (2 minutes)
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Altaro 1 ✓ 06 June 2013 at 16:41: First Backup: 9.85 GB (compressed to 3.93 GB) backed up. (9 minutes)

In the example above version 4.0.58 is installed.

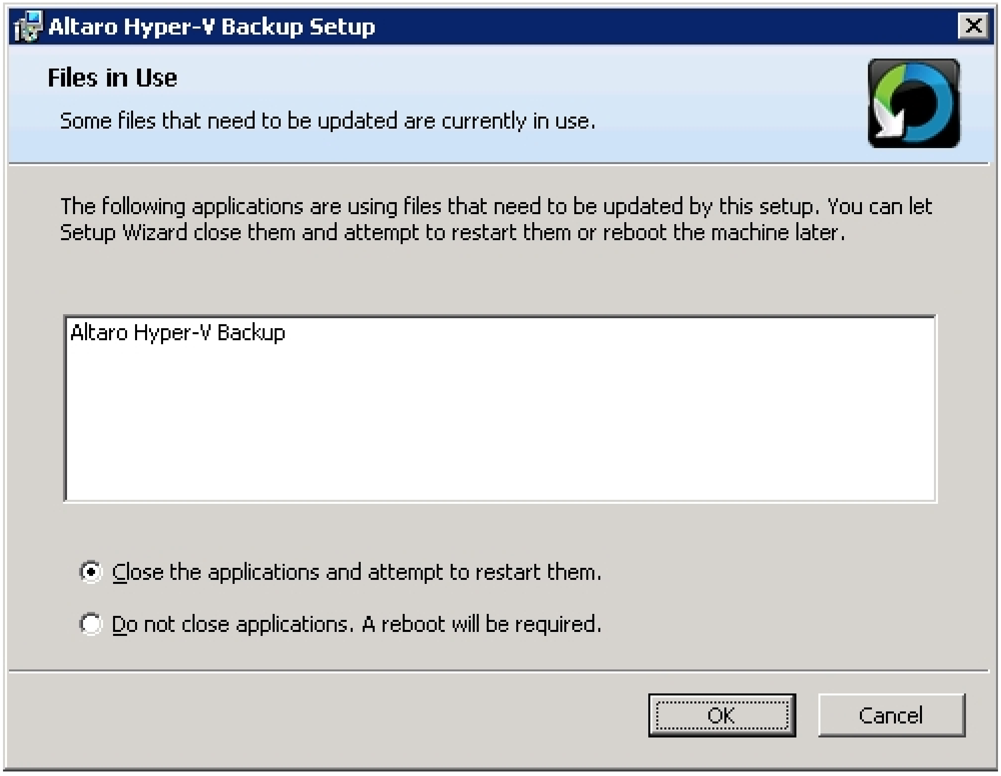
Upgrading to a new build

To upgrade Altaro Hyper-V Backup please follow the following three steps:

1. Exit the Altaro Hyper-V Backup Management Console from the top right control box.
2. Download the latest version of Altaro Hyper-V Backup from http://www.altaro.com/hyper-v-backup/download_update.php
3. Launch the installer and follow the Installing Altaro Hyper-V Backup.

Your old backup settings, backup history and license key information will be migrated to the new version.

Important Note: The only difference between a first time installation and an upgrade is that the management console must be closed before attempting to upgrade. If the installer detects that the management console is running then you will be prompted to close it with the following dialog box.



Altaro Hyper-V Backup Setup

Files in Use

Some files that need to be updated are currently in use.

The following applications are using files that need to be updated by this setup. You can let Setup Wizard close them and attempt to restart them or reboot the machine later.

Altaro Hyper-V Backup

● Close the applications and attempt to restart them.

○ Do not close applications. A reboot will be required.

Uninstalling Altaro Hyper-V Backup

Important Note: Uninstalling **Altaro Hyper-V Backup** will only remove the software from your Server. Any backup data and settings created during usage of the application will be left on the Server and Backup Drive. This is important in case you need to restore data in the future.

Method 1: Using the Uninstall a program feature under the Windows Control Panel

1. Click Start, then on Settings, then click Control Panel.

2. In Control Panel select **[Uninstall a program]**.

3. Once the window opens up you'll see a listing of the programs you have installed on your computer.

4. Highlight Altaro Hyper-V Backup and click **[Remove]** or **[Uninstall].**

5. The program will begin to uninstall and will ask you for confirmation.

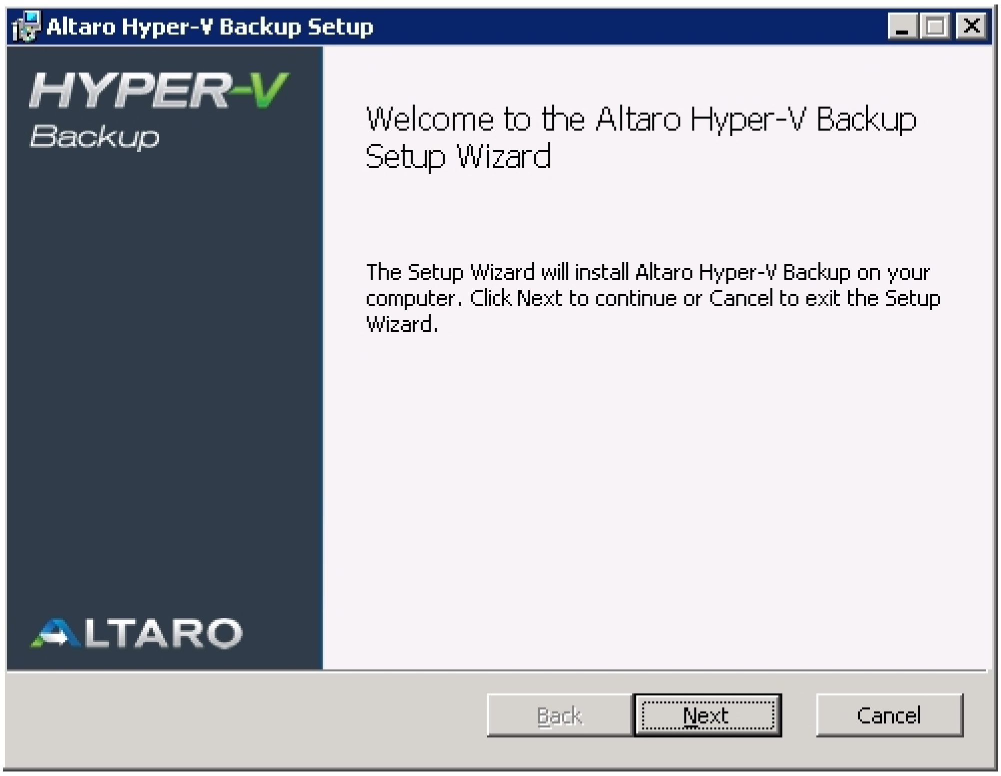
6. When the uninstall is completed you'll notice that it is no longer visible in the program list.

7. Close the dialog, and close the Control Panel.

Method 2: Using the original Altaro Hyper-V Backup installer

1. Launch the original installer: **altarohypervbackupsetup.exe**. On certain Operating Systems you may receive a warning informing you that certain downloads may be unsafe. Our software is signed using Altaro's digital signature and therefore this warning can be ignored.

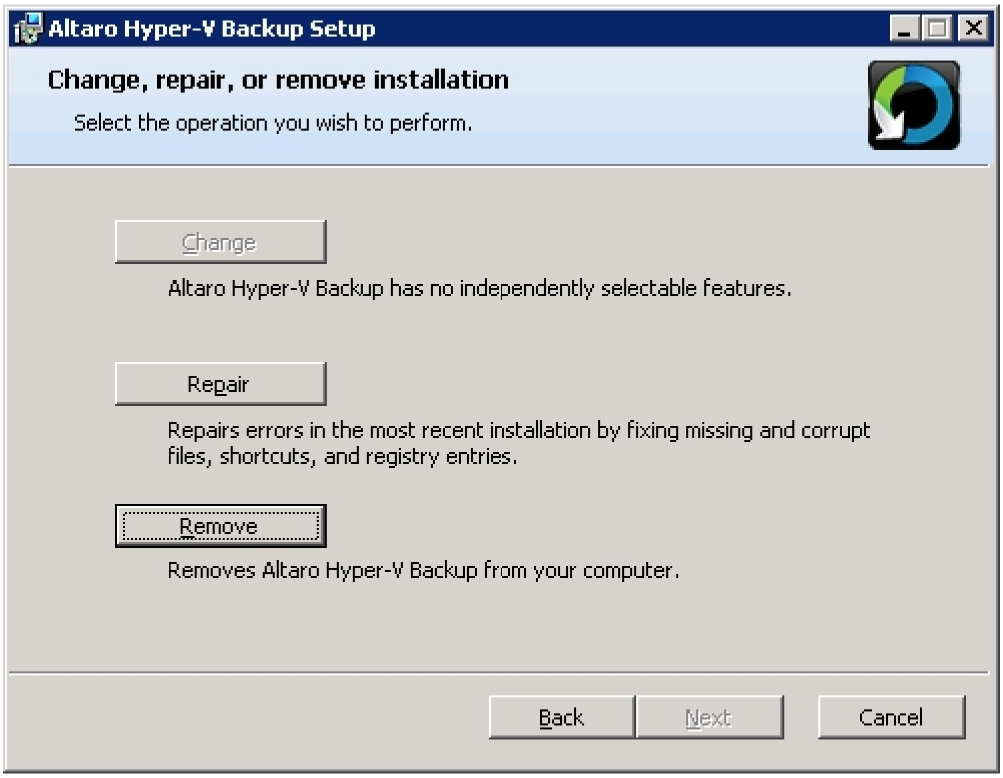
2. Next you will be presented with the welcome screen of the installer. Simply click [Next].



Welcome to the Altaro Hyper-V Backup Setup Wizard

The Setup Wizard will install Altaro Hyper-V Backup on your computer. Click Next to continue or Cancel to exit the Setup Wizard.

3. You will now see a screen with three options. At this point please choose the [Remove] option.



Altaro Hyper-V Backup Setup

Change, repair, or remove installation

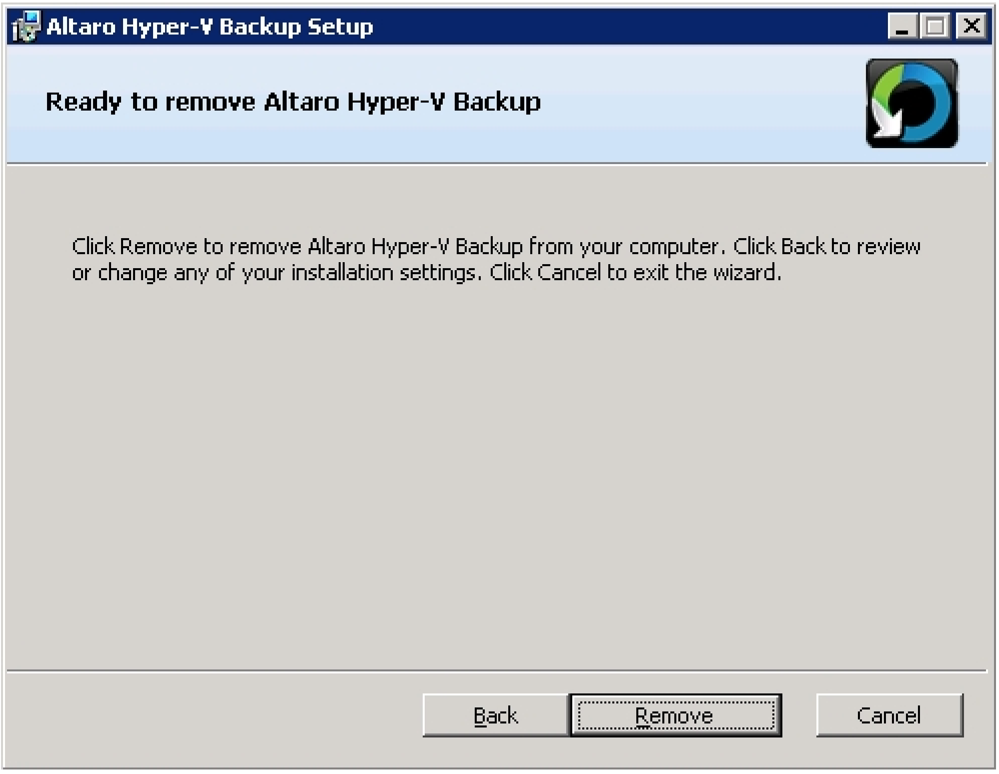
Select the operation you wish to perform.

Altaro Hyper-V Backup has no independently selectable features.

Repairs errors in the most recent installation by fixing missing and corrupt files, shortcuts, and registry entries.

Removes Altaro Hyper-V Backup from your computer.

4. You will now be prompted with a confirmation to remove Altaro Hyper-V Backup. Please choose [Remove] again.

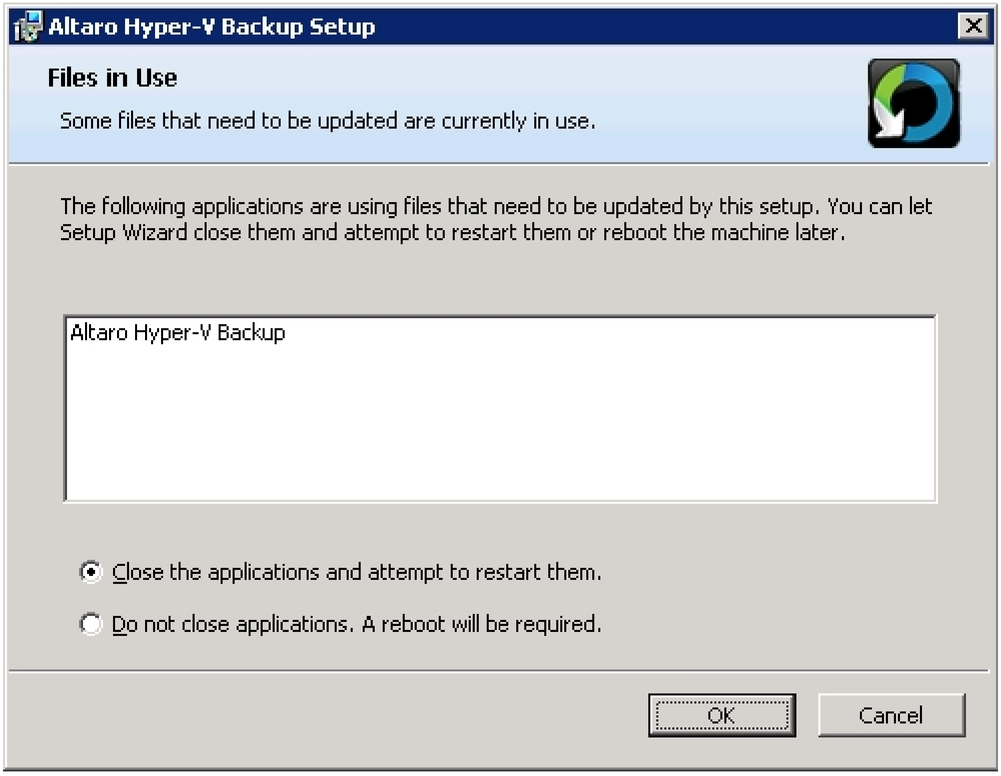


Altaro Hyper-V Backup Setup

Ready to remove Altaro Hyper-V Backup

Click Remove to remove Altaro Hyper-V Backup from your computer. Click Back to review or change any of your installation settings. Click Cancel to exit the wizard.

5. If the Hyper-V Backup **Management Console** is running you will be prompted to close it. Please close it and proceed.



Altaro Hyper-V Backup Setup

Files in Use

Some files that need to be updated are currently in use.

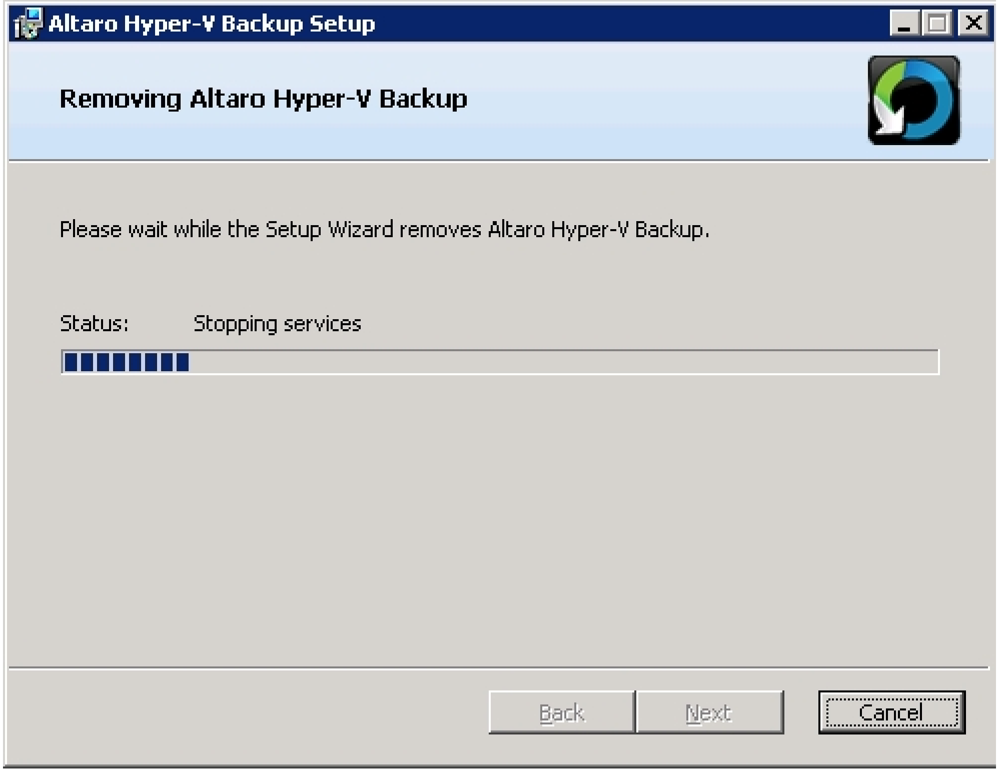
The following applications are using files that need to be updated by this setup. You can let Setup Wizard close them and attempt to restart them or reboot the machine later.

Altaro Hyper-V Backup

● Close the applications and attempt to restart them.

○ Do not close applications. A reboot will be required.

6. The uninstall progress will be displayed now. This should only take a few seconds.



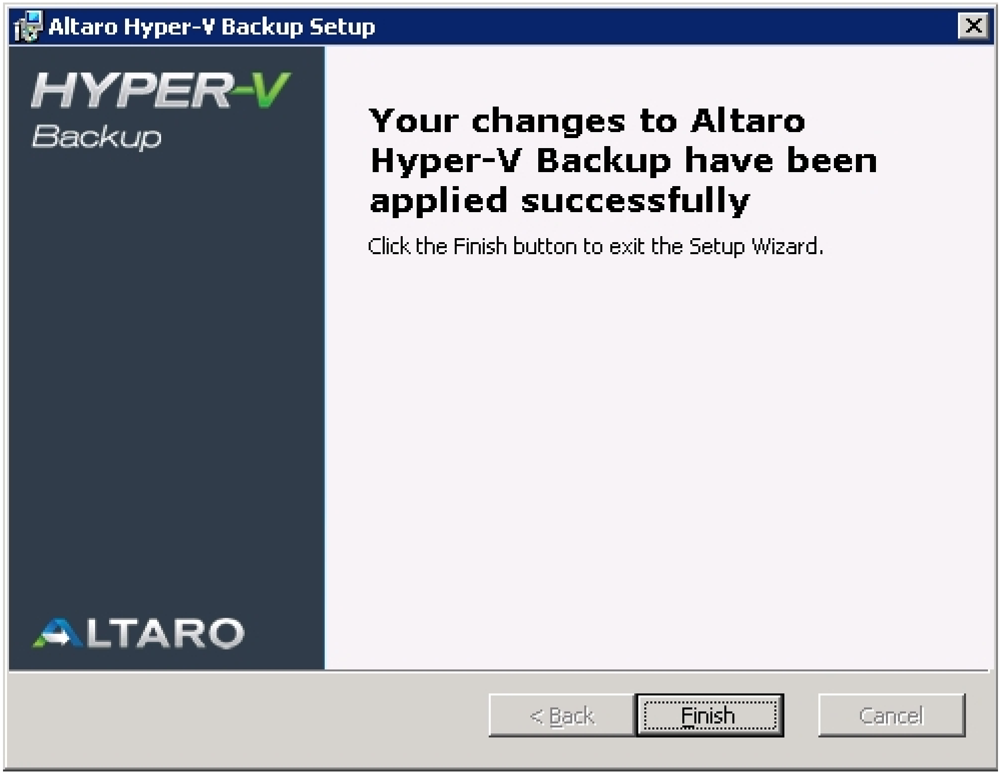
Altaro Hyper-V Backup Setup

Removing Altaro Hyper-V Backup

Please wait while the Setup Wizard removes Altaro Hyper-V Backup.

Status: Stopping services

7. Once Hyper-V Backup has been removed completely from your Server you will be presented with the following screen.



Altaro Hyper-V Backup Setup

Your changes to Altaro Hyper-V Backup have been applied successfully

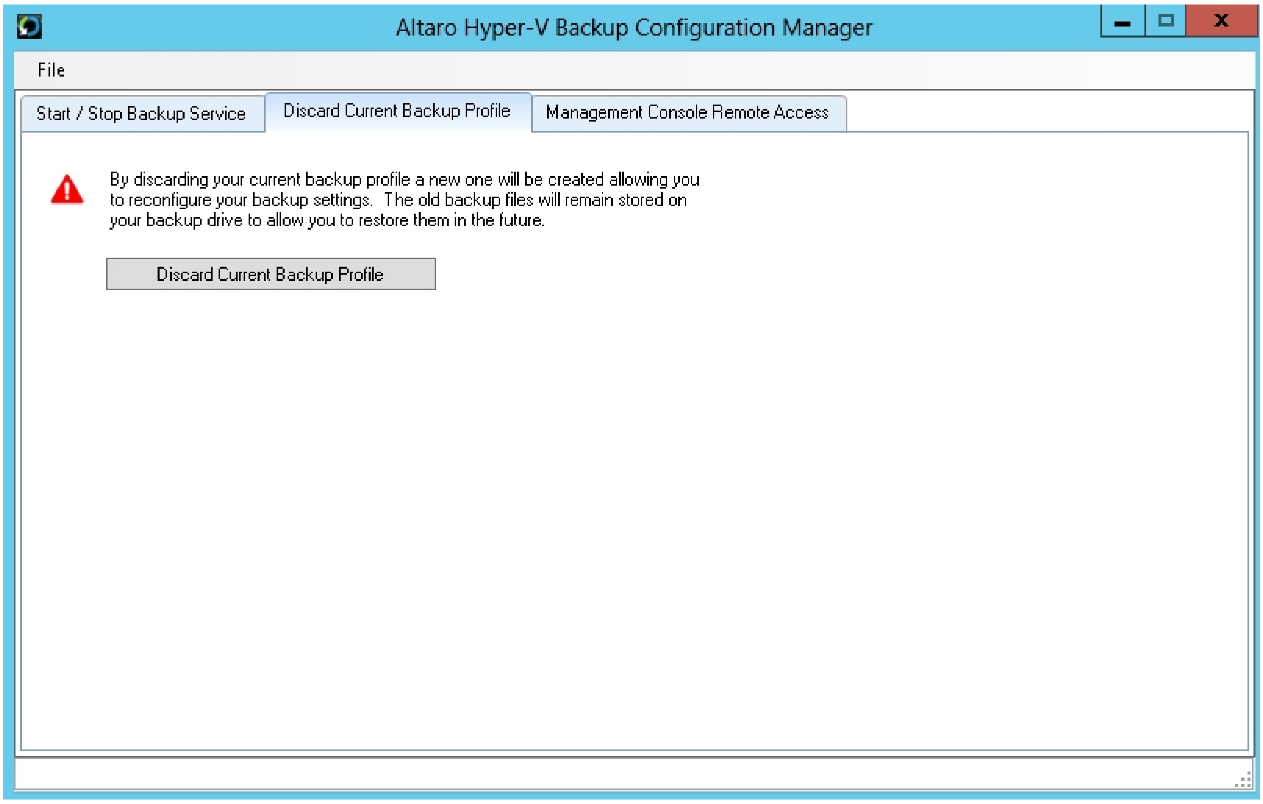
Click the Finish button to exit the Setup Wizard.

Should a screen informing you that the changes have failed appear please contact support.

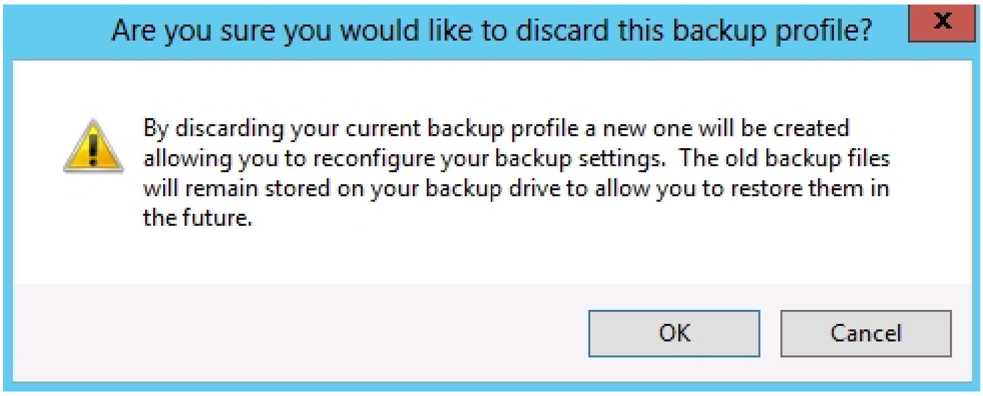
Restart Backup From Scratch

To start backing up again from scratch you can simply use the "Discard Current Backup Profile" feature in the **Altaro Hyper-V Backup Configuration Manager**. You can learn how to access the Configuration Manager here.

Discard Current Backup Profile: This tab allows the user to discard the current backup profile and start a new one. Once the old backup profile is discarded, Hyper-V Backup can be reconfigured using the Management Console as described here.


Altaro Hyper-V Backup Configuration Manager
File
Start / Stop Backup Service
Discard Current Backup Profile
Management Console Remote Access
Discard Current Backup Profile

By discarding your current backup profile a new one will be created allowing you to reconfigure your backup settings. The old backup files will remain stored on your backup drive to allow you to restore them in the future.



By discarding your current backup profile a new one will be created allowing you to reconfigure your backup settings. The old backup files will remain stored on your backup drive to allow you to restore them in the future.

Configuration - Quick Start

Installing Altaro Hyper-V Backup in a Hyper-V Cluster (CSV) Environment

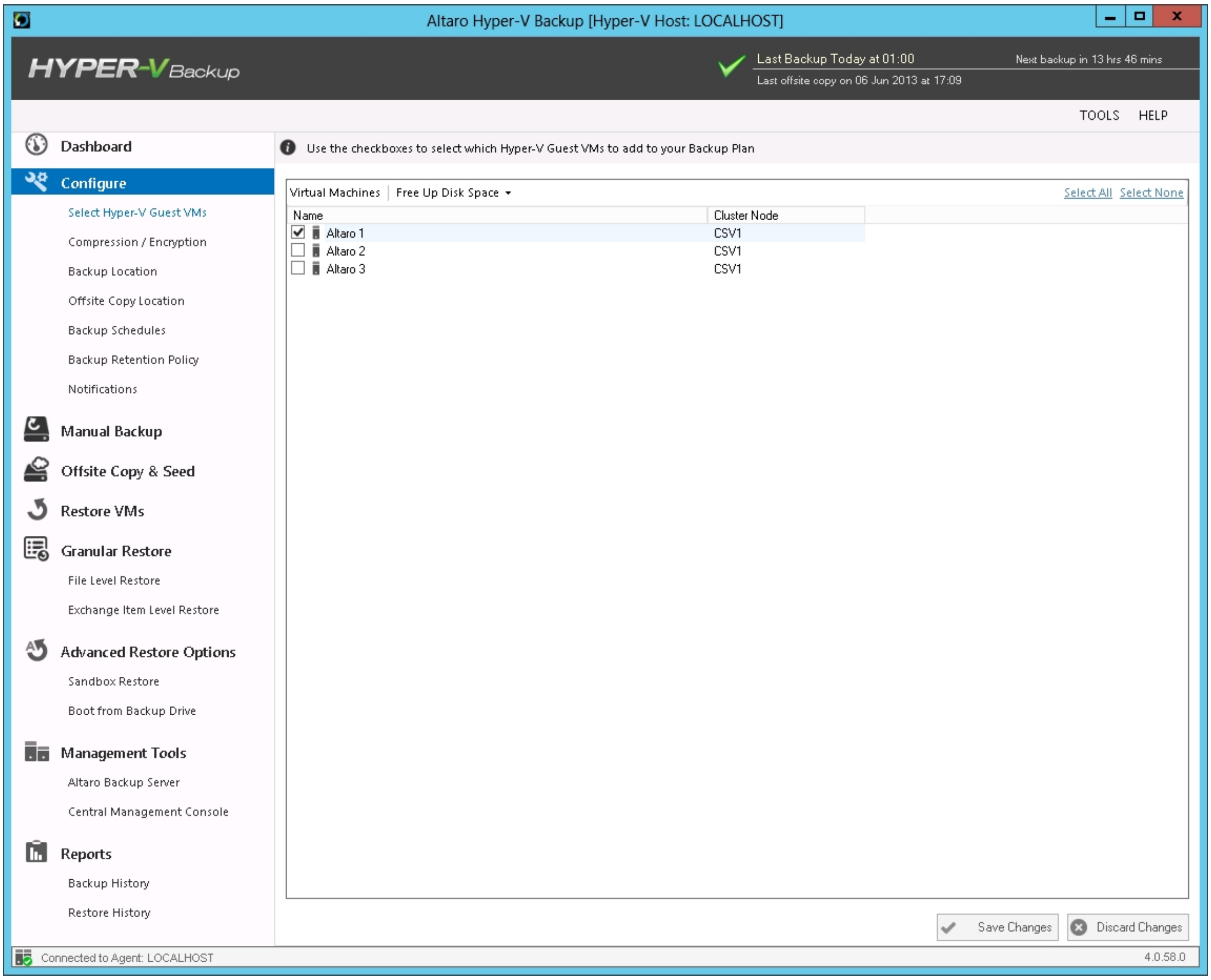
Instructions for setting up Altaro Hyper-V Backup within a Cluster Environment

Altaro Hyper-V Backup First Run

Note: At any point during the evaluation you will be able to enter a License Key to activate a Hyper-V Backup Edition. If you choose not to purchase the software then you can activate the free Express Edition at the end of the Evaluation period. Read instructions on entering your license key here.

The first time that you run Altaro Hyper-V Backup the **Management Console** will launch into a special configuration mode. This will help you to:

1. Select which Hyper-V Guest VMs you would like to backup. Read instructions here.
2. Select which Backup Drive to back up to. Read instructions here.
3. Enable and disable backup and restore notifications. Read instructions here.



Last Backup Today at 01:00

Next backup in 13 hrs 46 mins

Last offsite copy on 06 Jun 2013 at 17:09

Use the checkboxes to select which Hyper-V Guest VMs to add to your Backup Plan

Name	Cluster Node
☑ Altaro 1	CSV1
□ Altaro 2	CSV1
□ Altaro 3	CSV1

Connected to Agent: LOCALHOST

4.0.58.0

Opening the Management Console

The **Management Console** is opened automatically after you first install **Altaro Hyper-V Backup**.

After this you can launch it easily using one of the following methods:

- Clicking on the **Altaro Hyper-V Backup** item within the *"Start Menu > All Programs > Altaro"* group.
- Launching "Altaro Hyper-V Backup.exe" application from the install location. By default this is *"C:*

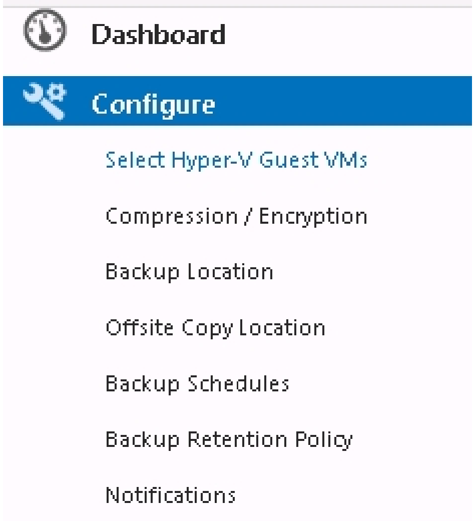
\Program Files\Altaro\Altaro Hyper-V Backup".

- Enter the command **STARTALTARO** into a command prompt window. This may not work immediately after first install until you log out and in to the Server due to the Environment Variables not being refreshed.
- If the **Management Console** is already running in the background simply double click on the Altaro Hyper-V Backup System Tray icon.

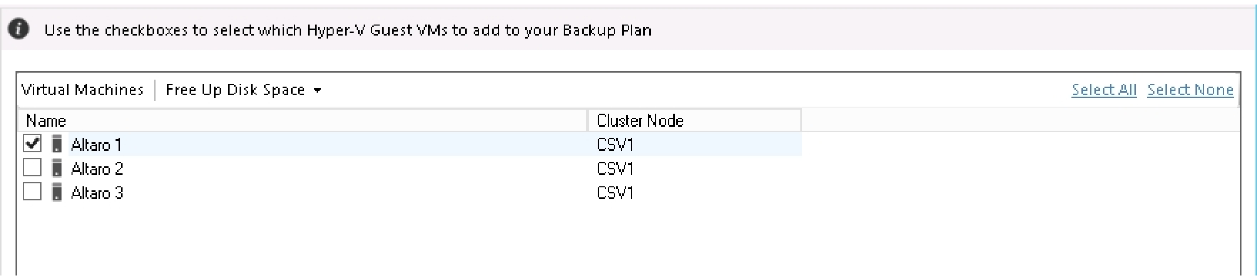
Choosing VMs to back up

To select which Hyper-V Guest VMs to backup simply open the **Management Console** and select the option **[Select Hyper-V Guest VMs]** from the left hand side main menu.

Read instructions on how to open the Management Console here.



1. Once you select "Step 1" you will be presented with the following panel:



Use the checkboxes to select which Hyper-V Guest VMs to add to your Backup Plan

Name	Cluster Node
☑ Altaro 1	CSV1
□ Altaro 2	CSV1
□ Altaro 3	CSV1

2. Simply use the checkboxes to select which Hyper-V Guest VMs you would like to add to your backup plan.

- You can return to this screen at any time to add / remove Hyper-V Guest VMs.
- The selected VMs will not be backed up automatically until you setup a backup schedule or take a manual backup.
- Hyper-V Guests that have been deleted from the Hyper-V Host but have already been backed up will continue to show up in this list.

3. Once the selections have been made simply click on '**Save Changes**' to update your backup plan.

Selecting VMs on another Node within the Cluster:

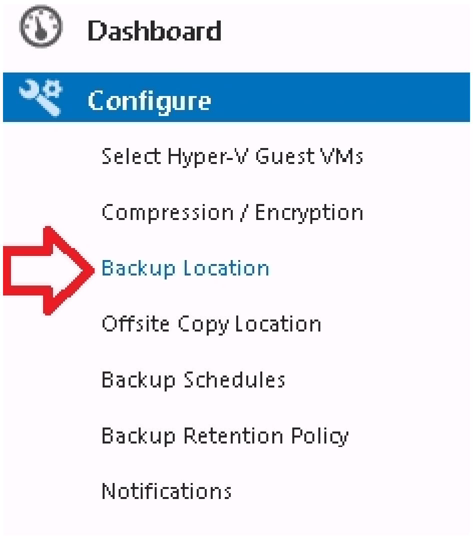
If you wish to select VMs for backup which are currently hosted upon another Node within the cluster, you simply select them using the same steps above. The user interface will be a bit different within a cluster environment and you can read further instructions here.

You must have first configured Altaro Hyper-V correctly for Cluster Support as explained here.

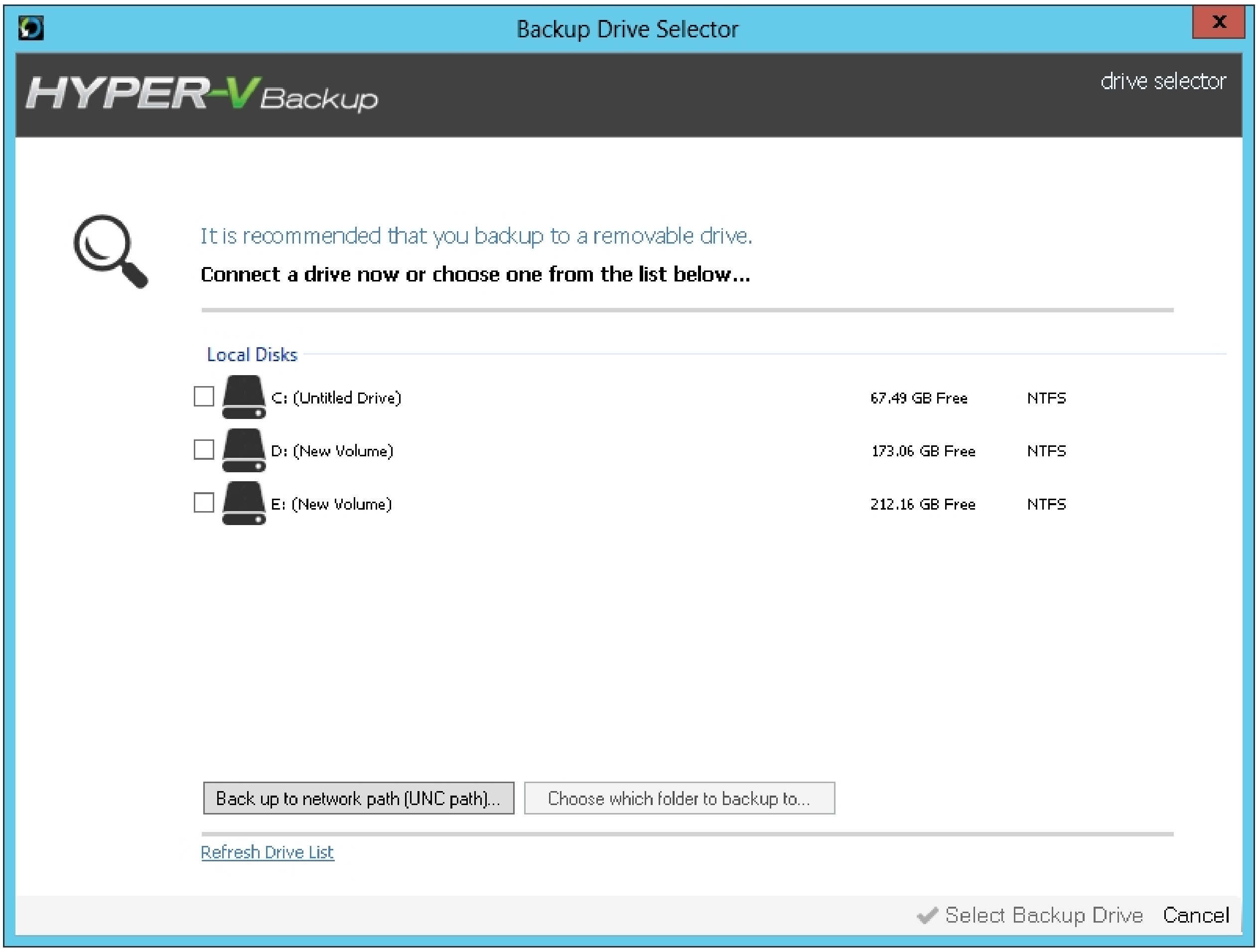
Selecting Backup Drive

To select a drive or network path as your backup destination, open the **Management Console** and select the option '**Backup Location'** from the left hand side menu.

Read instructions on how to open the Management Console here.



Your current backup drive will be shown on the right, to change it click **'Change Selected Drive'** and you will be presented with the following prompt:



It is recommended that you backup to a removable drive.

Connect a drive now or choose one from the list below...

Local Disks

□ C: (Untitled Drive)	67.49 GB Free	NTFS
□ D: (New Volume)	173.06 GB Free	NTFS
□ E: (New Volume)	212.16 GB Free	NTFS

2. Here, select your backup drive from the list and click **'Select Backup Drive'** to complete.

   - For instructions on configuring a backup drive click here.
   - For instructions on backing up to UNC network paths click here.

3. Once the selections have been made there is no need to click save as changes are saved automatically.

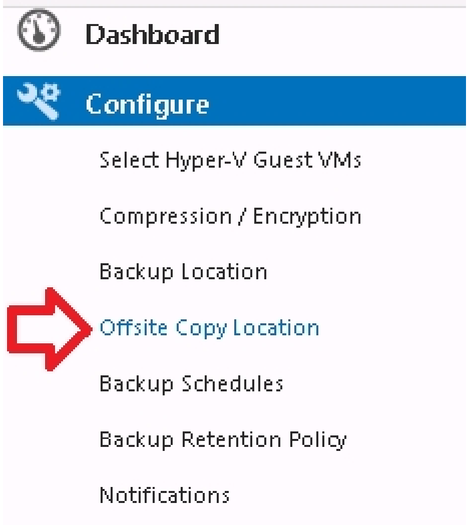
Selecting a Backup Drive within a Cluster Environment:

An additional step is required to share the backup drive with any Altaro Agents upon other nodes as explained here.

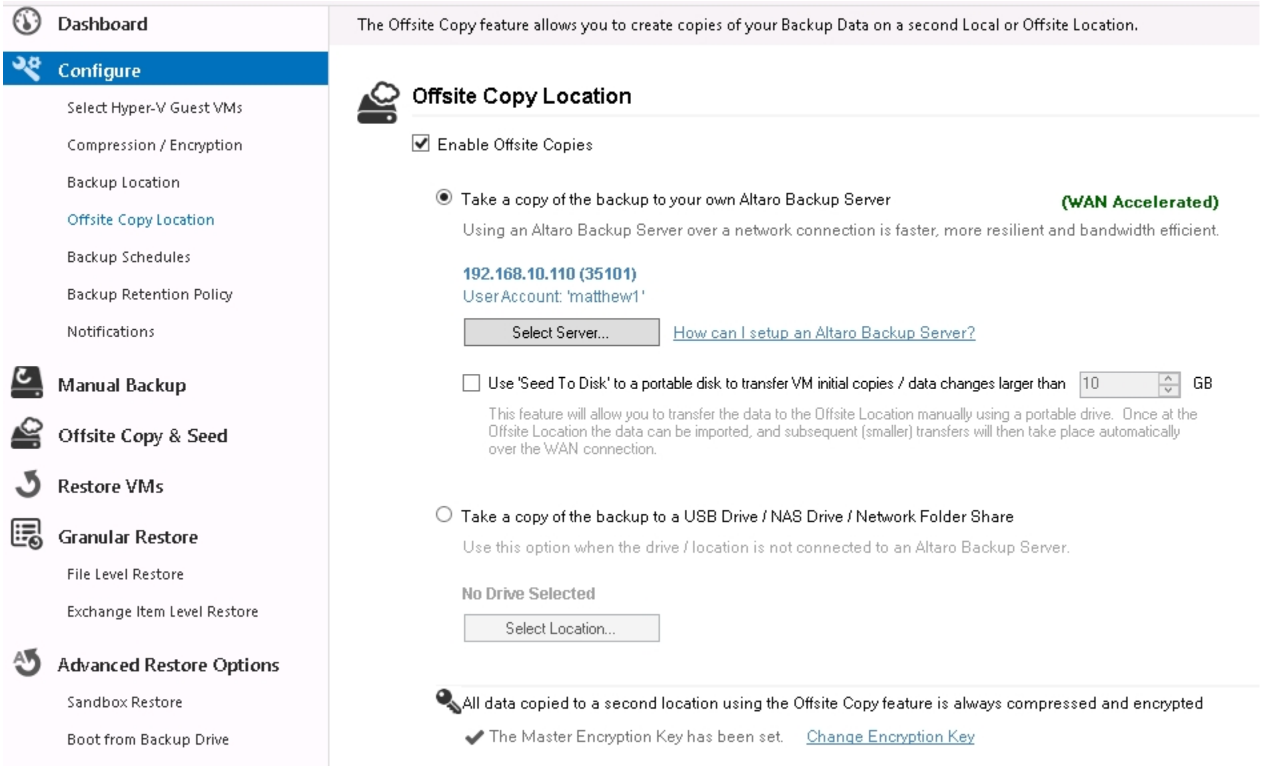
Selecting Offsite Copy Location

To select an Altaro Backup Server or a local or network path as your Offsite backup destination, open the **Management Console** and select the option '**Offsite Copy Location'** from the left hand side menu.

Read instructions on how to open the Management Console here.



On the right hand side you will be shown a screen allowing you to choose what option you would like for your offsite copies as below:



The Offsite Copy feature allows you to create copies of your Backup Data on a second Local or Offsite Location.

Offsite Copy Location

☑ Enable Offsite Copies

● Take a copy of the backup to your own Altaro Backup Server (WAN Accelerated)

Using an Altaro Backup Server over a network connection is faster, more resilient and bandwidth efficient.

192.168.10.110 (35101)
User Account: 'matthew1'

Select Server... How can I setup an Altaro Backup Server?

□ Use 'Seed To Disk' to a portable disk to transfer VM initial copies / data changes larger than 10 GB

This feature will allow you to transfer the data to the Offsite Location manually using a portable drive. Once at the Offsite Location the data can be imported, and subsequent (smaller) transfers will then take place automatically over the WAN connection.

○ Take a copy of the backup to a USB Drive / NAS Drive / Network Folder Share

Use this option when the drive / location is not connected to an Altaro Backup Server.

No Drive Selected

Select Location...

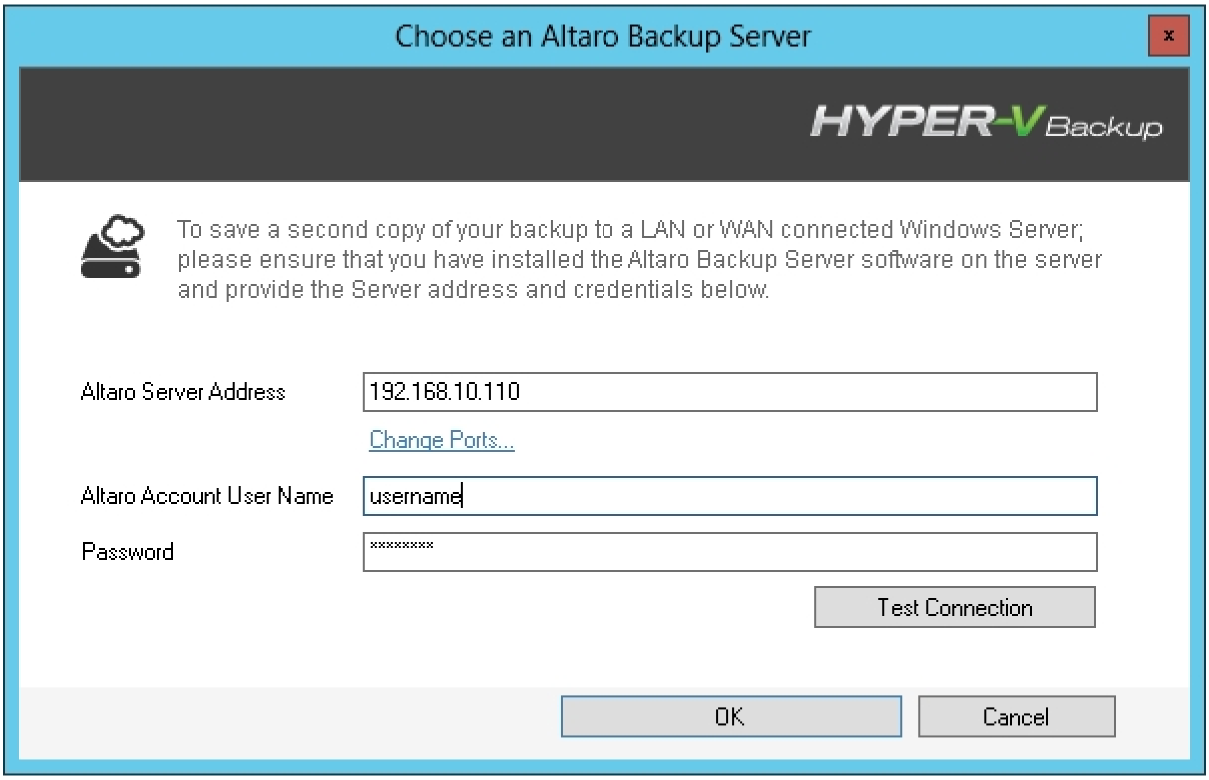
All data copied to a second location using the Offsite Copy feature is always compressed and encrypted

✓ The Master Encryption Key has been set. Change Encryption Key

Offsite Copy to an Altaro Backup Server

To back up to an offsite Altaro Backup Server, select the first option called "**Take a copy of the backup to your own Altaro Backup Server**"

Then Click the '**Select Server**' button and you will be prompted to enter the details of your Altaro Backup server as below:



To save a second copy of your backup to a LAN or WAN connected Windows Server; please ensure that you have installed the Altaro Backup Server software on the server and provide the Server address and credentials below.

Altaro Server Address: 192.168.10.110

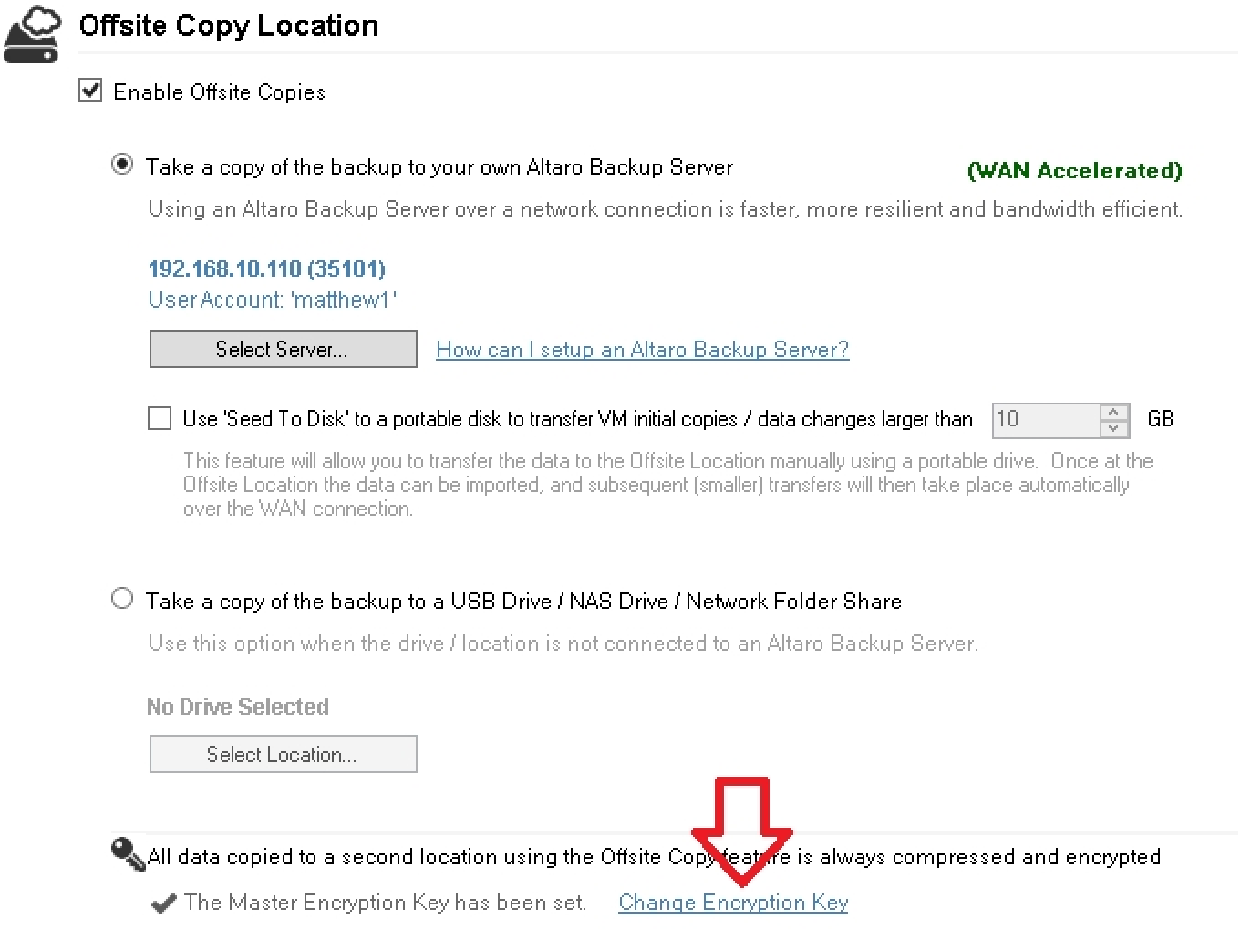
Altaro Account User Name: username

Password: ********

Enter the details of your Altaro Backup server and click **OK**

For more information about configuring an Altaro Backup Server click here

Once you have selected your server, you must also configure an Encryption key for your offsite backups. To do so, click the **'Change Encryption Key'** link at the bottom of the screen.



Offsite Copy Location

☑ Enable Offsite Copies

● Take a copy of the backup to your own Altaro Backup Server (WAN Accelerated)

Using an Altaro Backup Server over a network connection is faster, more resilient and bandwidth efficient.

192.168.10.110 (35101)
User Account: 'matthew1'

☐ Use 'Seed To Disk' to a portable disk to transfer VM initial copies / data changes larger than 10 GB

This feature will allow you to transfer the data to the Offsite Location manually using a portable drive. Once at the Offsite Location the data can be imported, and subsequent (smaller) transfers will then take place automatically over the WAN connection.

○ Take a copy of the backup to a USB Drive / NAS Drive / Network Folder Share

Use this option when the drive / location is not connected to an Altaro Backup Server.

No Drive Selected

All data copied to a second location using the Offsite Copy feature is always compressed and encrypted

✓ The Master Encryption Key has been set.

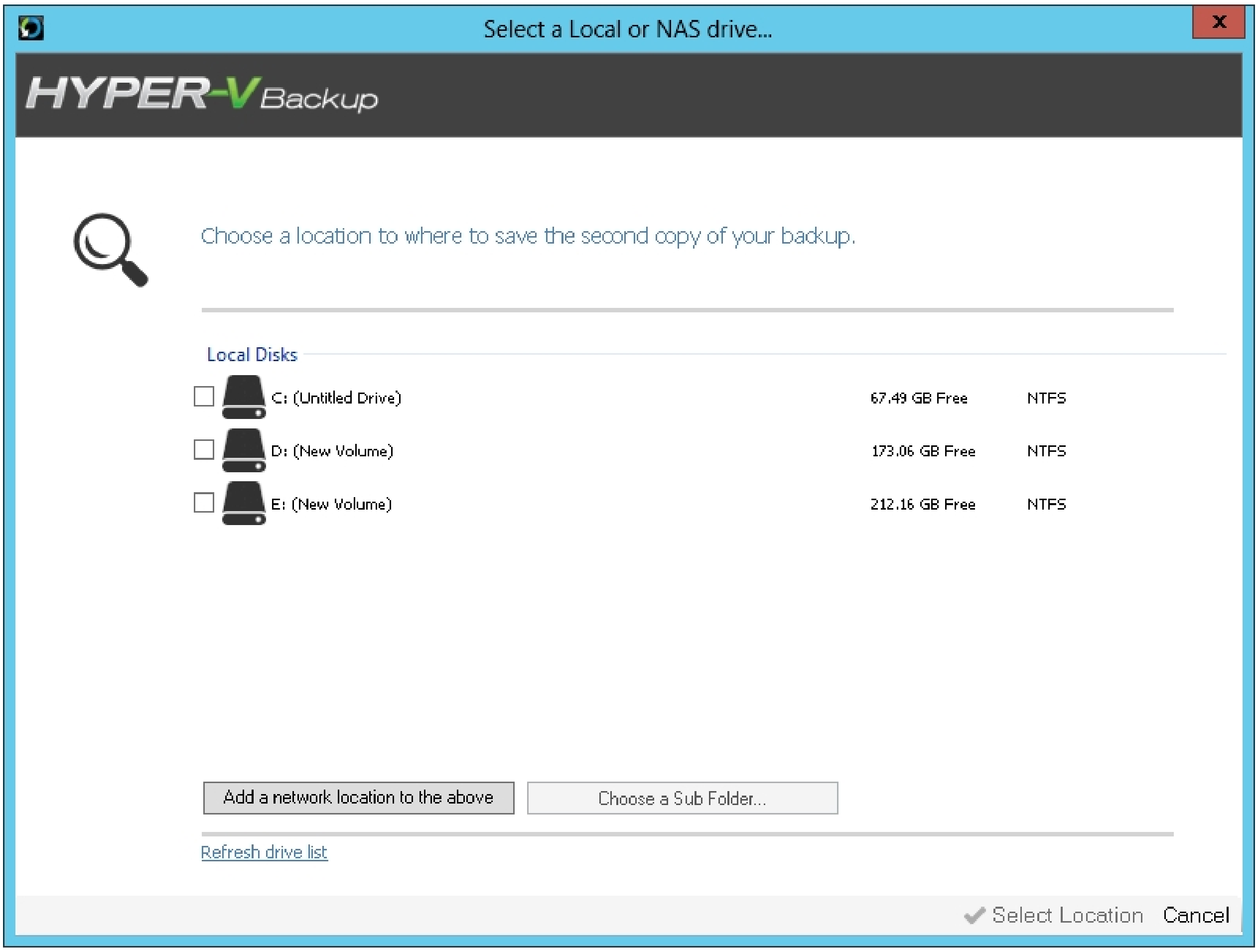
You'll be prompted for an encryption key and a confirmation, then click **OK**

Click **Save Changes** to complete

Offsite Copy to a Local Drive / NAS / Network Share

To back up to an offsite Altaro Backup Server, select the second option called "**Take a copy of the backup to a USB Drive / NAS Drive / Network Folder Share**"

Then Click the **'Select Location**' button and you will be prompted to choose your offsite backup location as below:



Select a Local or NAS drive...
HYPER-V Backup
Choose a location to where to save the second copy of your backup.
Local Disks
Add a network location to the above
Choose a Sub Folder...
Refresh drive list
Select Location
Cancel

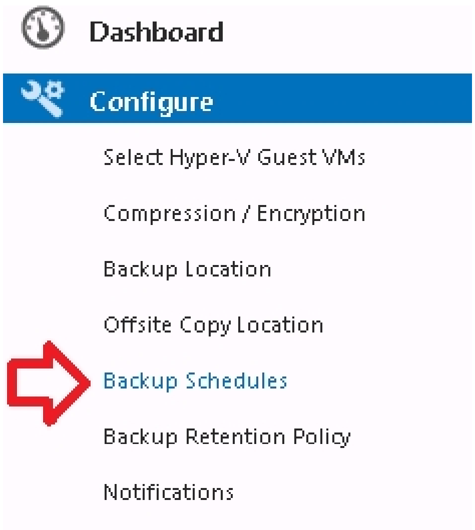
☐	C: (Untitled Drive)	67.49 GB Free	NTFS
☐	D: (New Volume)	173.06 GB Free	NTFS
☐	E: (New Volume)	212.16 GB Free	NTFS

Here (as with the regular Backup Location) you can choose a local or network location to take a copy of your backup to.

Scheduling VM Backups

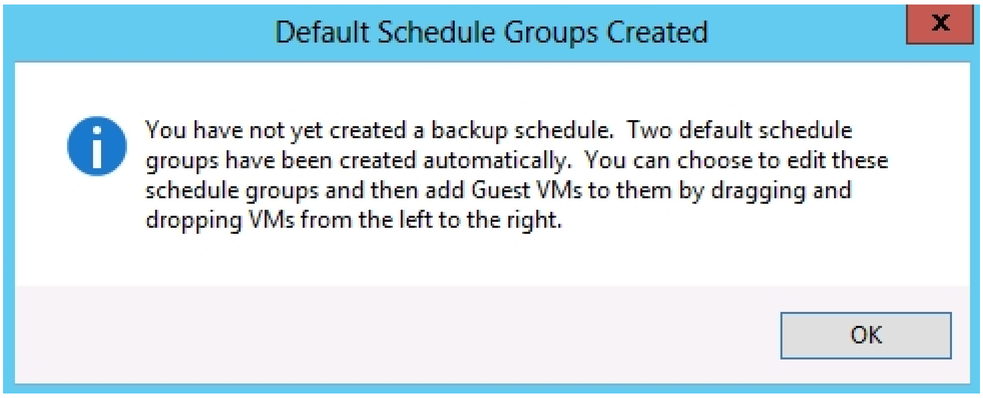
To schedule automatic backups for the selected VMs you need to create a number of Schedule Groups and add the VMs to them. To do this simply open the **Management Console** and select the option "**Backup Schedules"** from the left hand side main menu.

Read instructions on how to open the Management Console here.



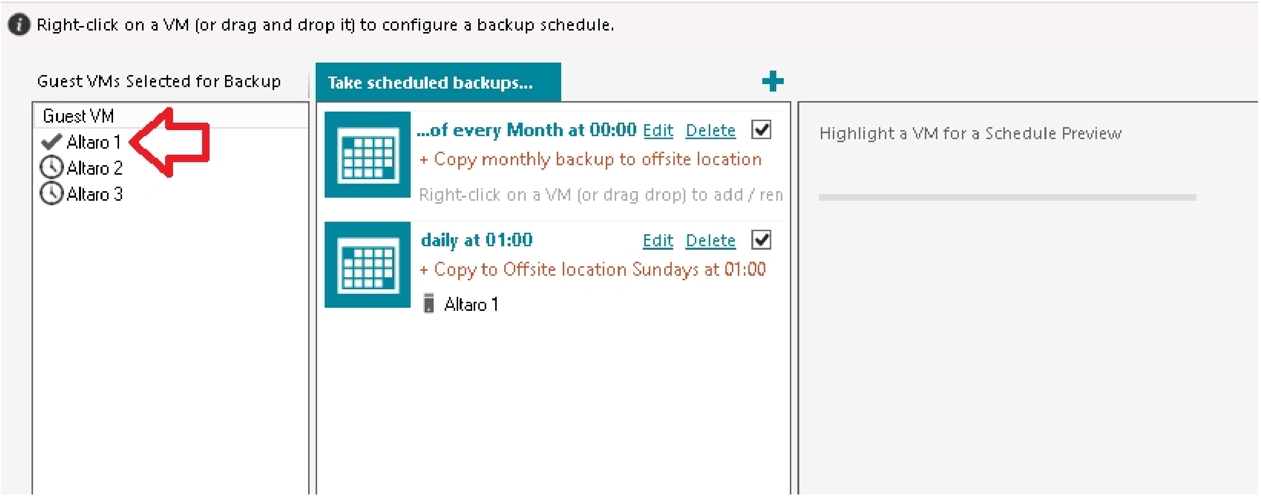
Default Backup Schedule Groups

If you have not yet created any backup schedule groups then two default groups will be created for you. These default groups can be used as they are, edited or deleted. In any case when the default groups are created you will be notified by the following Dialog prompt.


Default Schedule Groups Created

You have not yet created a backup schedule. Two default schedule groups have been created automatically. You can choose to edit these schedule groups and then add Guest VMs to them by dragging and dropping VMs from the left to the right.

Adding a VM to a Schedule Group


Right-click on a VM (or drag and drop it) to configure a backup schedule.

Guest VMs Selected for Backup

Guest VM
✓ Altaro 1
Altaro 2
Altaro 3

Take scheduled backups...

...of every Month at 00:00 Edit Delete ☑
+ Copy monthly backup to offsite location
Right-click on a VM (or drag drop) to add / ren

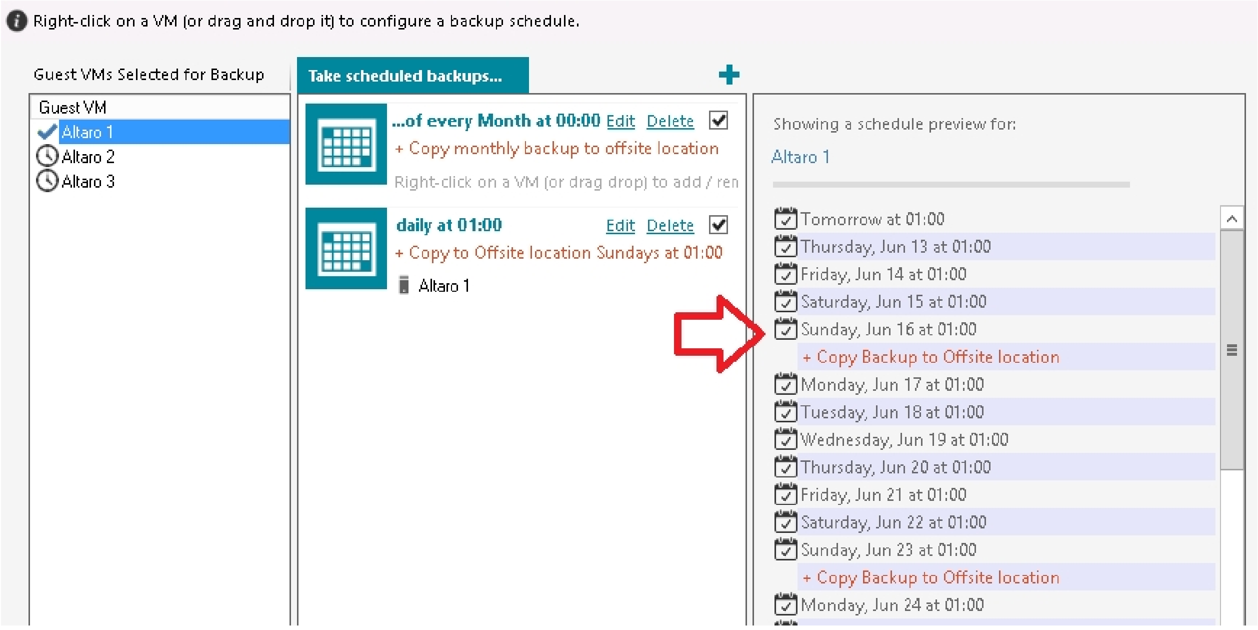
daily at 01:00 Edit Delete ☑
+ Copy to Offsite location Sundays at 01:00
Altaro 1

Highlight a VM for a Schedule Preview

Simply drag a VM (or multiple VMs) from the left hand side panel to the right hand side panel to add it to a Schedule Group. Once the VM is added it will be listed within the Schedule Group panel to indicate that it has been added successfully.

A single VM can be added to multiple schedule groups and a single schedule group can contain multiple VMs.

Selecting a VM on the left hand side will display a Schedule Preview of the current settings for that VM, as shown in the example below:



Right-click on a VM (or drag and drop it) to configure a backup schedule.

Guest VMs Selected for Backup

Guest VM
✓ Altaro 1
Altaro 2
Altaro 3

Take scheduled backups...

...of every Month at 00:00 Edit Delete ☑
+ Copy monthly backup to offsite location
Right-click on a VM (or drag drop) to add / ren

daily at 01:00 Edit Delete ☑
+ Copy to Offsite location Sundays at 01:00
Altaro 1

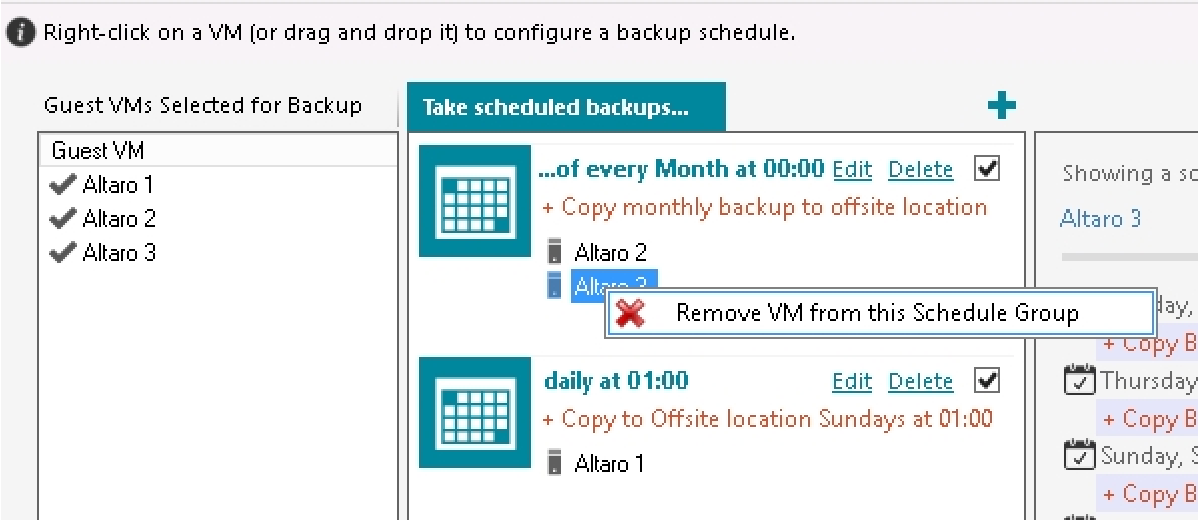
Showing a schedule preview for:
Altaro 1

Tomorrow at 01:00
Thursday, Jun 13 at 01:00
Friday, Jun 14 at 01:00
Saturday, Jun 15 at 01:00
Sunday, Jun 16 at 01:00
+ Copy Backup to Offsite location
Monday, Jun 17 at 01:00
Tuesday, Jun 18 at 01:00
Wednesday, Jun 19 at 01:00
Thursday, Jun 20 at 01:00
Friday, Jun 21 at 01:00
Saturday, Jun 22 at 01:00
Sunday, Jun 23 at 01:00
+ Copy Backup to Offsite location
Monday, Jun 24 at 01:00

You must press **Save Changes** at the bottom of the screen to commit changes.

Removing a VM from a Schedule Group

To remove a VM from a schedule group simply right-click on the VM in the group's VM list and choose "Remove VM from this Schedule Group". The VM can be re-added at any time in the future.



Right-click on a VM (or drag and drop it) to configure a backup schedule.

Guest VMs Selected for Backup

Guest VM
✓ Altaro 1
✓ Altaro 2
✓ Altaro 3

Take scheduled backups...

...of every Month at 00:00 Edit Delete ☑
+ Copy monthly backup to offsite location
Altaro 2
Altaro 3

Remove VM from this Schedule Group

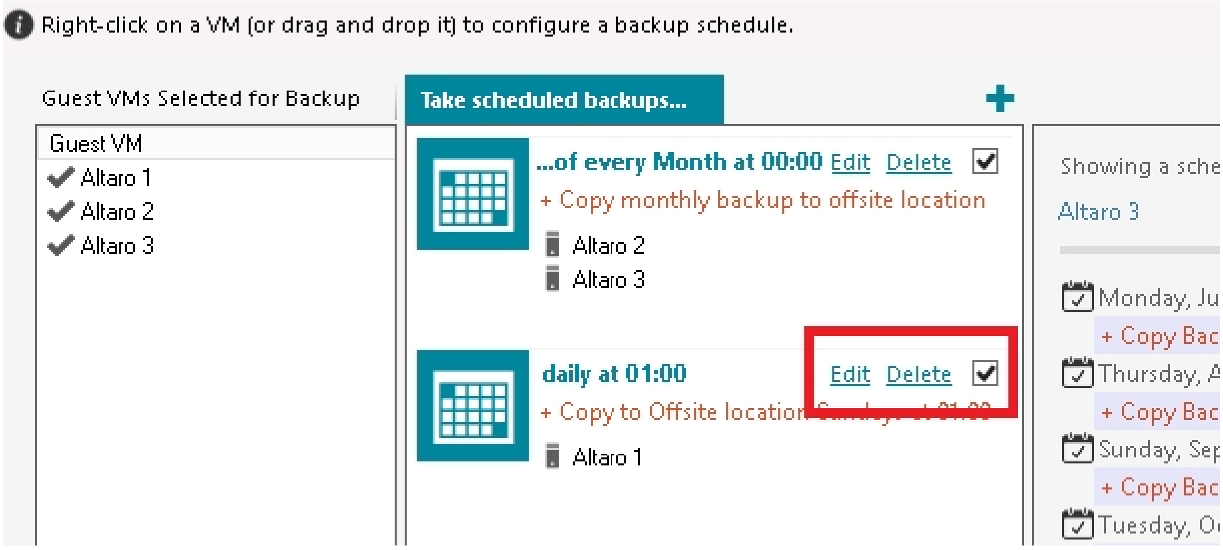
daily at 01:00 Edit Delete ☑
+ Copy to Offsite location Sundays at 01:00
Altaro 1

Showing a sc
Altaro 3

You must press **Save Changes** at the bottom of the screen to commit changes.

Editing / deleting / disabling Schedule Groups

At the top left of each schedule group are three buttons:



Right-click on a VM (or drag and drop it) to configure a backup schedule.

Guest VMs Selected for Backup

Guest VM
- ✓ Altaro 1
- ✓ Altaro 2
- ✓ Altaro 3

Take scheduled backups...

...of every Month at 00:00 Edit Delete ☑
+ Copy monthly backup to offsite location
Altaro 2
Altaro 3

daily at 01:00 Edit Delete ☑
+ Copy to Offsite location Sunday at 01:00
Altaro 1

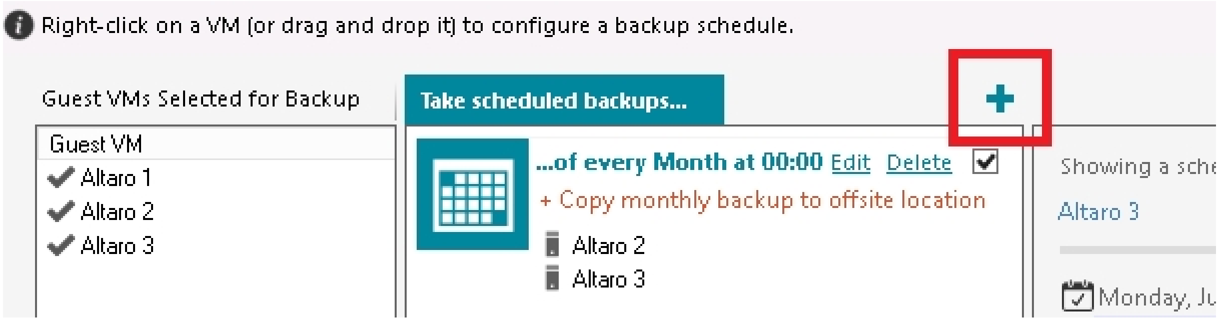
Showing a sche
Altaro 3
Monday, Ju
+ Copy Bac
Thursday, A
+ Copy Bac
Sunday, Sep
+ Copy Bac
Tuesday, O

- Edit - change the schedule group backup schedule.
- Delete - discard the schedule group. Any VMs belonging to it will be unassigned from it first.
- Enabled [y/n] - choose whether the group is active or has been disabled. Backups will not take place for disabled schedule groups.

You must press **Save Changes** at the bottom of the screen to commit changes.

Create a Schedule Group

To create a new schedule group click on the "+" button.



Right-click on a VM (or drag and drop it) to configure a backup schedule.

Guest VMs Selected for Backup

Guest VM
- ✓ Altaro 1
- ✓ Altaro 2
- ✓ Altaro 3

Take scheduled backups... +

...of every Month at 00:00 Edit Delete ☑
+ Copy monthly backup to offsite location
Altaro 2
Altaro 3

Showing a sche
Altaro 3
Monday, Ju

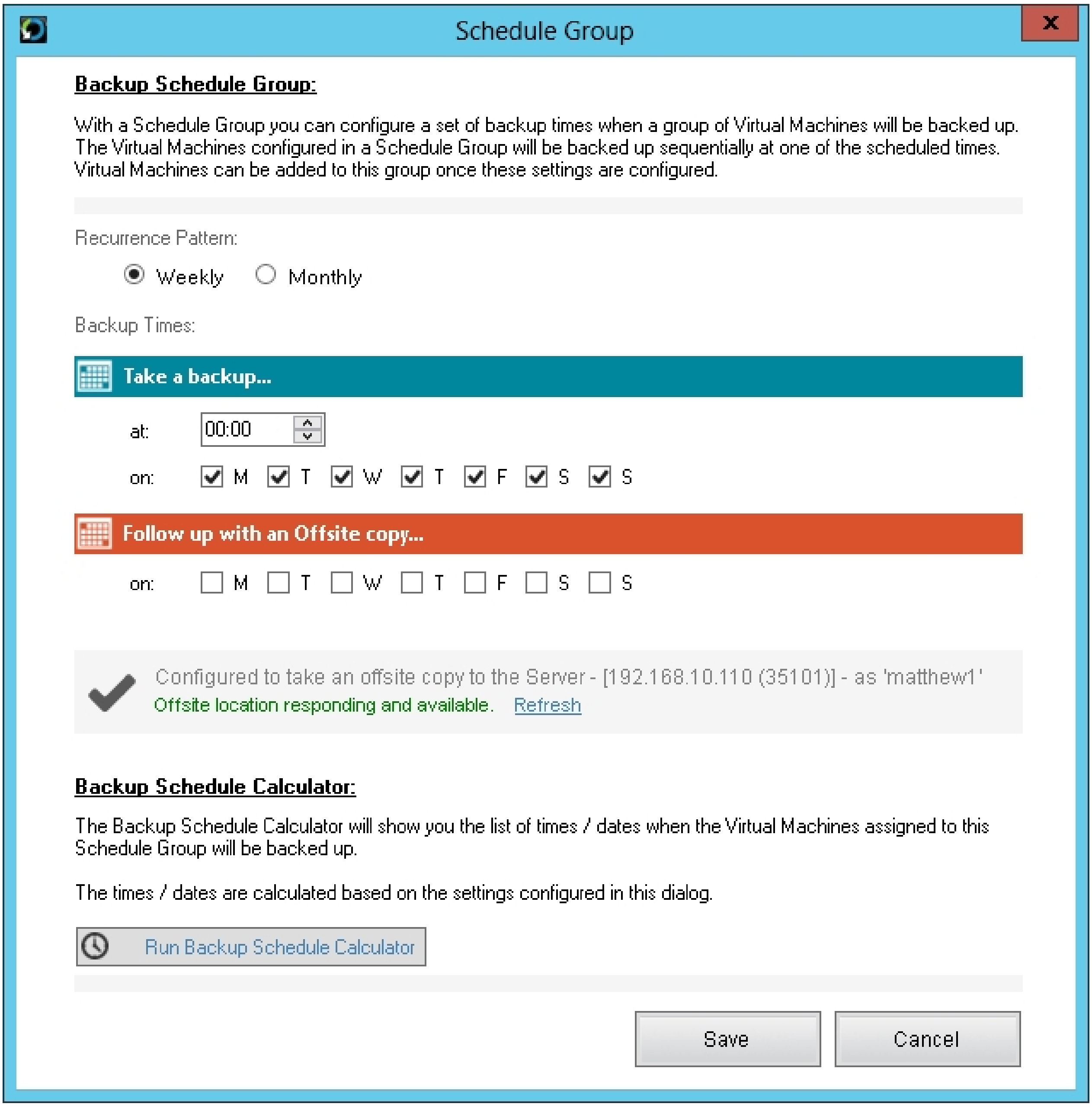
You will be presented by a Window which will prompt you for the schedule group settings.

Recurrence Pattern: whether you would like to configure a weekly or monthly recurrence.

Backup Times: settings to specify the backup times / days. This is split into two sections as shown below:

- **Take a backup** - take a backup of the VMs in this schedule group to the predefined Backup location. To choose your backup location follow the instructions here.
- **Follow up with an Offsite copy** - take a copy of the latest backups of the VMs in this

schedule group to the predefined Offsite Copy location. To choose your Offsite Copy location follow the instructions here.



Backup Schedule Group:

With a Schedule Group you can configure a set of backup times when a group of Virtual Machines will be backed up. The Virtual Machines configured in a Schedule Group will be backed up sequentially at one of the scheduled times. Virtual Machines can be added to this group once these settings are configured.

Recurrence Pattern:

● Weekly ○ Monthly

Backup Times:

Take a backup...

at: 00:00

on: ☑ M ☑ T ☑ W ☑ T ☑ F ☑ S ☑ S

Follow up with an Offsite copy...

on: □ M □ T □ W □ T □ F □ S □ S

✓ Configured to take an offsite copy to the Server - [192.168.10.110 (35101)] - as 'matthew1'
Offsite location responding and available. Refresh

Backup Schedule Calculator:

The Backup Schedule Calculator will show you the list of times / dates when the Virtual Machines assigned to this Schedule Group will be backed up.

The times / dates are calculated based on the settings configured in this dialog.

Weekly Recurrence

1. Select the weekly radio button.

2. Click "Add Backup Time" to add a new backup time entry to the list.

3. Configure multiple backup times. eg. 10am on Mon, Tue and Friday.

4. These backup times will be repeated on a weekly basis.

Monthly Recurrence

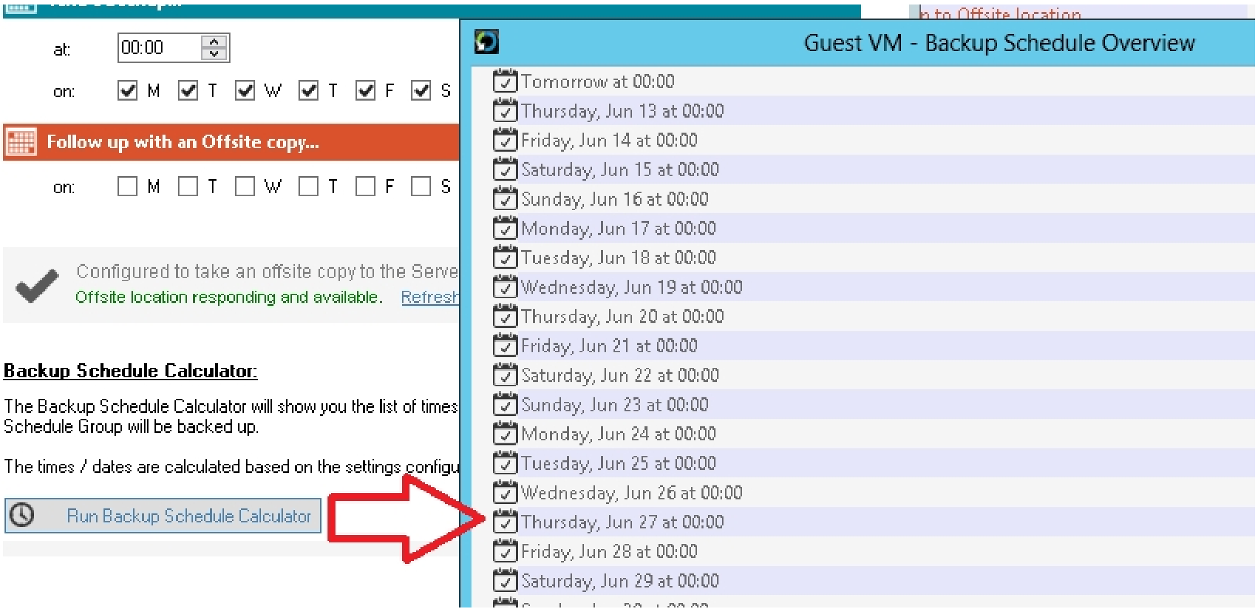
1. Select the monthly radio button.

2. Choose whether you wish the backup to take place on the:

- Xth day of every month. eg: 10th day of every month.
- The Xth day of week of every month. eg: 2nd Wed of every month.

Run the Backup Schedule Calculator before saving changes

You can verify the above settings by simulating the next 25 backup times. To do this click on [Run Backup Schedule Calculator] and you will see a list of the next 25 backup times.



at: 00:00

on: ☑ M ☑ T ☑ W ☑ T ☑ F ☑ S

Follow up with an Offsite copy...

on: □ M □ T □ W □ T □ F □ S

Configured to take an offsite copy to the Serve

Offsite location responding and available. Refresh

Backup Schedule Calculator:

The Backup Schedule Calculator will show you the list of times
Schedule Group will be backed up.

The times / dates are calculated based on the settings configu

Run Backup Schedule Calculator

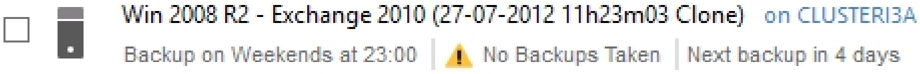
Guest VM - Backup Schedule Overview

- Tomorrow at 00:00
- Thursday, Jun 13 at 00:00
- Friday, Jun 14 at 00:00
- Saturday, Jun 15 at 00:00
- Sunday, Jun 16 at 00:00
- Monday, Jun 17 at 00:00
- Tuesday, Jun 18 at 00:00
- Wednesday, Jun 19 at 00:00
- Thursday, Jun 20 at 00:00
- Friday, Jun 21 at 00:00
- Saturday, Jun 22 at 00:00
- Sunday, Jun 23 at 00:00
- Monday, Jun 24 at 00:00
- Tuesday, Jun 25 at 00:00
- Wednesday, Jun 26 at 00:00
- Thursday, Jun 27 at 00:00
- Friday, Jun 28 at 00:00
- Saturday, Jun 29 at 00:00

Conclusion

Once the Backup Schedule has been set you will notice that the schedule label in the **Backup / Restore** screen has changed.

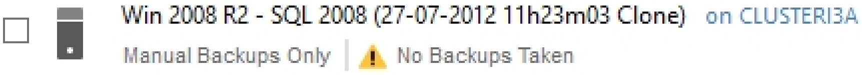
In the case of a VM with no backup schedule set you will see:



□ Win 2008 R2 - Exchange 2010 (27-07-2012 11h23m03 Clone) on CLUSTERI3A

Backup on Weekends at 23:00 | ⚠ No Backups Taken | Next backup in 4 days

In the case of a VM where a backup schedule has been configured you will see:



□ Win 2008 R2 - SQL 2008 (27-07-2012 11h23m03 Clone) on CLUSTERI3A

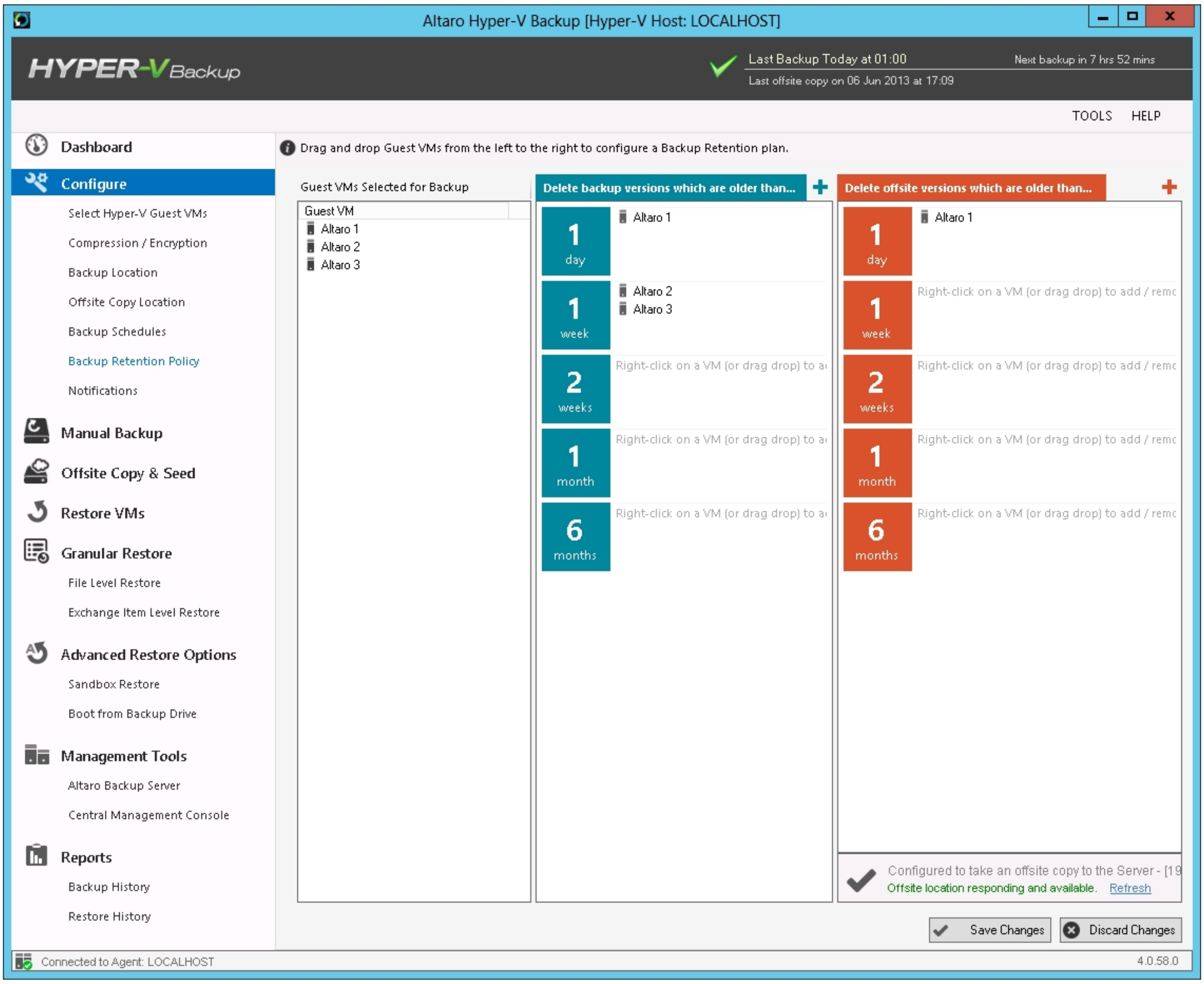
Manual Backups Only | ⚠ No Backups Taken

Configuring a Retention Policy

To manage the amount of disk space used uo on your backup drives and prevent it getting filled up it is important to configure a retention policy for each of your VMs backups.

To do this simply open the **Management Console** and select the option **Backup Retention Policy** from the left hand side main menu.

You will then be presented with a screen as follows:



Altaro Hyper-V Backup [Hyper-V Host: LOCALHOST]

Last Backup Today at 01:00
Next backup in 7 hrs 52 mins
Last offsite copy on 06 Jun 2013 at 17:09

Drag and drop Guest VMs from the left to the right to configure a Backup Retention plan.

Configured to take an offsite copy to the Server - [19
Offsite location responding and available. Refresh

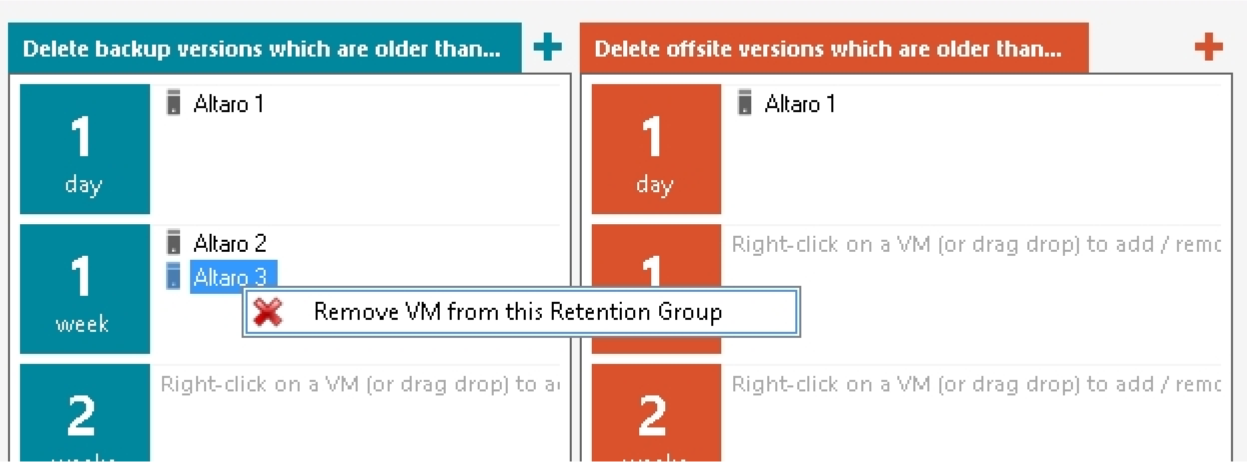
Connected to Agent: LOCALHOST

The retention policies for primary backups are shown in green, and those for your offsite copy are shown in orange.

To add a VM to a Retention Group simply drag and drop it from the left hand side into the desired group for both the primary and off-site retention groups.

If you would like to create a custom Retention Policy, you can do so by clicking the 'plus' (**+**) sign at the top of the appropriate section.

To remove a VM from a particular retention group, simply right-click the VM and choose **'Remove VM from this Retention Group'** as shown below:

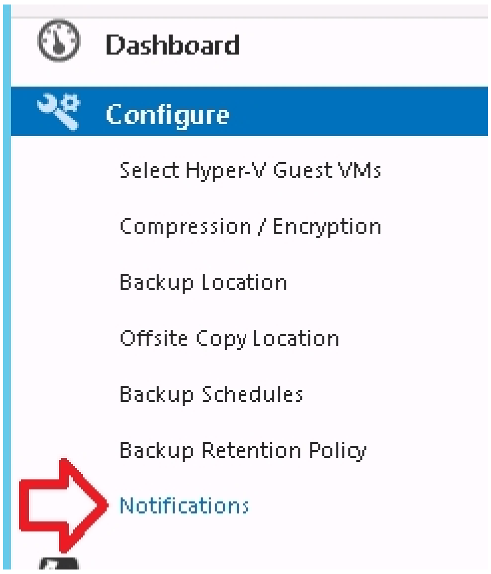

Delete backup versions which are older than...
Delete offsite versions which are older than...
1 day
Altaro 1
1 week
Altaro 2
Altaro 3
Remove VM from this Retention Group
2 weeks
Right-click on a VM (or drag drop) to a
1 day
Altaro 1
1
Right-click on a VM (or drag drop) to add / remo
2
Right-click on a VM (or drag drop) to add / remo

Once you have configured a retention plan for all your VMs, click **Save Changes** to complete.

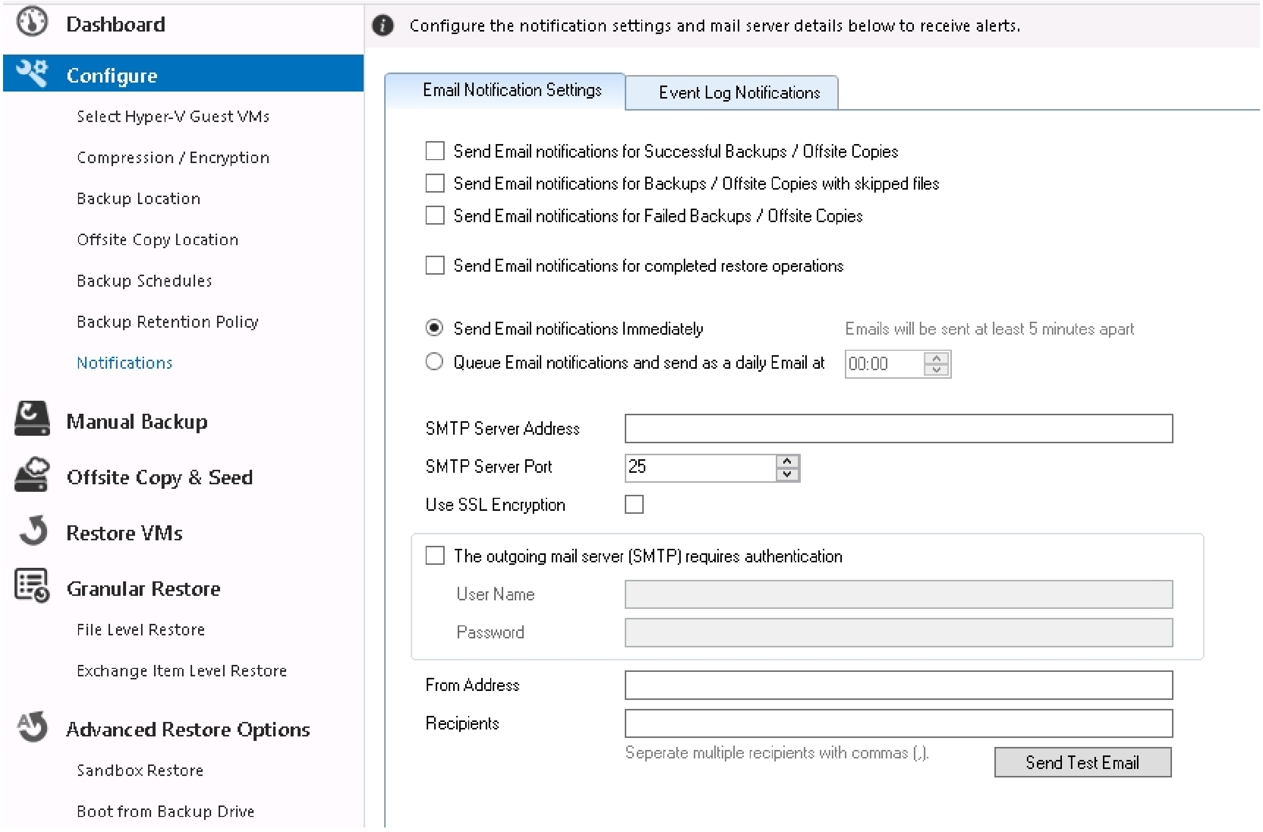
Enabling Notifications

To select which notifications to receive simply open the **Management Console** and select the option "**Notifications**" from the left hand side main menu.

Read instructions on how to open the Management Console here.



1. Once you select "Notifications" you will be presented with the following panel:



Configure the notification settings and mail server details below to receive alerts.

☐ Send Email notifications for Successful Backups / Offsite Copies
☐ Send Email notifications for Backups / Offsite Copies with skipped files
☐ Send Email notifications for Failed Backups / Offsite Copies

☐ Send Email notifications for completed restore operations

● Send Email notifications Immediately — Emails will be sent at least 5 minutes apart
○ Queue Email notifications and send as a daily Email at 00:00

SMTP Server Address:
SMTP Server Port: 25
Use SSL Encryption ☐

☐ The outgoing mail server (SMTP) requires authentication
User Name:
Password:

From Address:
Recipients:
Seperate multiple recipients with commas (,).

2. Simply use the checkboxes to select which notifications you would like to receive.

   - To learn how to configure Email notifications click here.
   - To learn how to configure Event Log notifications click here.

3. Once the selections have been made simply click on '**Save Changes**' to update your backup plan.

Email Notifications

Email Notifications allow users to receive Backup / Restore Reports by email. These reports indicate:

Backup Reports

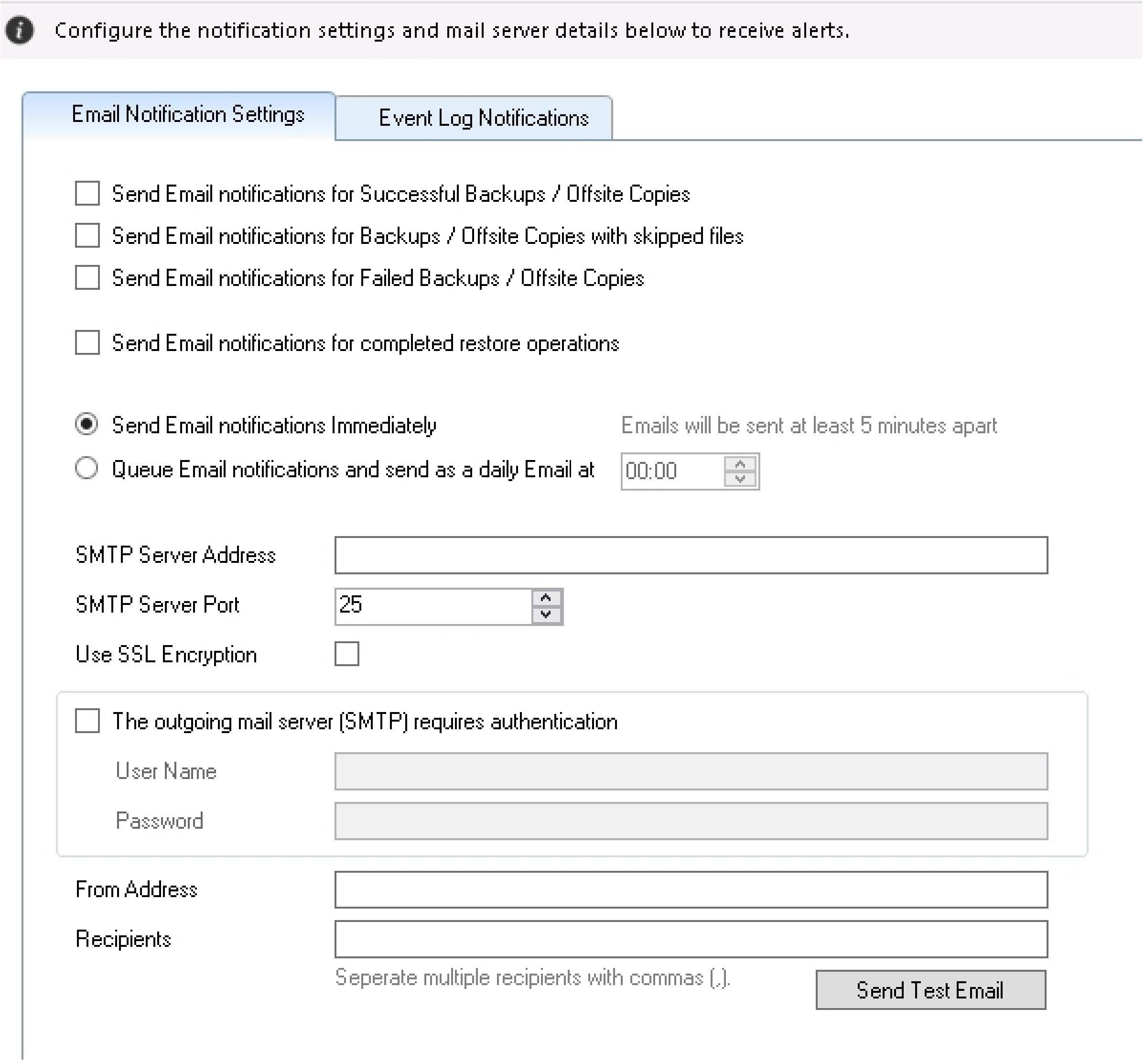
- The status of each backup and the Hyper-V Guest VM that was backed up.
- The date and time of each backup.
- The amount of data backed up.
- The number of changed files.
- The number of skipped files.
- The duration of the backup.

Restore Reports

- The status of each restore operation and the Hyper-V Guest VM that was restored.
- The date and time of each restore operation.
- The duration of the restore operation.

Configuring Email Notifications in order to receive Backup Reports:

- Navigate to the **Setup Notifications** screen as shown here.
- Once within the **Setup Notifications** screen simply select the [Email Notification Settings] tab.



Configure the notification settings and mail server details below to receive alerts.

□ Send Email notifications for Successful Backups / Offsite Copies
□ Send Email notifications for Backups / Offsite Copies with skipped files
□ Send Email notifications for Failed Backups / Offsite Copies

□ Send Email notifications for completed restore operations

● Send Email notifications Immediately — Emails will be sent at least 5 minutes apart
○ Queue Email notifications and send as a daily Email at 00:00

SMTP Server Address:
SMTP Server Port: 25
Use SSL Encryption: □

□ The outgoing mail server (SMTP) requires authentication
User Name:
Password:

From Address:
Recipients:
Seperate multiple recipients with commas (,).

- Use the checkboxes to specify which notifications you would like to receive by email:

  - You can choose to receive notifications for: successful backups, backups in which one or more file was skipped, failed backups and completed restore operations.

  - If you choose to receive notifications for failed backups you will also be alerted when a backup is skipped because your backup drive is not connected.

- Next specify the frequency of your Email notifications. There are two options:

  - Immediately after the operation has completed. (Emails will be sent a minimum of 5 minutes apart and multiple notifications may be grouped into one email).

  - As a daily email digest at a specified time each day.

- Finally configure your SMTP mail server settings and the email recipients. The [Send Test Email] button can be used to test the SMTP settings.

- Once you've finished configuring the Email notifications click on the [Save Changes] button at the bottom of the screen.

Event Log Notifications

Event Log Notifications can be viewed within the Event Viewer console on Windows Server. These are ideal for monitoring the backup and restore operations remotely from another server.

These log entries indicate the following information:

Backup Reports

- The status of each backup and the Hyper-V Guest VM that was backed up.
- The date and time of each backup.
- The amount of data backed up.
- The number of changed files.
- The number of skipped files.
- The duration of the backup.

Restore Reports

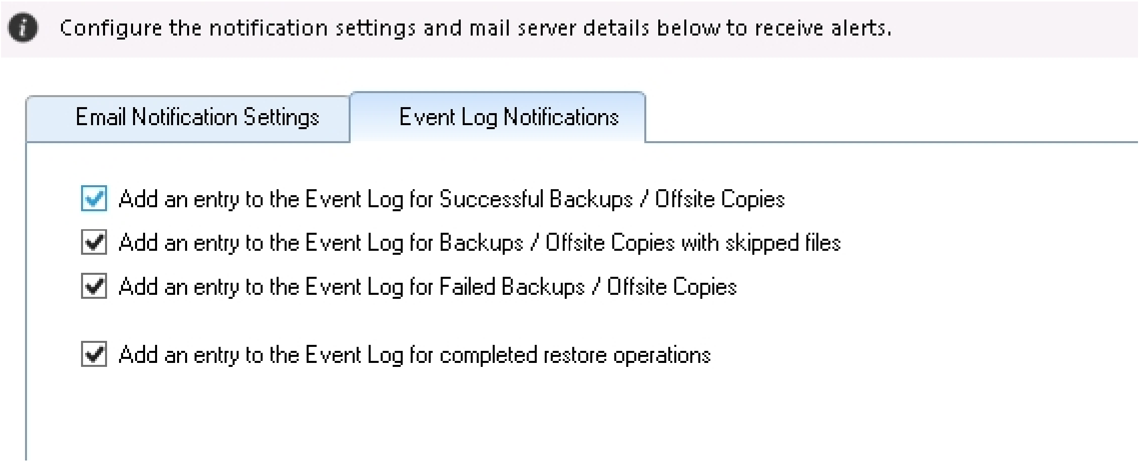
- The status of each restore operation and the Hyper-V Guest VM that was restored.
- The date and time of each restore operation.

- The duration of the restore operation.

Configuring Event Log Notifications in order to receive Backup Reports:

- Navigate to the **Setup Notifications** screen as shown here.

- Once within the **Setup Notifications** screen simply select the [Event Log Notifications] tab.



Configure the notification settings and mail server details below to receive alerts.

☑ Add an entry to the Event Log for Successful Backups / Offsite Copies
☑ Add an entry to the Event Log for Backups / Offsite Copies with skipped files
☑ Add an entry to the Event Log for Failed Backups / Offsite Copies
☑ Add an entry to the Event Log for completed restore operations

- Use the checkboxes to specify which notifications you would like to log:

  - You can choose to receive notifications for: successful backups, backups in which one or more file was skipped, failed backups and completed restore operations.

  - If you choose to receive notifications for failed backups you will also be alerted when a backup is skipped because your backup drive is not connected.

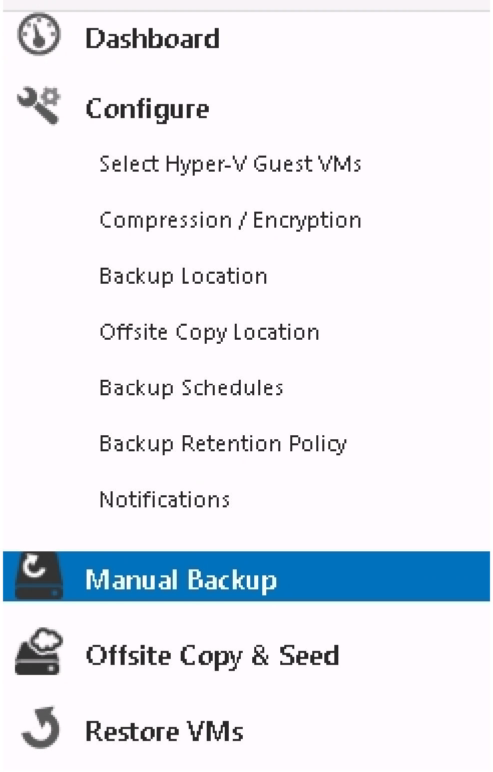
- Once you've finished configuring the Event Log notifications click on the [Save Changes] button at the bottom of the screen.

Advanced VM Backup Settings

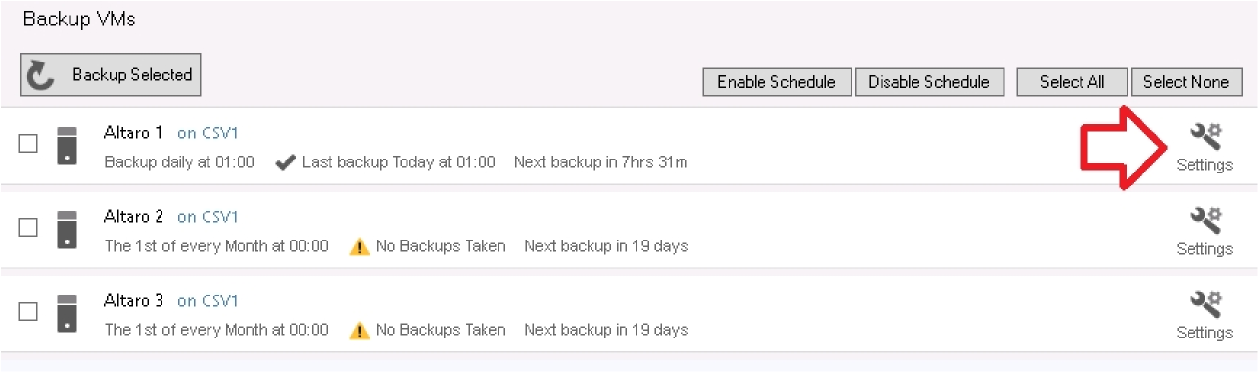
Each VM in your backup plan has a few advanced settings available. These can be accessed by following these steps:

1. Open the **Management Console** as described here.

2. Navigate to the "**Manual Backup**" screen.



3. You will be presented with the following screen. Please note the "Spanner and Wrench" icons to the right hand side of each VM.



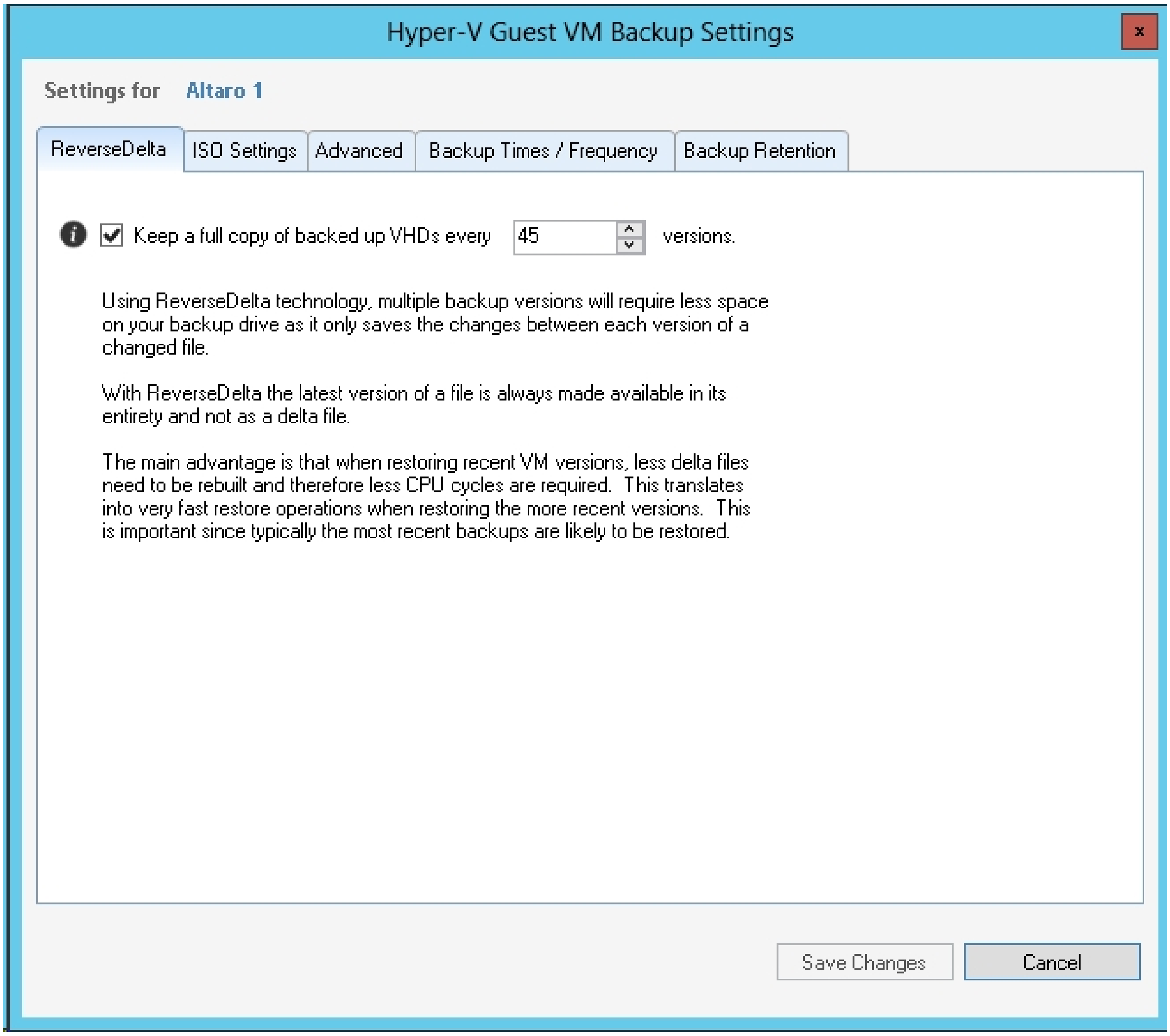
Backup VMs

□ Altaro 1 on CSV1
Backup daily at 01:00 ✓ Last backup Today at 01:00 Next backup in 7hrs 31m

□ Altaro 2 on CSV1
The 1st of every Month at 00:00 ⚠ No Backups Taken Next backup in 19 days

□ Altaro 3 on CSV1
The 1st of every Month at 00:00 ⚠ No Backups Taken Next backup in 19 days

4. Clicking on a "Spanner and Wrench" icon will display the "Advanced Settings" window for the VM in question.



☑ Keep a full copy of backed up VHDs every 45 versions.

Using ReverseDelta technology, multiple backup versions will require less space on your backup drive as it only saves the changes between each version of a changed file.

With ReverseDelta the latest version of a file is always made available in its entirety and not as a delta file.

The main advantage is that when restoring recent VM versions, less delta files need to be rebuilt and therefore less CPU cycles are required. This translates into very fast restore operations when restoring the more recent versions. This is important since typically the most recent backups are likely to be restored.

5. From the advanced settings Window you can do the following:

- Choose how often to take a full copy backup version of the VM. This can be accessed from the **ReverseDelta** tab

- Choose whether to backup ISO files which are attached to the VM. Click here fore more details.

- Choose whether to enable Live Backups for Non-VSS Aware Guests (Crash-Consistent Backups). Click here fore more details.

Backup for Cluster Environments

The Master Controller Node vs. Background Agents

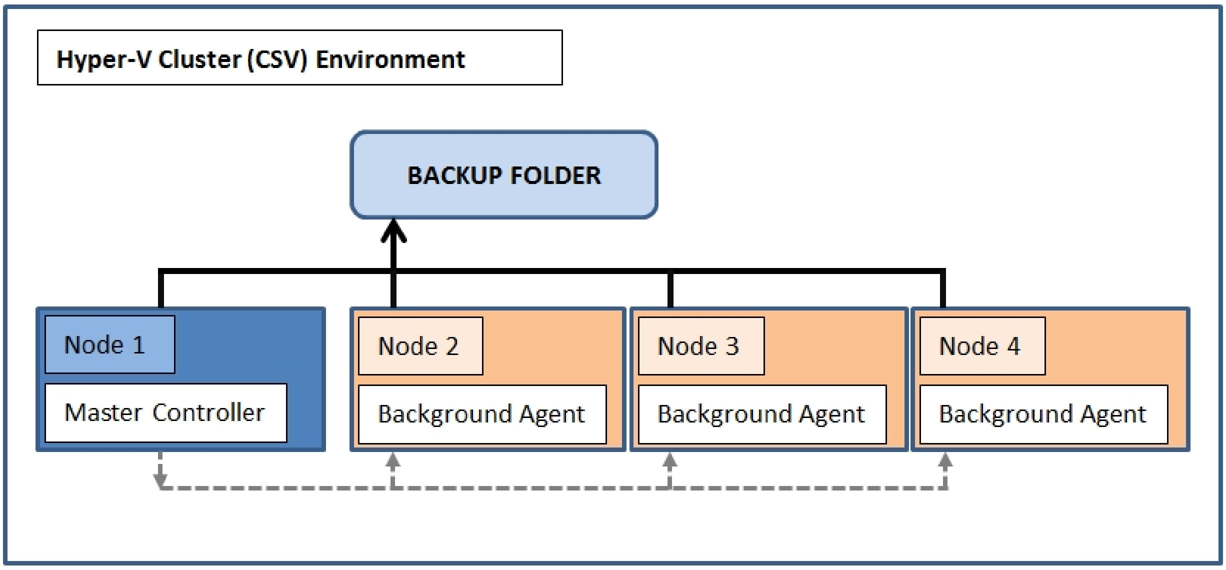
Configuring for a Hyper-V Cluster Environment

Dashboard Cluster Status Tab

Selecting VMs for backup (Cluster Environment)

Selecting a backup drive (Cluster Environment)

The Master Controller Node vs. Background Agents



The Master Controller Node

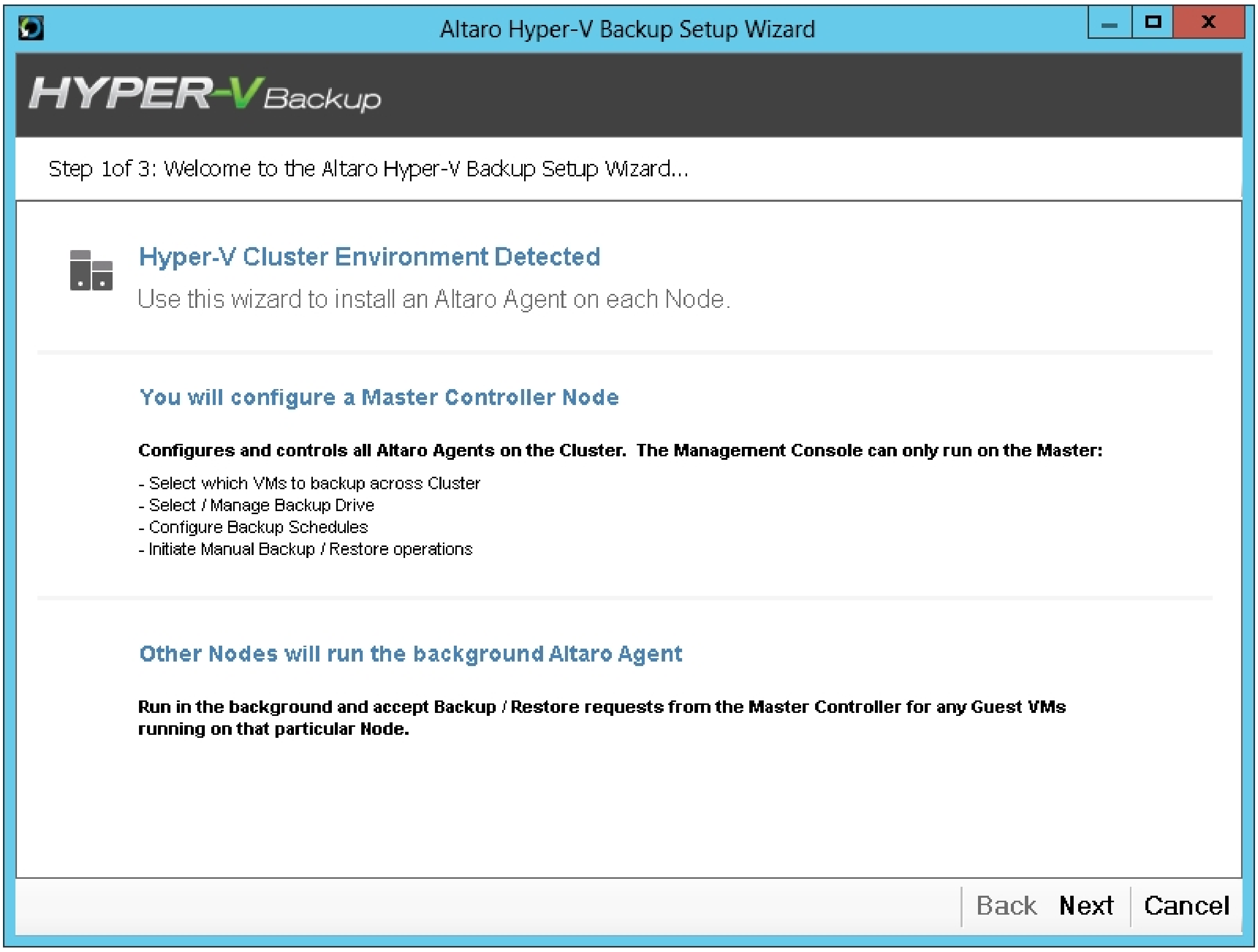
- The Master Controller node configures and controls all the Altaro Background Agents on the cluster.
- The Management Console User Interface must be run on the Master Controller.
- Select which VMs to backup across the Cluster
- Select / Manage Backup Drive
- Configure Backup Schedules
- Initiate Manual Backup / Restore Operations

Altaro Background Agent Nodes

- Run in the background and accept backup and restore requests from the Master Controller node for any Guest VMs running on that particular Node.

Configuring for a Hyper-V Cluster Environment

When installing for the first time within a Hyper-V Cluster Environment a Setup Wizard will be displayed.



Step 1of 3: Welcome to the Altaro Hyper-V Backup Setup Wizard...

Hyper-V Cluster Environment Detected

Use this wizard to install an Altaro Agent on each Node.

You will configure a Master Controller Node

Configures and controls all Altaro Agents on the Cluster. The Management Console can only run on the Master:

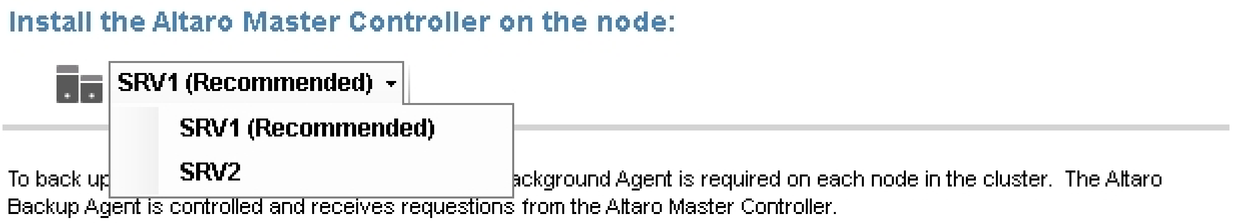
- Select which VMs to backup across Cluster
- Select / Manage Backup Drive
- Configure Backup Schedules
- Initiate Manual Backup / Restore operations

Other Nodes will run the background Altaro Agent

Run in the background and accept Backup / Restore requests from the Master Controller for any Guest VMs running on that particular Node.

1. Click Next then choose which node will be the Master Controller Node and which nodes will be installed as Background Agents. It is recommended that the node upon which you are running the setup wizard is configured as the Master Controller Node.

Any node which has not yet been configured can be chosen as a Master Controller Node.



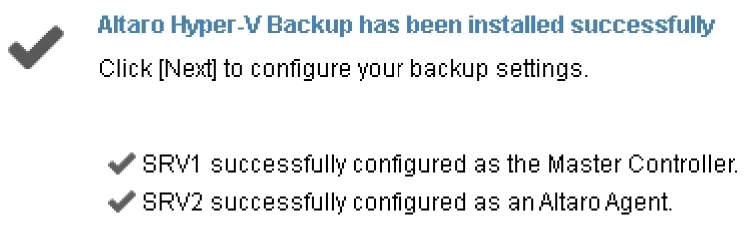
Install the Altaro Master Controller on the node:

SRV1 (Recommended)

To back up ... ackground Agent is required on each node in the cluster. The Altaro Backup Agent is controlled and receives requestions from the Altaro Master Controller.

2. Review the configuration settings and click on "**Install and Configure Agents**".

3. You will now be presented with a progress bar. If you have many nodes then this may take a few minutes. Once the installation is complete you will see a summary of the installation results as shown below. If any of the nodes fail to install press [BACK] and try again. Otherwise press [NEXT].



Altaro Hyper-V Backup has been installed successfully

Click [Next] to configure your backup settings.

✓ SRV1 successfully configured as the Master Controller.

✓ SRV2 successfully configured as an Altaro Agent.

Note: If you chose to configure the current Node as a Background Agent then you must switch to the Master Controller Node to launch the Management Console.

4. The Management Console will now be launched automatically if the current node was configured as the Master Controller. You will be then be taken to the Hyper-V Guest Selection Screen.

Next Steps:

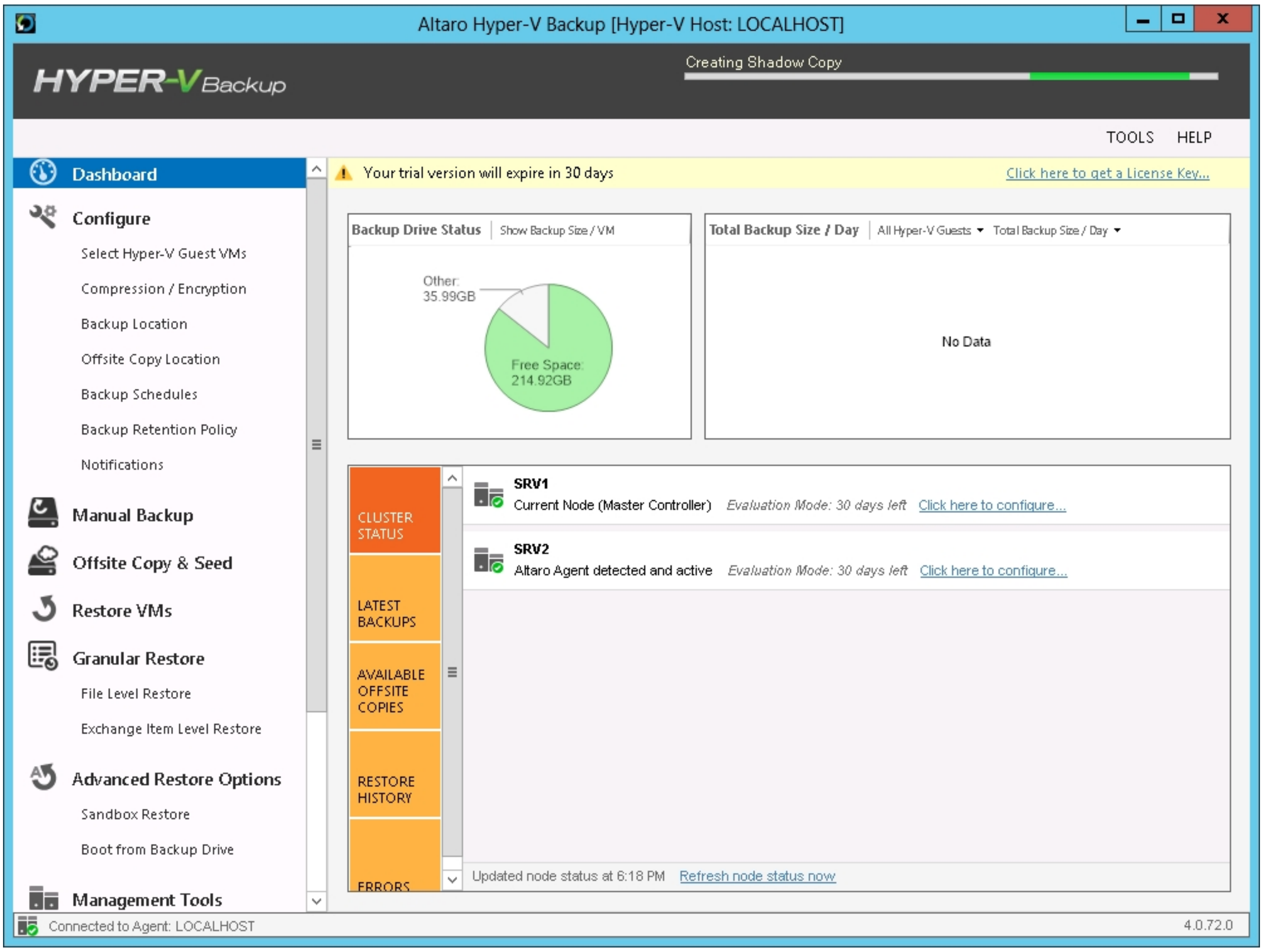
Choosing which Guest VMs to backup within a Hyper-V Cluster Environment

Configuring a Backup Drive in a Hyper-V Cluster Environment

Dashboard Cluster Status Tab

When running Altaro Hyper-V Backup in a Cluster Environment a new tab will appear within the Dasboard Screen.

Cluster Status Tab



Your trial version will expire in 30 days

SRV1 Current Node (Master Controller)	Evaluation Mode: 30 days left	Click here to configure...
SRV2 Altaro Agent detected and active	Evaluation Mode: 30 days left	Click here to configure...

Updated node status at 6:18 PM Refresh node status now

Connected to Agent: LOCALHOST

The Cluster Status Tab will show a list of nodes on the cluster. The cluster status is refreshed every 5 minutes automatically, but a refresh can be forced by clicking on the "Refresh node status node" button. The following information is shown alongside each node:

- The **Name** of the node

- The **Status** of the Altaro Agent on that node:

  - Altaro Agent not detected.
  - Altaro Agent detected but must be upgraded to a newer version.
  - Altaro Agent detected and active.
  - Altaro Agent detected but is running as a Master Controller. This means that it cannot be configured from the current node. Click here to learn more.

- The **Evaluation Details** of the Altaro Agent on that node: (if the agent is currently within Evaluation mode)

  - Number of days left for evaluation.
  - Whether the evaluation period has expired or not.
  - Whether the selected license key includes support for Cluster Environments.

- A "**Configure Button":**

  - Can be used to configure / update / install / uninstall the Altaro Agent upon that node.
  - Can be used to license the Altaro Agent upon that node.

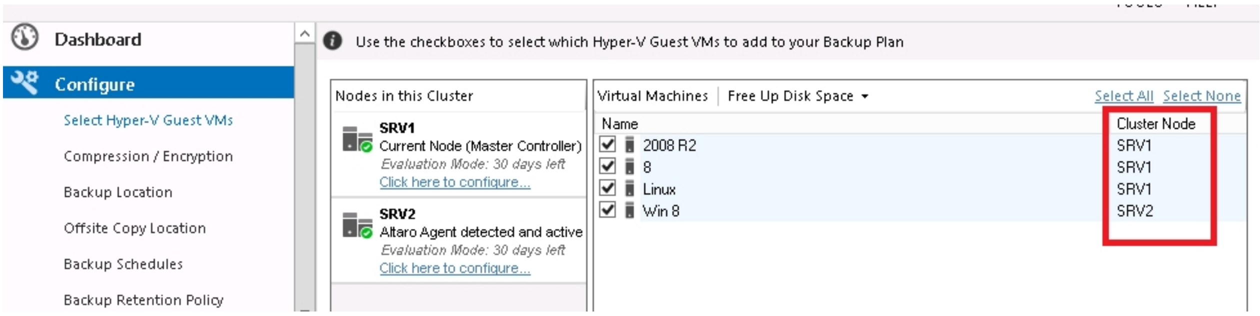
Click here to read more about configuring agents.

Selecting VMs for backup (Cluster Environment)

When selecting which Hyper-V Guests to add to your backup plan within a Hyper-V Cluster Environment an additional panel is displayed. This panel displays a list of nodes on the cluster and indicates the status of the Altaro Background Agent on each node.

The Hyper-V Guest VM list will now show all VMs available on the Cluster (including those that are not on the current node). An additional column will appear to show which node the VM is currently running upon. You can add any VM from any Node on the Cluster to your backup plan.

Before proceeding read the chapter on Choosing which VMs to backup.



Use the checkboxes to select which Hyper-V Guest VMs to add to your Backup Plan

Nodes in this Cluster

SRV1
Current Node (Master Controller)
Evaluation Mode: 30 days left
Click here to configure...

SRV2
Altaro Agent detected and active
Evaluation Mode: 30 days left
Click here to configure...

Name	Cluster Node
☑ 2008 R2	SRV1
☑ 8	SRV1
☑ Linux	SRV1
☑ Win 8	SRV2

If a Background Agent on a specific node is not configured correctly then you will be unable to choose VMs from that node for backup. To configure the node correctly click on the button "Click here to configure correctly...".

Selecting a Backup Drive (Cluster Environment)

To see how to select a backup drive please read this chapter. This article will describe an additional step which is required when selecting a backup drive in a Cluster Environment.

Also please note that special considerations must be taken when selecting a backup drive in a Cluster Environment.

Configuring the Altaro Agent upon a Node

At any point you may choose to confugure an Altaro Agent upon a specific node. Configuration options include:

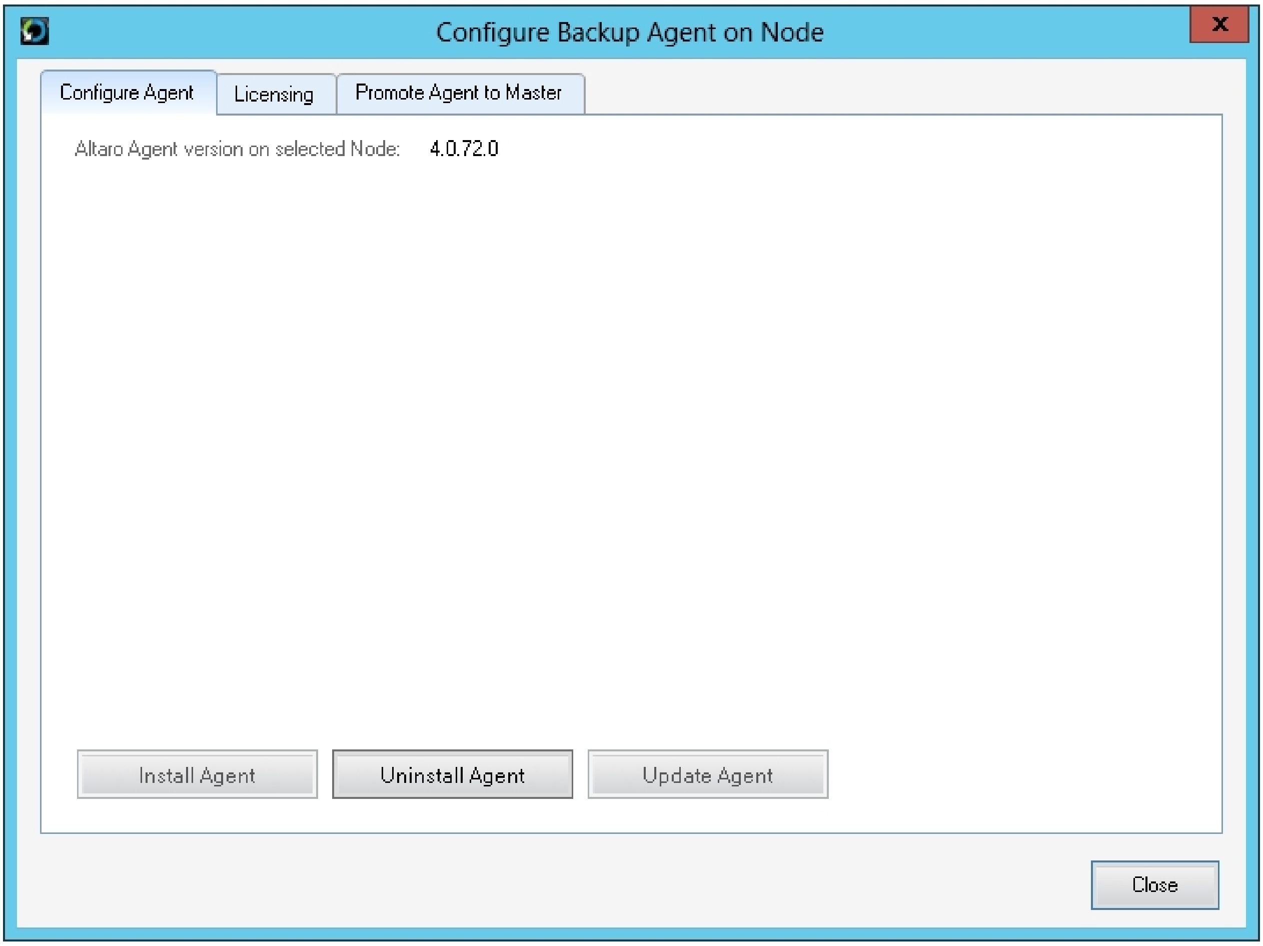
- Update / install / uninstall the Altaro Agent upon that node.
- Switch a node from a Master Controller to background agent.
- License the Altaro Agent upon that node.

To access the conifguration panel simply use the Dashboard Cluster Tab and click on "Click here to configure..." besides the required Node.

Tab 1: Configure Agent

Three buttons are present at the bottom of the tab page:

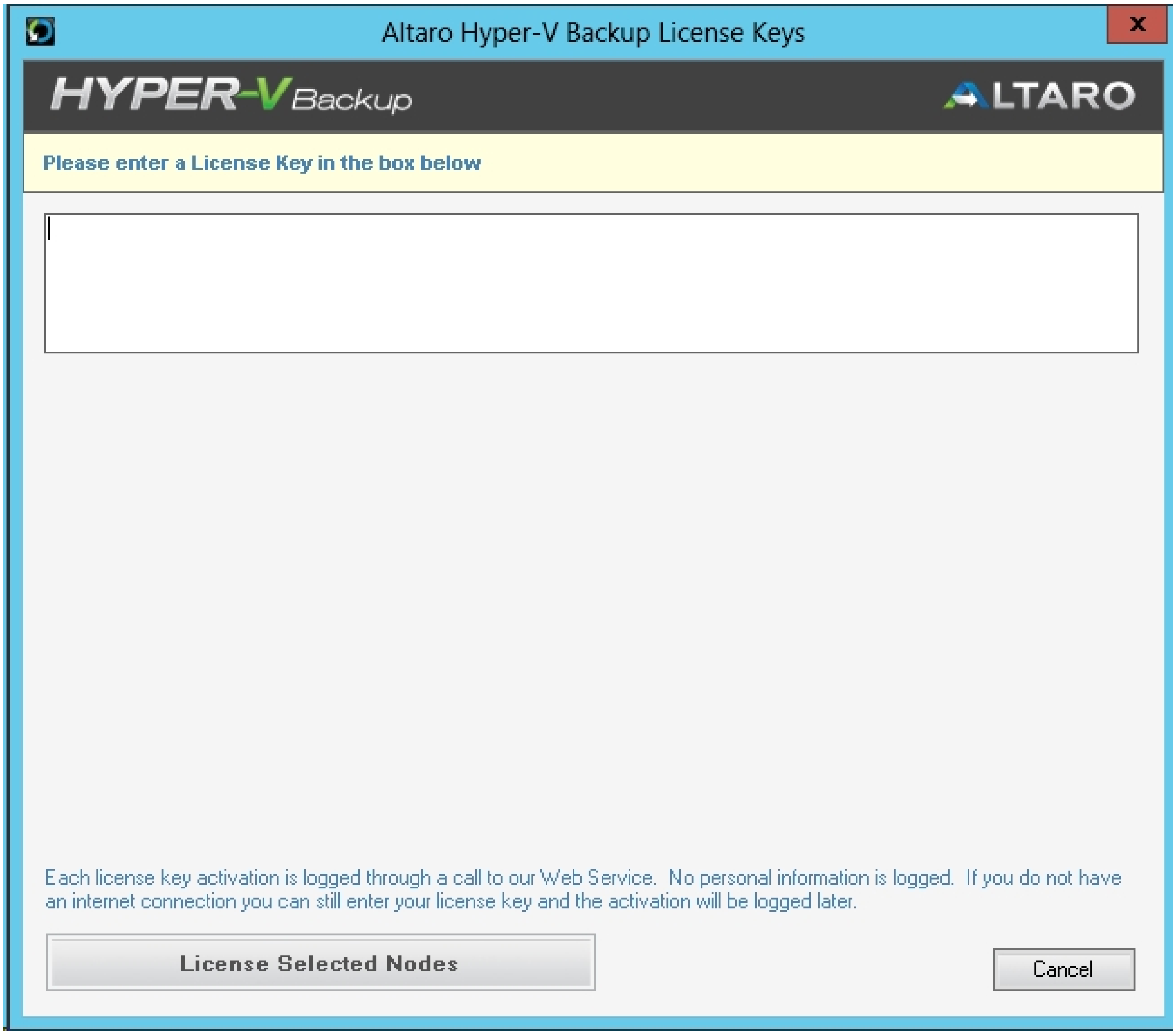
- **Install Agent**: installs the Altaro Agent on the Node and configures it correctly.
- **Configure Agent**: switches a node from a Master Controller to background agent Node.
- **Uninstall Agent:** removes the Altaro Agent from the Node.
- **Update Agent:** Updates the Altaro Agent on the Node to the current Master Controller Version.



Altaro Agent version on selected Node: 4.0.72.0

Tab 2: Licensing

This tab allows you to push a license key to the selected Node. Just click on the [Enter / View License Key] button and the following Window will appear which facilitates the licensing of each Node in the cluster. Simply use the checkboxes in the list to identify which Nodes you would like to license. The number of Nodes allowed is dependent on the number of activations allowed by the License Key.

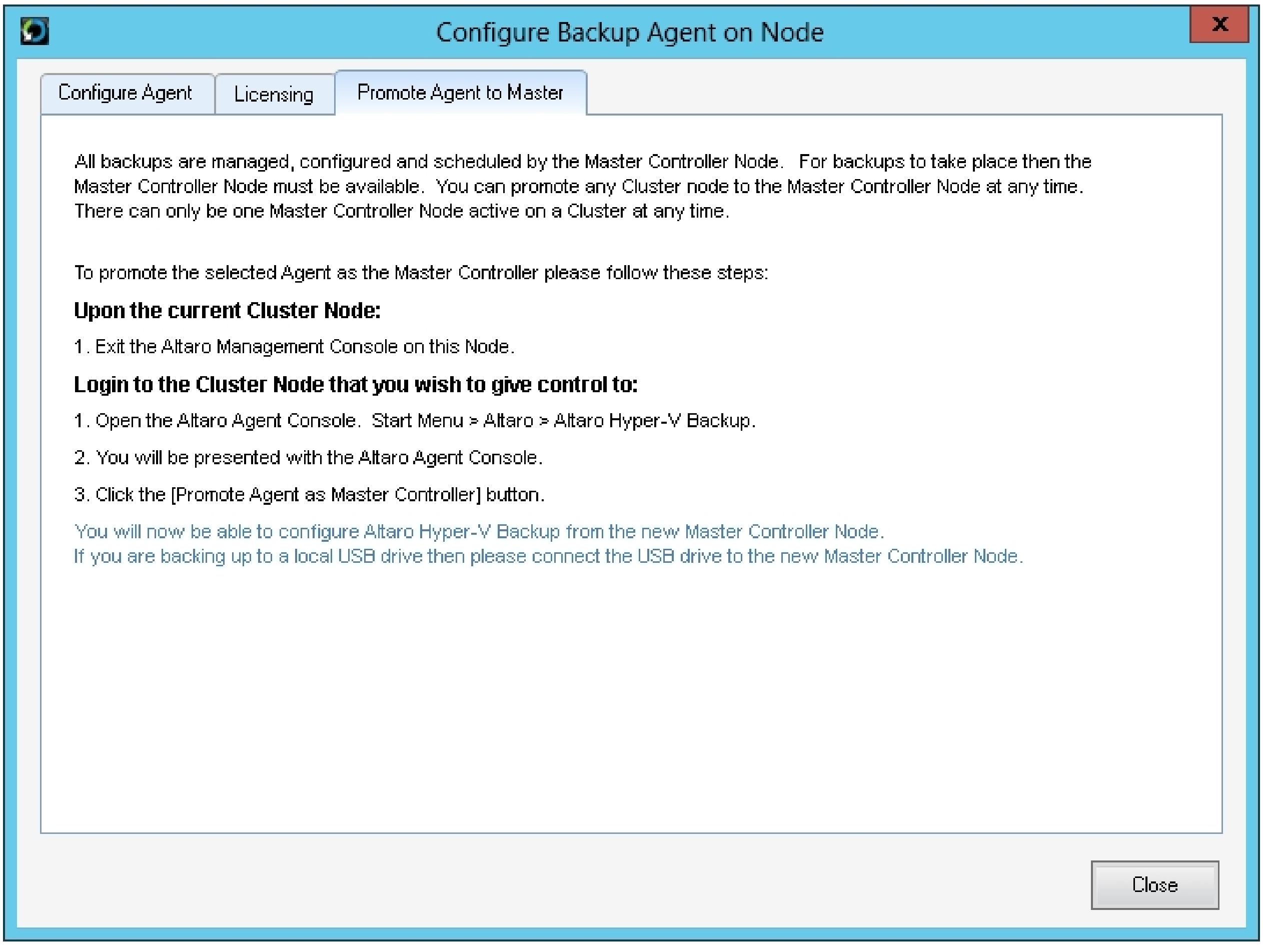


Please enter a License Key in the box below

Each license key activation is logged through a call to our Web Service. No personal information is logged. If you do not have an internet connection you can still enter your license key and the activation will be logged later.

Tab 3: Promote Agent to Master

This tab simply provides instructions on how to promote the selected Agent as a Master Controller. Click here for instructions on how to do this.



All backups are managed, configured and scheduled by the Master Controller Node. For backups to take place then the Master Controller Node must be available. You can promote any Cluster node to the Master Controller Node at any time. There can only be one Master Controller Node active on a Cluster at any time.

To promote the selected Agent as the Master Controller please follow these steps:

Upon the current Cluster Node:

1. Exit the Altaro Management Console on this Node.

Login to the Cluster Node that you wish to give control to:

1. Open the Altaro Agent Console. Start Menu > Altaro > Altaro Hyper-V Backup.
2. You will be presented with the Altaro Agent Console.
3. Click the [Promote Agent as Master Controller] button.

You will now be able to configure Altaro Hyper-V Backup from the new Master Controller Node.
If you are backing up to a local USB drive then please connect the USB drive to the new Master Controller Node.

Other considerations when using Altaro Agents

Altaro Agent User Interface

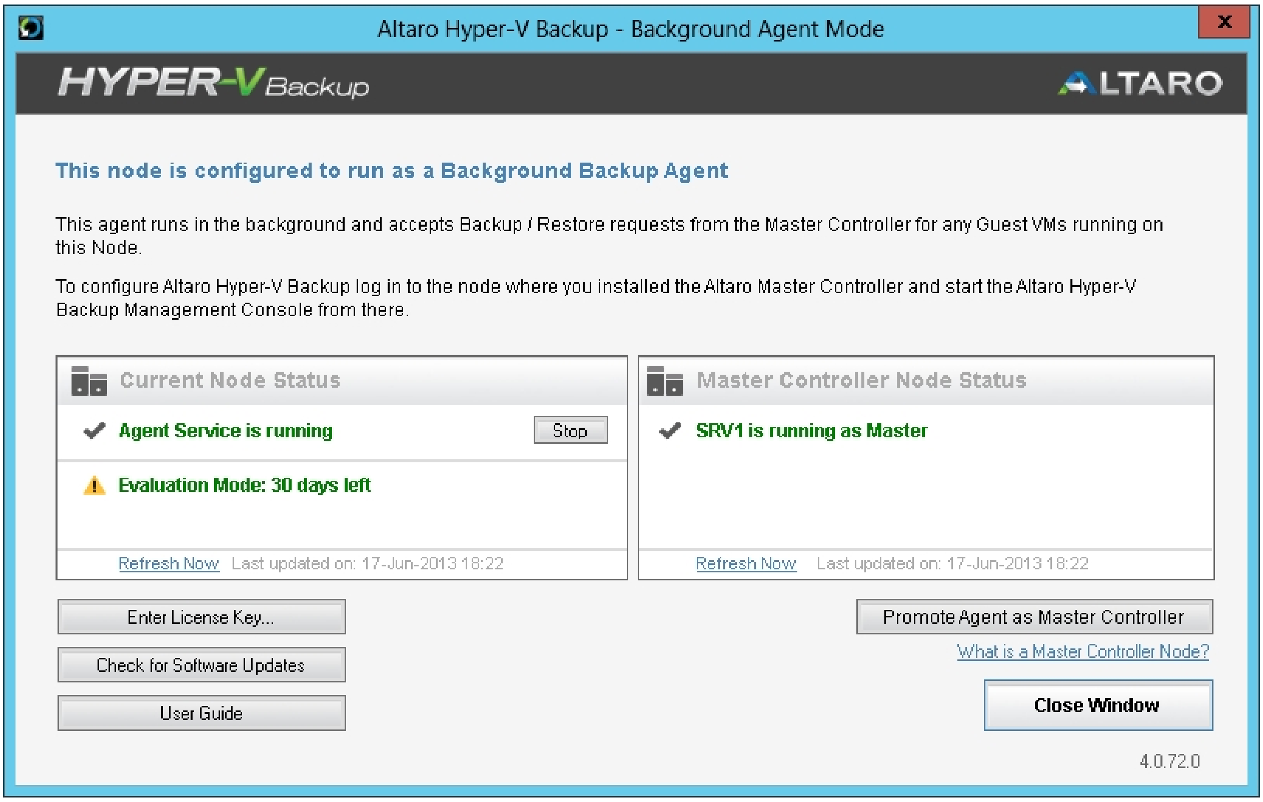
Promoting an Altaro Agent as the Master Controller

Altaro Agent User Interface

As discussed earlier in this section the Management Console can only be accessed from the Master Controller Node. Attempting to launch the Management Console from other nodes will only launch a simple Status Console as shown below.

To launch the Agent Console please use one of the following methods:

- Clicking on the **Altaro Hyper-V Backup** item within the *"Start Menu > All Programs > Altaro"* group.
- Launching "Altaro Hyper-V Backup.exe" application from the install location. By default this is *"C:\Program Files\Altaro\Altaro Hyper-V Backup"*.
- Enter the command **STARTALTARO** into a command prompt window. This may not work immediately after first install until you log out and in to the Server due to the Environment Variables not being refreshed.



This node is configured to run as a Background Backup Agent

This agent runs in the background and accepts Backup / Restore requests from the Master Controller for any Guest VMs running on this Node.

To configure Altaro Hyper-V Backup log in to the node where you installed the Altaro Master Controller and start the Altaro Hyper-V Backup Management Console from there.

Current Node Status
✓ Agent Service is running
Evaluation Mode: 30 days left
Refresh Now Last updated on: 17-Jun-2013 18:22

Master Controller Node Status
✓ SRV1 is running as Master
Refresh Now Last updated on: 17-Jun-2013 18:22

Stop
Enter License Key...
Check for Software Updates
User Guide
Promote Agent as Master Controller
What is a Master Controller Node?
Close Window
4.0.72.0

This console mainly provides status information but allows for the following:

- Entering a License Key.
- Checking for Sofware Updates.
- Accessing the User Guide.
- Stopping / Starting the Agent Windows Service.
- Promoting the Agent as the new Master Controller.

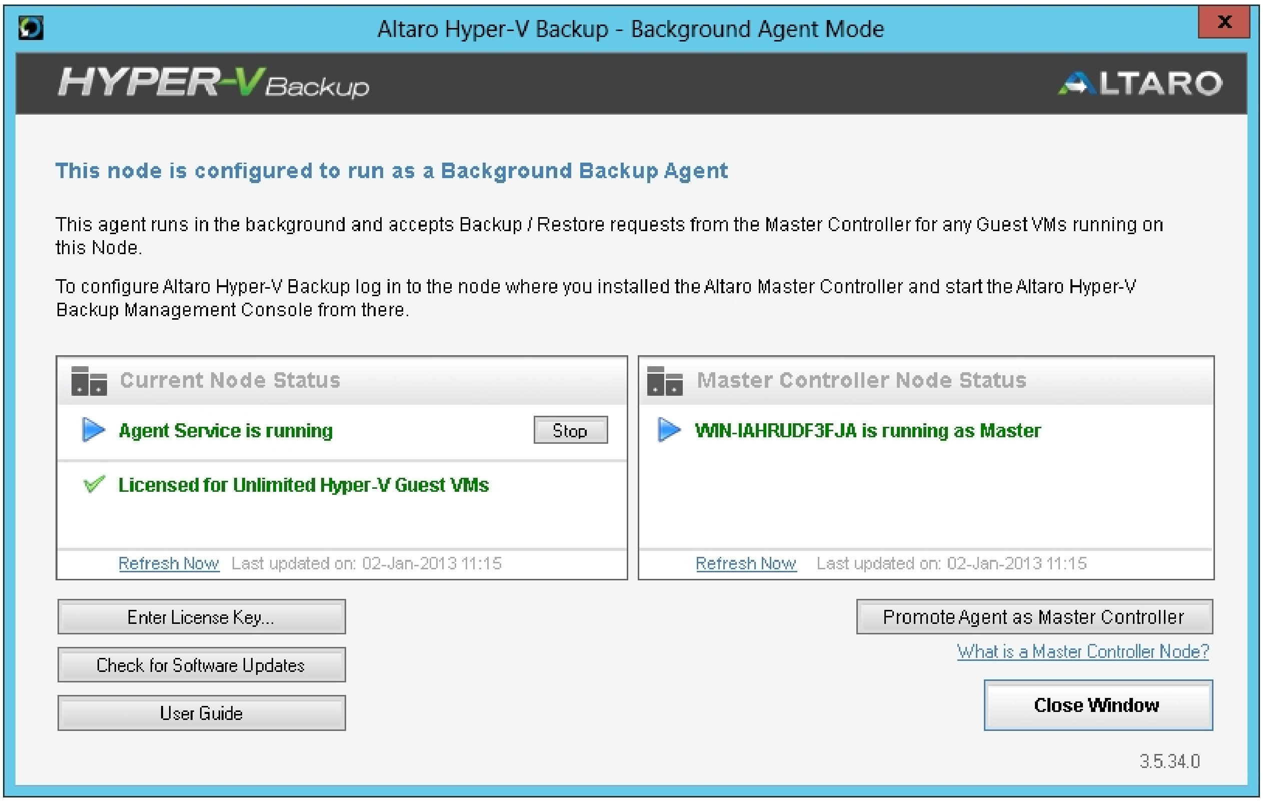
Promoting an Altaro Agent as the Master Controller

Please Note: Before reading this article it is important to understand the difference between a Master Controller Node and a Background Altaro Agent. Click here to read more on this topic.

If you wish to promote a node to the Master Controller you must open the Agent Console using one of the following methods:

- Clicking on the **Altaro Hyper-V Backup** item within the *"Start Menu > All Programs > Altaro"* group.
- Launching "Altaro Hyper-V Backup.exe" application from the install location. By default this is *"C:\Program Files\Altaro\Altaro Hyper-V Backup"*.
- Enter the command **STARTALTARO** into a command prompt window. This may not work immediately after first install until you log out and in to the Server due to the Environment Variables not being refreshed.

Once launched you will see the following screen:



This node is configured to run as a Background Backup Agent

This agent runs in the background and accepts Backup / Restore requests from the Master Controller for any Guest VMs running on this Node.

To configure Altaro Hyper-V Backup log in to the node where you installed the Altaro Master Controller and start the Altaro Hyper-V Backup Management Console from there.

Current Node Status

Agent Service is running

Licensed for Unlimited Hyper-V Guest VMs

Refresh Now Last updated on: 02-Jan-2013 11:15

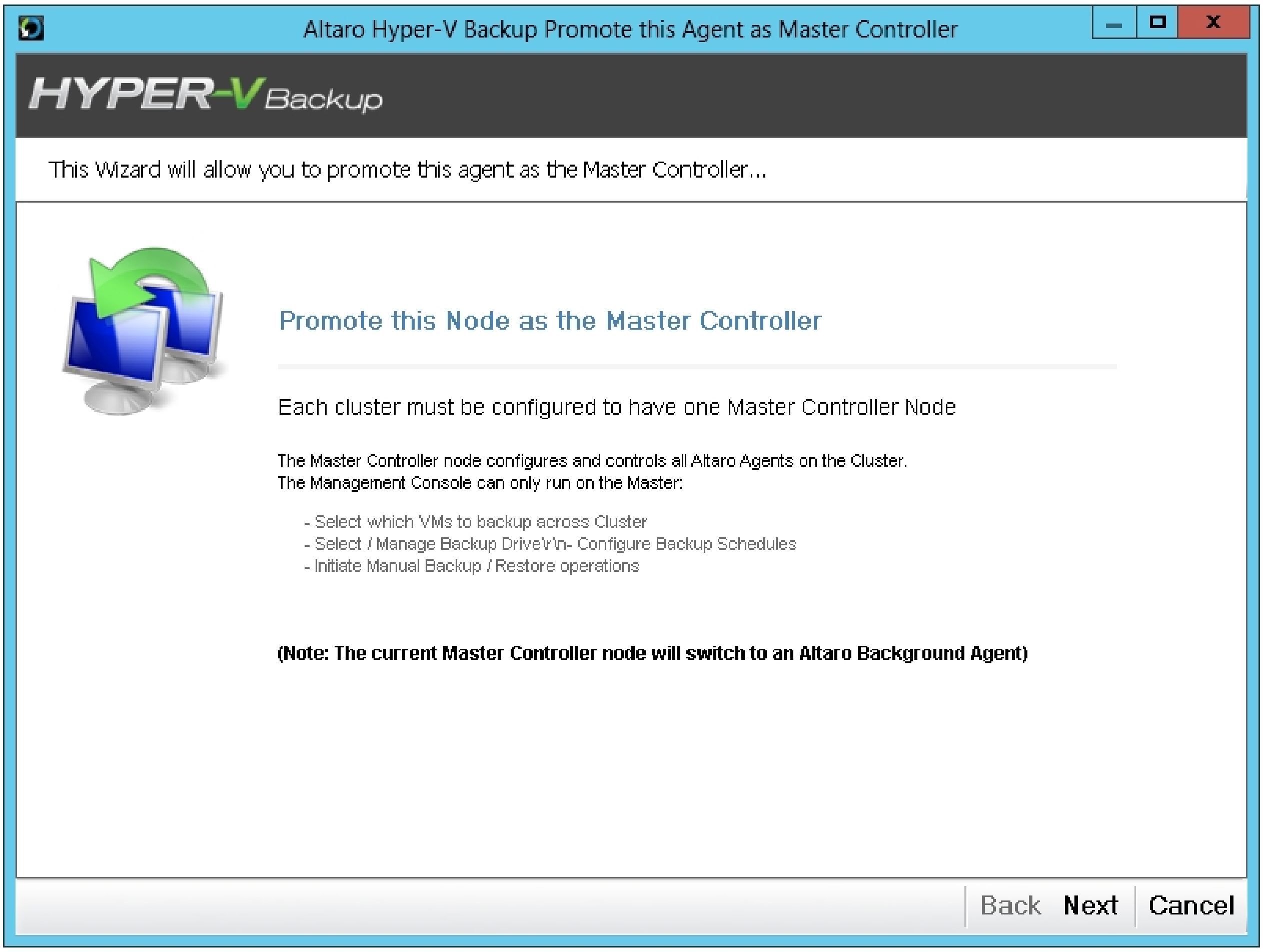
Master Controller Node Status

WIN-IAHRUDF3FJA is running as Master

Refresh Now Last updated on: 02-Jan-2013 11:15

Stop
Enter License Key...
Check for Software Updates
User Guide
Promote Agent as Master Controller
What is a Master Controller Node?
Close Window
3.5.34.0

1. Click on "Promote Agent as Master Controller" to begin. The first screen that will appear is simply an information screen explaining what a Master Controller node does. Promoting an agent will demote the previous Master Controller.



Altaro Hyper-V Backup Promote this Agent as Master Controller
HYPER-V Backup
Back
Next
Cancel

This Wizard will allow you to promote this agent as the Master Controller...

Promote this Node as the Master Controller

Each cluster must be configured to have one Master Controller Node

The Master Controller node configures and controls all Altaro Agents on the Cluster.
The Management Console can only run on the Master:

- Select which VMs to backup across Cluster
- Select / Manage Backup Drive\r\n- Configure Backup Schedules
- Initiate Manual Backup / Restore operations

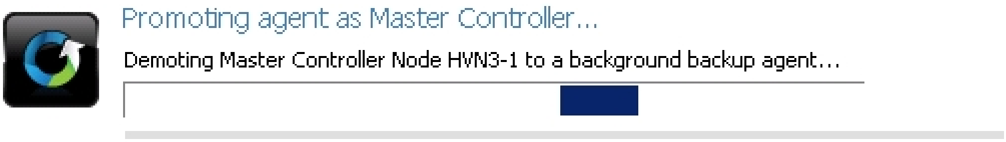
(Note: The current Master Controller node will switch to an Altaro Background Agent)

2. The next step is to select the backup folder currently being backed up to by the old Master Controller.

- Only backup folders of the same Cluster will be displayed.
- You may choose to attach to a UNC Path.
- You may choose to connect the backup drive directly to the new node.
- If you do not find the backup folder, click on "Specify a subfolder..." to choose the parent folder of the **AltaroHyperVBackup** folder which contains the backup files.
- You can check the "Last Backup Time" to ensure that you are attaching to the correct folder.

3. Confirm that you would like to promote the agent as Master Controller. Once again please note that the previous Master Controller will be demoted to a background Altaro Agent. If the old Master Controller node is currently offline / unavailable then it will be demoted the next time it starts or connects to the backup drive.

4. The operation will begin and a progress bar will show the current action. This may take a few minutes.



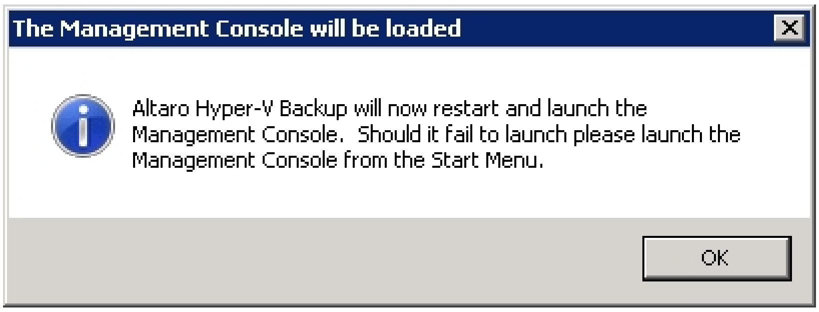
Promoting agent as Master Controller...

Demoting Master Controller Node HVN3-1 to a background backup agent...

5. Once the promotion is completed the progress bar will be replaced by a message. It can either be successful as displayed in the example below or an error could be listed. In the case of an error please refer to the error message, resolve the issue and try again.

An example of an error is that the current Master Controller node is currently busy taking a backup - in that case promotion of other nodes is not allowed.

6. Finally if the promotion was successful the the Managment Console will be launched. It is possible that the Management Console will not start automatically. If not please launch it manually from the Start Menu.



The Management Console will be loaded

Altaro Hyper-V Backup will now restart and launch the Management Console. Should it fail to launch please launch the Management Console from the Start Menu.

Firewall Rules / Communication between Nodes

It is important to note that Altaro Hyper-V Backup performs the following IPC and TCP communication:

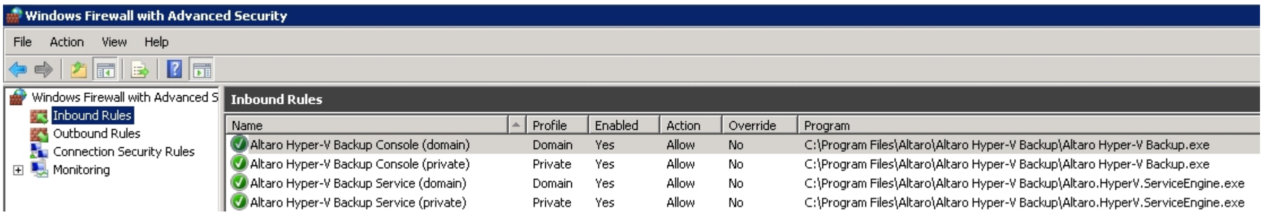
IPC Ports are used for communication within the same Node between the Management Console and the "Altaro Hyper-V Backup" Windows Service.

Below is a list of the default **TCP ports** used by our software and their purpose. All these ports must be allowed.

TCP Ports	Description
35100	Communication with the Remote Management Console
35101 - 35105	Communication with the Altaro Backup Server
24251 - 24252	Communication between agents on the same cluster
24253	Communication from the Remote Management Console to Agent

To facilitate this communication the Altaro Hyper-V Backup Windows Installer create the Windows Firewall rules below which allow communication between the following processes:

- Altaro Hyper-V Backup.exe
- Altaro.HyperV.ServiceEngine.exe



Windows Firewall with Advanced Security

Inbound Rules

Name	Profile	Enabled	Action	Override	Program
Altaro Hyper-V Backup Console (domain)	Domain	Yes	Allow	No	C:\Program Files\Altaro\Altaro Hyper-V Backup\Altaro Hyper-V Backup.exe
Altaro Hyper-V Backup Console (private)	Private	Yes	Allow	No	C:\Program Files\Altaro\Altaro Hyper-V Backup\Altaro Hyper-V Backup.exe
Altaro Hyper-V Backup Service (domain)	Domain	Yes	Allow	No	C:\Program Files\Altaro\Altaro Hyper-V Backup\Altaro.HyperV.ServiceEngine.exe
Altaro Hyper-V Backup Service (private)	Private	Yes	Allow	No	C:\Program Files\Altaro\Altaro Hyper-V Backup\Altaro.HyperV.ServiceEngine.exe

Understanding Altaro Hyper-V Backup

The Altaro Hyper-V Backup program is made up of four main components:

- The Altaro Hyper-V Backup Management Console

  - User interface for users to interact with Altaro Hyper-V Backup.

  - Read more here.

- The Altaro Hyper-V Backup Service

  - a Windows Service that runs in the background and is responsible for backup, restore and backup retention operations.

  - Read more here.

- The Altaro Hyper-V Backup Service Controller Console

  - User interface for users to stop and start the service and to discard and restart their backup plan.

  - Read more here.

- The Altaro Hyper-V Backup Error Reporter

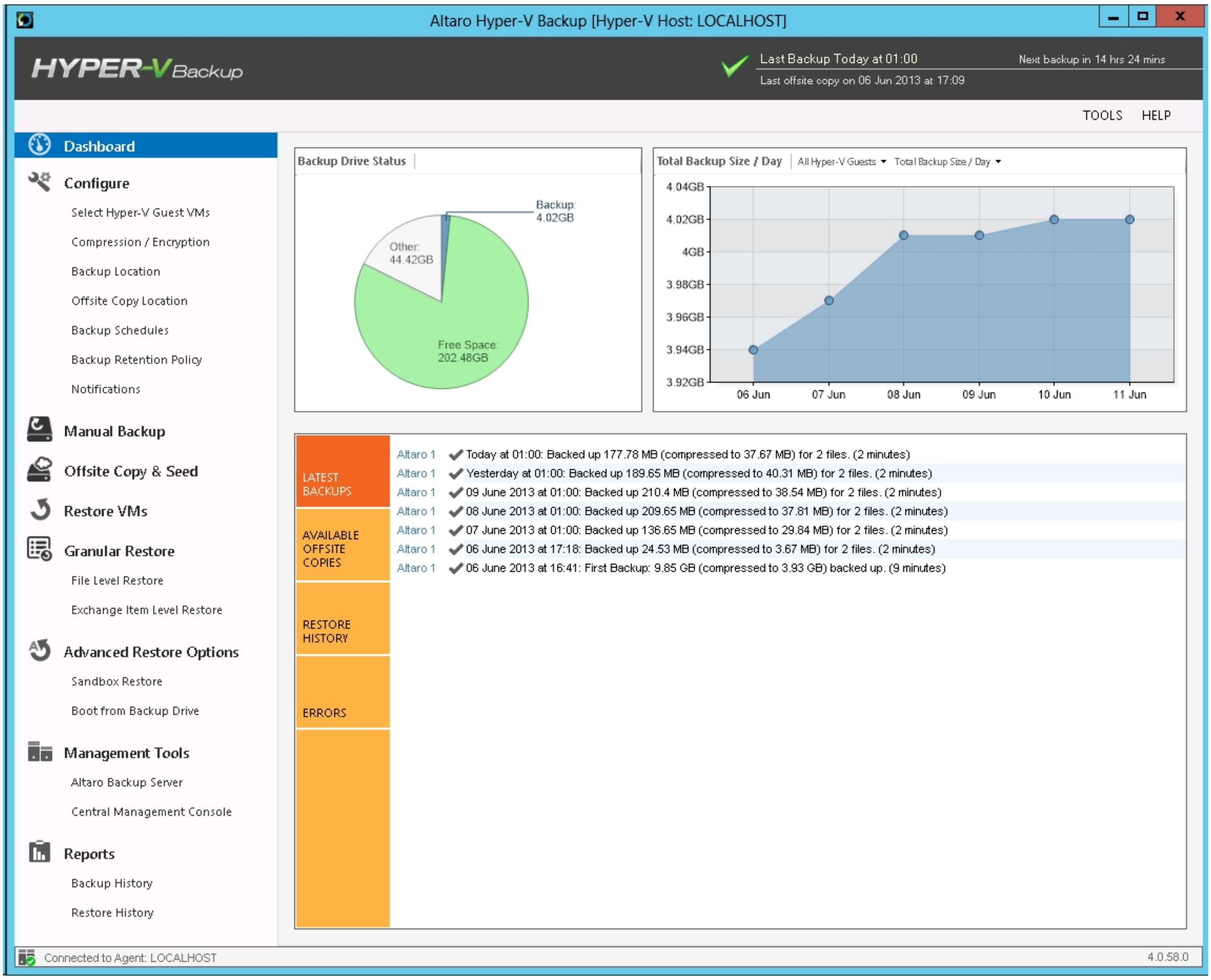
  - User interface for users to build an error report which automatically collects all necessary logs and configuration files. The user can then send the error report by email.

  - Read more here.

In this section a brief overview of each component will be given. The overview will focus on the user interface layout of each one. More details of their features will be given in upcoming sections.

Management Console Workspace

To learn how to access the **Management Console** please read this tutorial.



Altaro 1 ✓ Today at 01:00: Backed up 177.78 MB (compressed to 37.67 MB) for 2 files. (2 minutes)
Altaro 1 ✓ Yesterday at 01:00: Backed up 189.65 MB (compressed to 40.31 MB) for 2 files. (2 minutes)
Altaro 1 ✓ 09 June 2013 at 01:00: Backed up 210.4 MB (compressed to 38.54 MB) for 2 files. (2 minutes)
Altaro 1 ✓ 08 June 2013 at 01:00: Backed up 209.65 MB (compressed to 37.81 MB) for 2 files. (2 minutes)
Altaro 1 ✓ 07 June 2013 at 01:00: Backed up 136.65 MB (compressed to 29.84 MB) for 2 files. (2 minutes)
Altaro 1 ✓ 06 June 2013 at 17:18: Backed up 24.53 MB (compressed to 3.67 MB) for 2 files. (2 minutes)
Altaro 1 ✓ 06 June 2013 at 16:41: First Backup: 9.85 GB (compressed to 3.93 GB) backed up. (9 minutes)

<u>The Manager window has the following layout:</u>

- **Top Banner:** The top banner simply displays the product logo.
- **Top Status Bar:** This bar is divided into two sections:
  - **Section 1:** The primary and secondary backup drive status is shown here. The primary backup drive is also displayed as connected or disconnected.
  - **Section 2:** Here the last backup status is shown. If you have configured a secondary backup drive then the time stamp of the last synchronization between backup drives is shown too. Finally the number of pending changes for backup and the estimated time to the next backup is shown.
- **Left Hand Side Menu:** This menu allows users to Navigate to each section of the Management Console. Upon clicking on a section it will be displayed in the main panel at the center of the Manager screen.

Configuration Manager

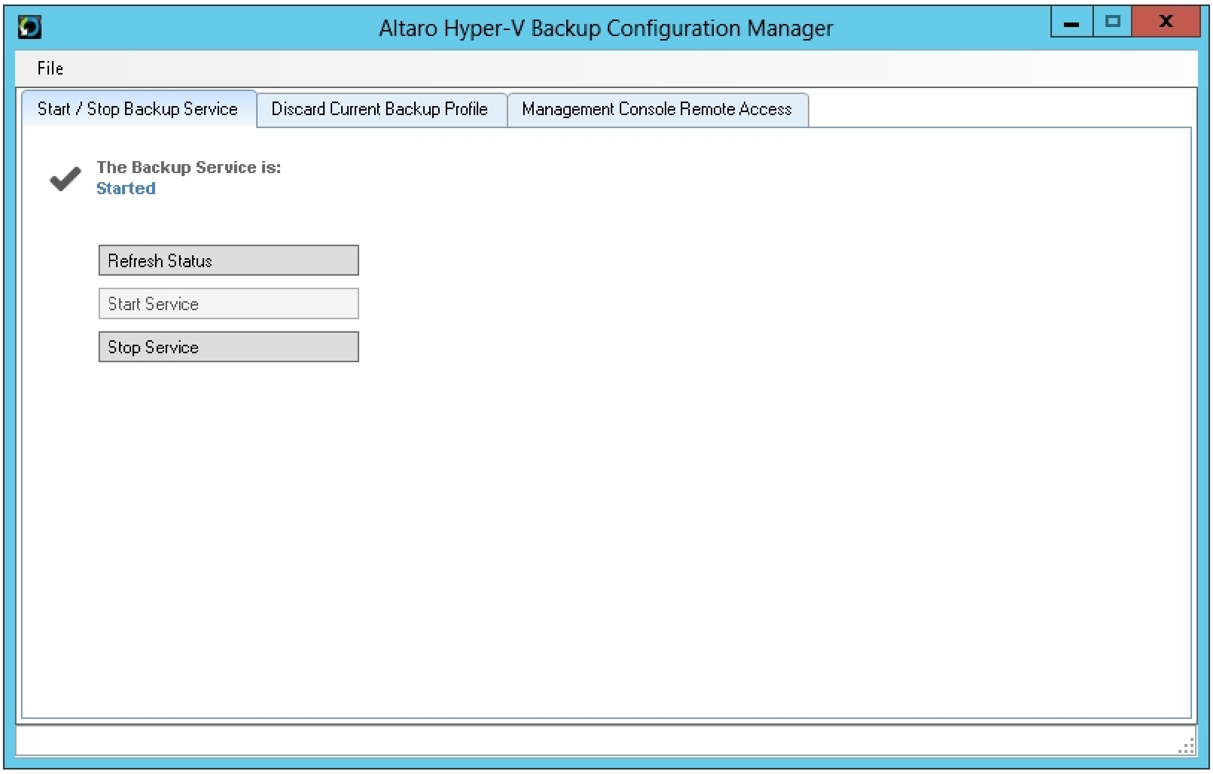
In **Altaro Hyper-V Backup** the user interface runs separately from the Backup Engine. The Backup Engine is deployed as a Windows Service and runs in the background. The Backup Engine Service performs the following operations:

- Backup schedules
- Backup operations
- Restore operations
- Scanning of backup folders for file changes
- Synchronization of the primary and secondary backup drives
- Sending of email backup reports and event log notifications
- Backup retention operations of old versions.

Should the user require stopping or starting the backup engine the configuration manager should be used. This application can be found within the Altaro Start Menu folder.

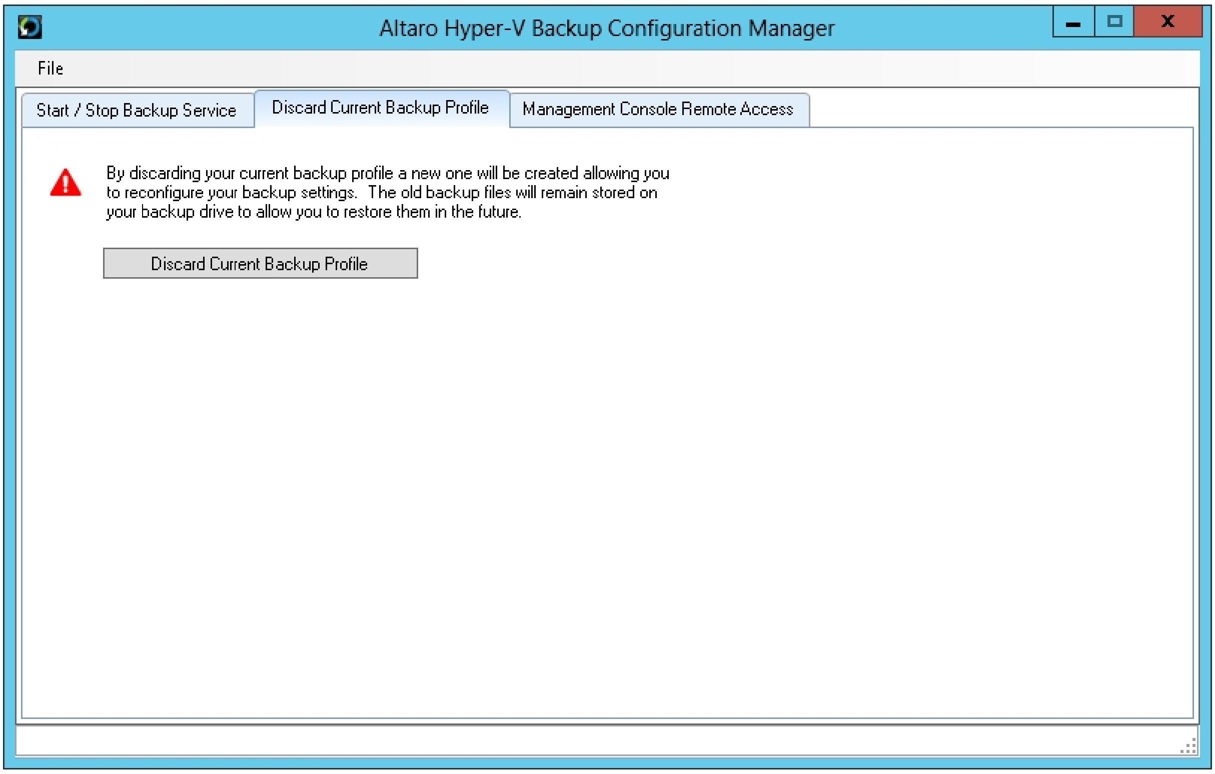
The interface of the configuration manager is made up of three tabs:

- **Start / Stop Backup Service:** This tab contains three buttons.
    - *Refresh:* updates the status of the backup engine.
    - *Stop:* stops the windows service from running. The service will start again when Windows is restarted.
    - *Start:* starts the windows service.


Altaro Hyper-V Backup Configuration Manager
File
Start / Stop Backup Service
Discard Current Backup Profile
Management Console Remote Access
Refresh Status
Start Service
Stop Service

The Backup Service is:
Started

- **Discard Current Backup Profile:** This tab allows the user to discard the current backup profile and start a new one. Once the old backup profile is discarded, Hyper-V Backup can be reconfigured using the Management Console as described here.

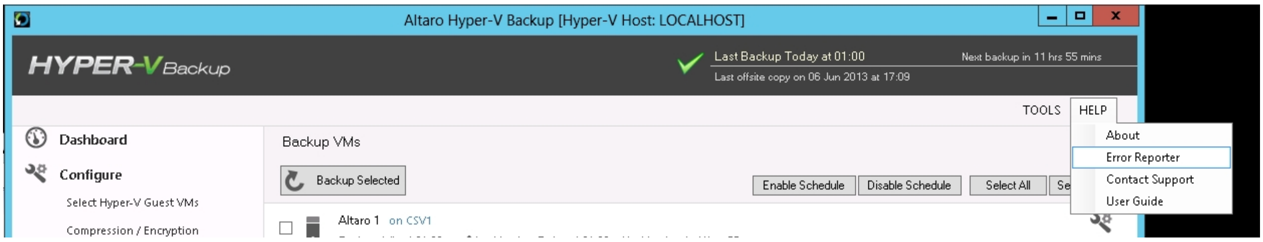

Altaro Hyper-V Backup Configuration Manager
File
Start / Stop Backup Service
Discard Current Backup Profile
Management Console Remote Access
Discard Current Backup Profile

By discarding your current backup profile a new one will be created allowing you to reconfigure your backup settings. The old backup files will remain stored on your backup drive to allow you to restore them in the future.

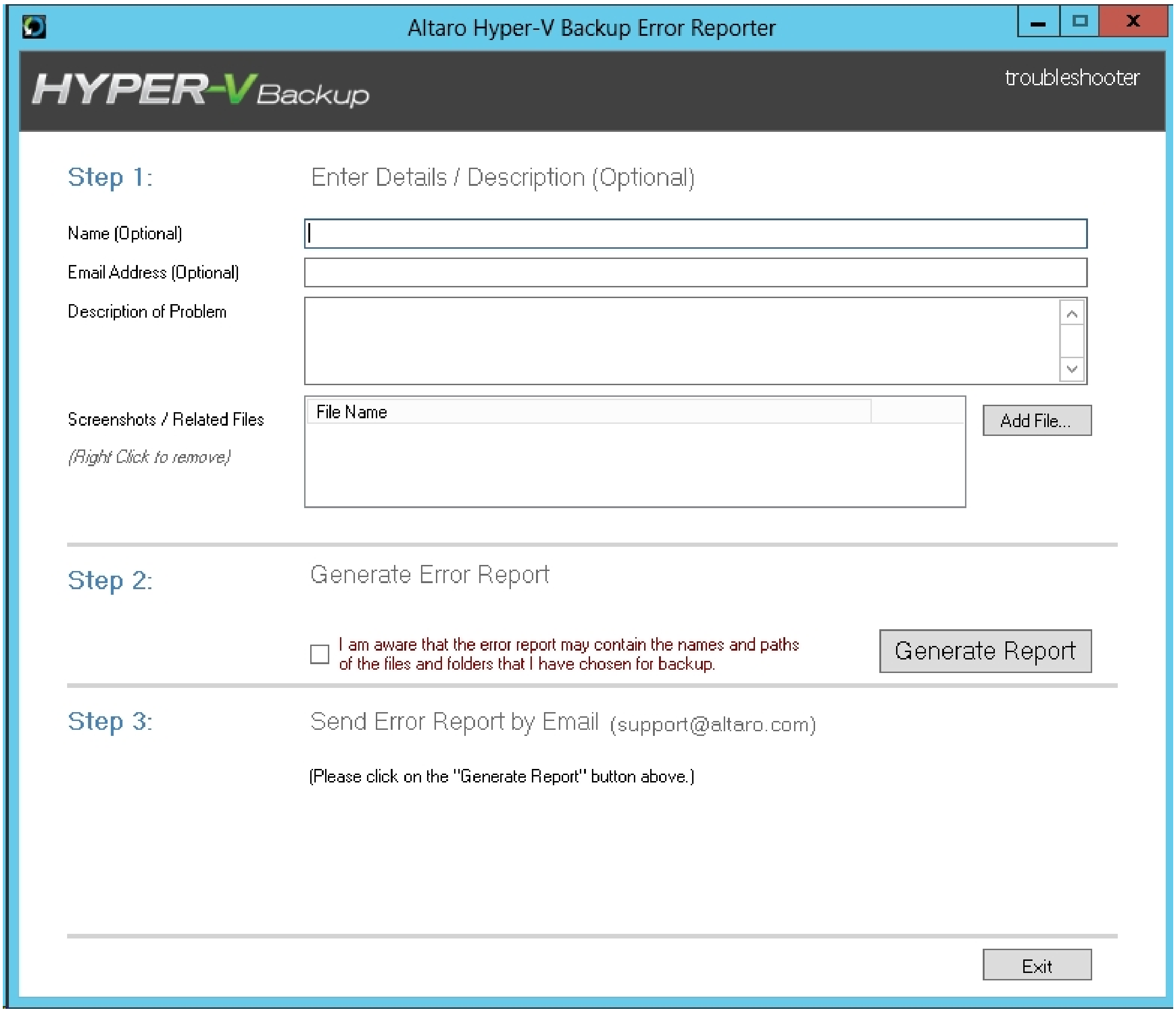
- **Switch to secondary backup drive:** This tab allows the user to switch to secondary backup drive as described here.

Error Reporter

The **Error Reporter** can be found in the Start Menu > All Programs > Altaro program group. Or from within the management console under Help >> Error reporter:



Once opened simply enter the error details, check the disclaimer check box and press generate. Next simply email the generated error report to Altaro.



Step 1: Enter Details / Description (Optional)

Name (Optional)

Email Address (Optional)

Description of Problem

Screenshots / Related Files *(Right Click to remove)*

Step 2: Generate Error Report

□ I am aware that the error report may contain the names and paths of the files and folders that I have chosen for backup.

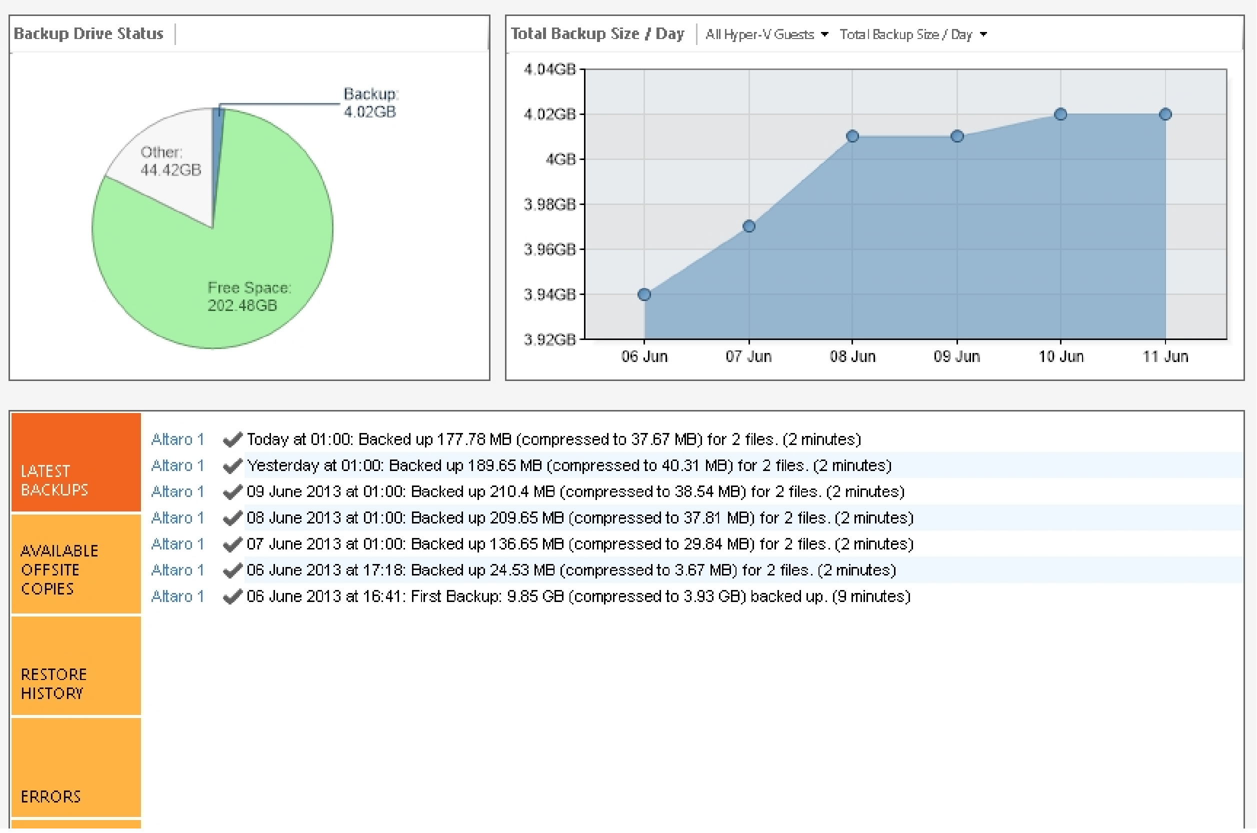
Step 3: Send Error Report by Email (support@altaro.com)

(Please click on the "Generate Report" button above.)

Dashboard

You can view the dashboard by opening the **Management Console**. Read here for instructions on how to do this.

- Charts & Statistics
- Backup History
- Restore History
- Errors since the last backup
- Cluster Status Tab



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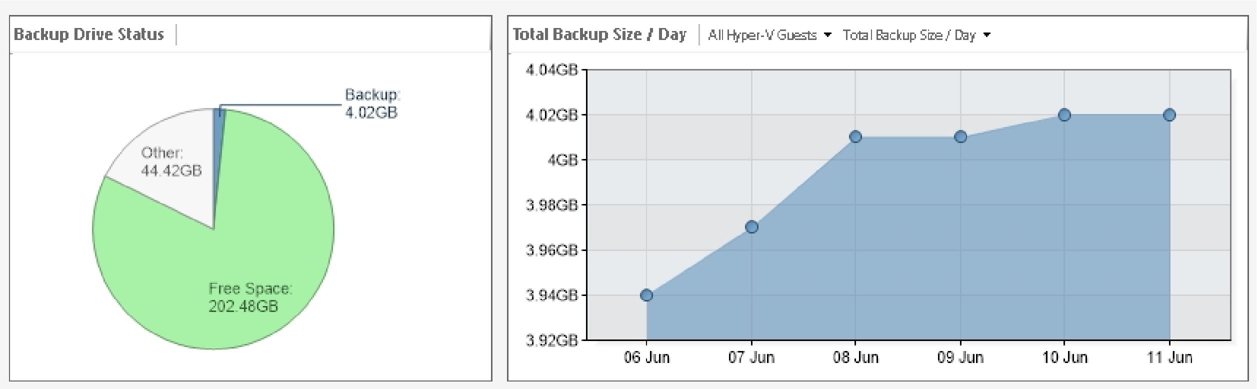
Charts & Statistics



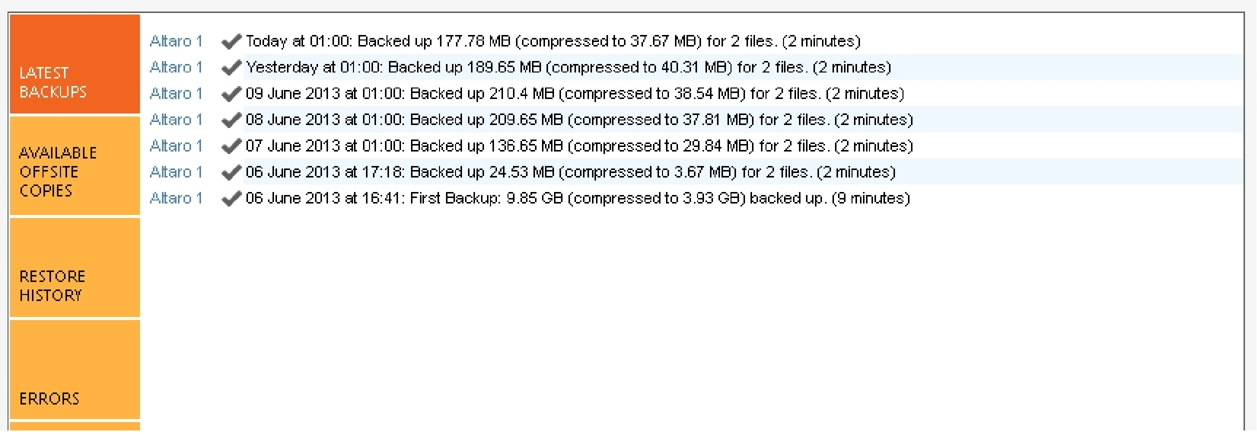
The top half of the dashboard displays a number of charts and statistics. The following charts are available:

- **Backup Drive Status:**
  - A pie chart displaying space used by your backup, other files and the remaining free space.
  - A pie chart displaying percentage of space allocated to each backup folder selected. Click on [Show backup Size/VM] to toggle this chart.

- **Backup Trends:** By default the graph displays the trend for all VMs, but a drop down list is available to view the trend for each VM separately.
  - A line chart displaying the total backup size / day.
  - A bar graph displaying the average backup duration / day.
  - A bar graph displaying the total data transferred / day.
  - A line chart displaying the total number of backups / day.

List of Latest Backups

In the bottom half of the Dashboard you will find a tab control with four reports.



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Altaro 1 ✓ 06 June 2013 at 16:41: First Backup: 9.85 GB (compressed to 3.93 GB) backed up. (9 minutes)

The first tab displays a list of the latest backups. The following information is displayed:

- The VM name that was backed up.
- Date and time of the backup.
- The backup status indicating whether the backup succeeded, succeeded with skipped files, or failed.
- The number of files backed up.
- The total size of the data that was backed up.
- The duration of the Backup.

View List of Skipped Files

Double-clicking on a backup which has a warning icon or error icon will bring up a list of files that were skipped during that backup. A reason why the file was skipped is also given.

View List of Backed up Files

Double-clicking on a successful backup will bring up a list of files that were backed up during that backup. Information on whether the file was created, changed, renamed or deleted is also given.

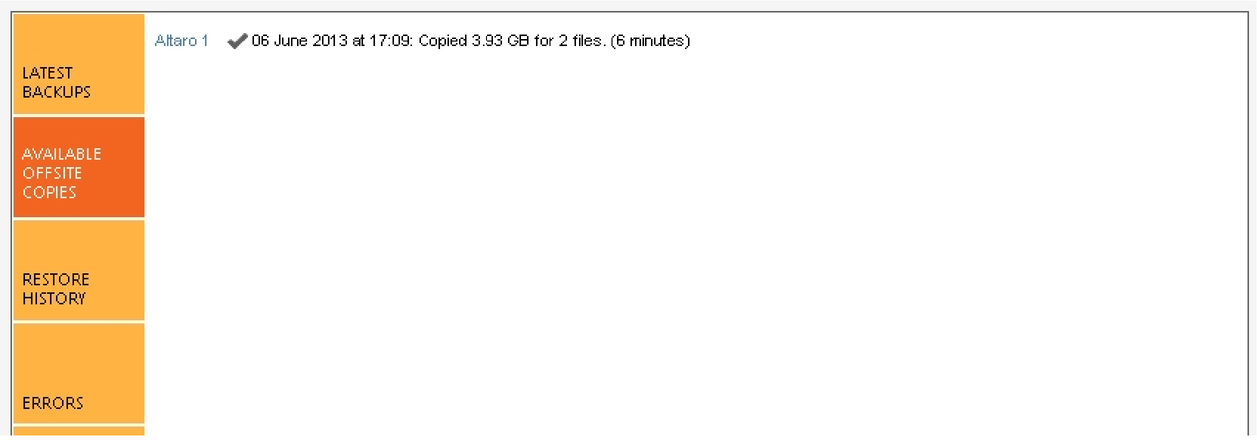
Alternatively you may right-click on a backup to bring up a context menu with all options.

View a Report of all older backups

This list will only display the most recent backups. At the bottom of the list you will find a link to view the complete backup history report.

List of Latest Offsite Copies

In the bottom half of the Dashboard you will find a tab control with four reports.



Altaro 1 ✓ 06 June 2013 at 17:09: Copied 3.93 GB for 2 files. (6 minutes)

The second tab displays a list of the latest Offsite Copies. The following information is displayed:

- Date and time of the backup.
- The backup status indicating whether the backup succeeded, succeeded with skipped files, or failed.

List of Latest Restores

In the bottom half of the Dashboard you will find a tab control with four reports.

The third tab displays a list of the latest restore operations. The following information is displayed:

- The VM name that was restored.
- Date and time of the restore operation.
- The restore status indicating whether the restore operation succeeded or failed.
- The duration of the restore operation..

View a Report of all older restore operations

This list will only display the most recent restore operations. At the bottom of the list you will find a link to view the complete restore history report.

List of Errors since Last Backup

The fourth tab displays a list of any errors that have occurred since the last successful backup. The following information is displayed:

- Date and time of the error.

- A description of the error.
- The error code.

This list will be cleared once the VM causing the error is backed up successfully.

Cluster Node Status Tab

Click here to read more about the Dashboard Cluster Node Tab.

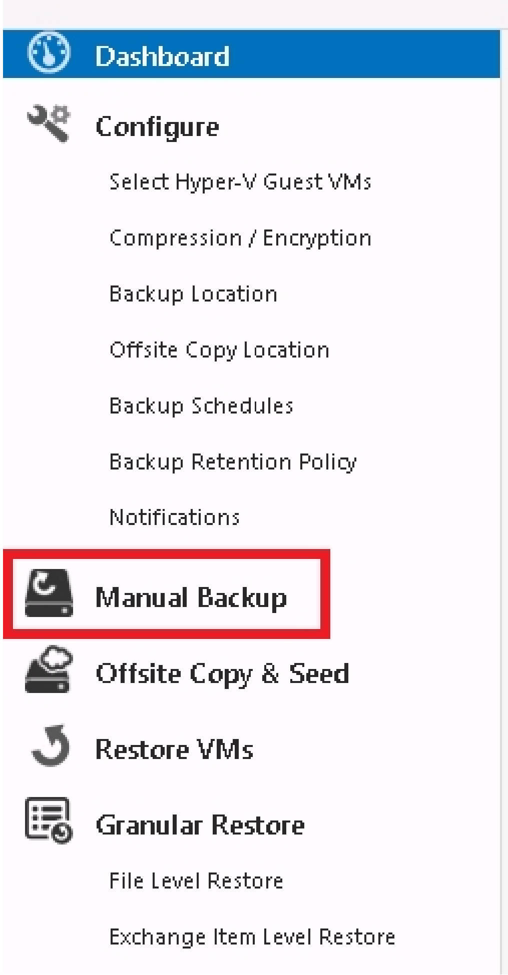
Backup

Access to the Backup section of the Management Console can be achieved as follows:

This can be achieved by following these steps:

1. Open the **Management Console** as described here.

2. Navigate to the "**Manual Backup**" menu item at the left hand side of the screen.



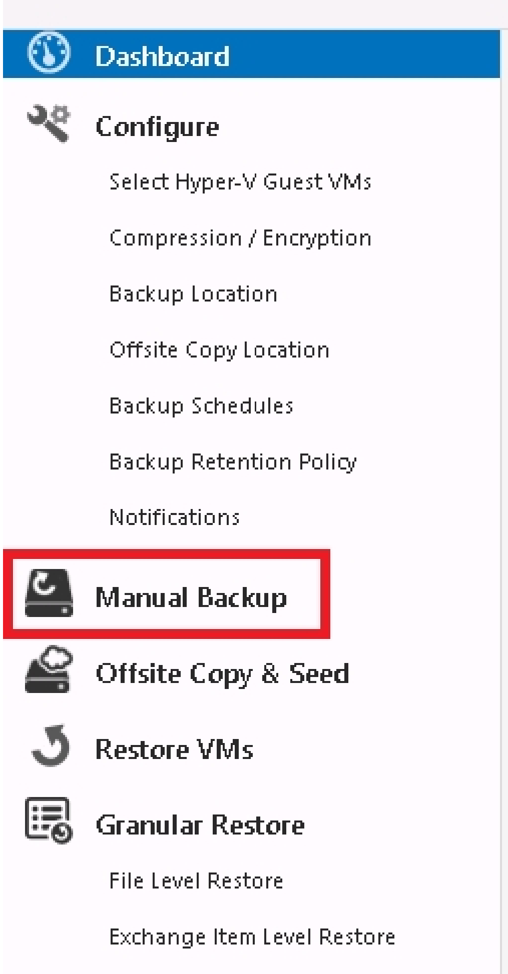
Backup Settings

Modifying Backup Settings for a VM is simple and can be achieved by navigating to the "Advanced Settings" window of each Guest VM.

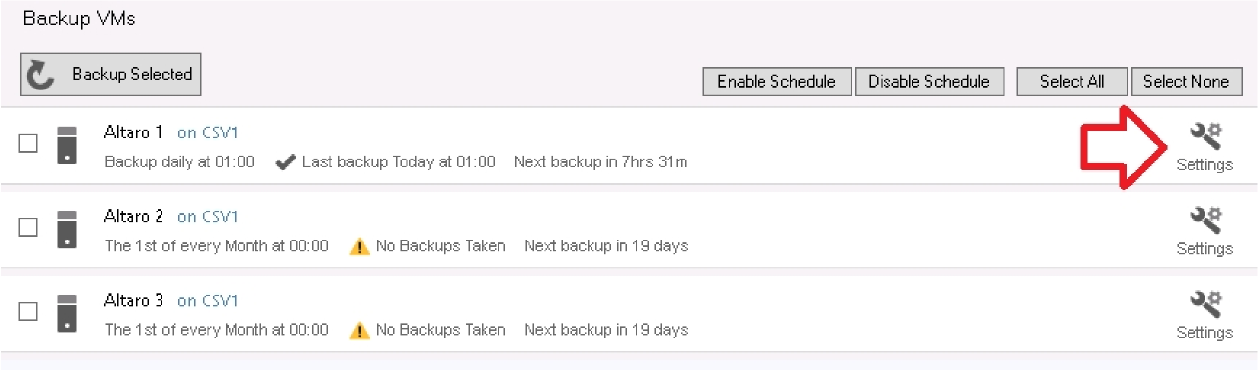
This can be achieved by following these steps:

1. Open the **Management Console** as described here.

2. Navigate to the "**Manual Backup**" screen.



3. You will be presented with the following screen. Please note the "Spanner and Wrench" icons to the right hand side of each VM.

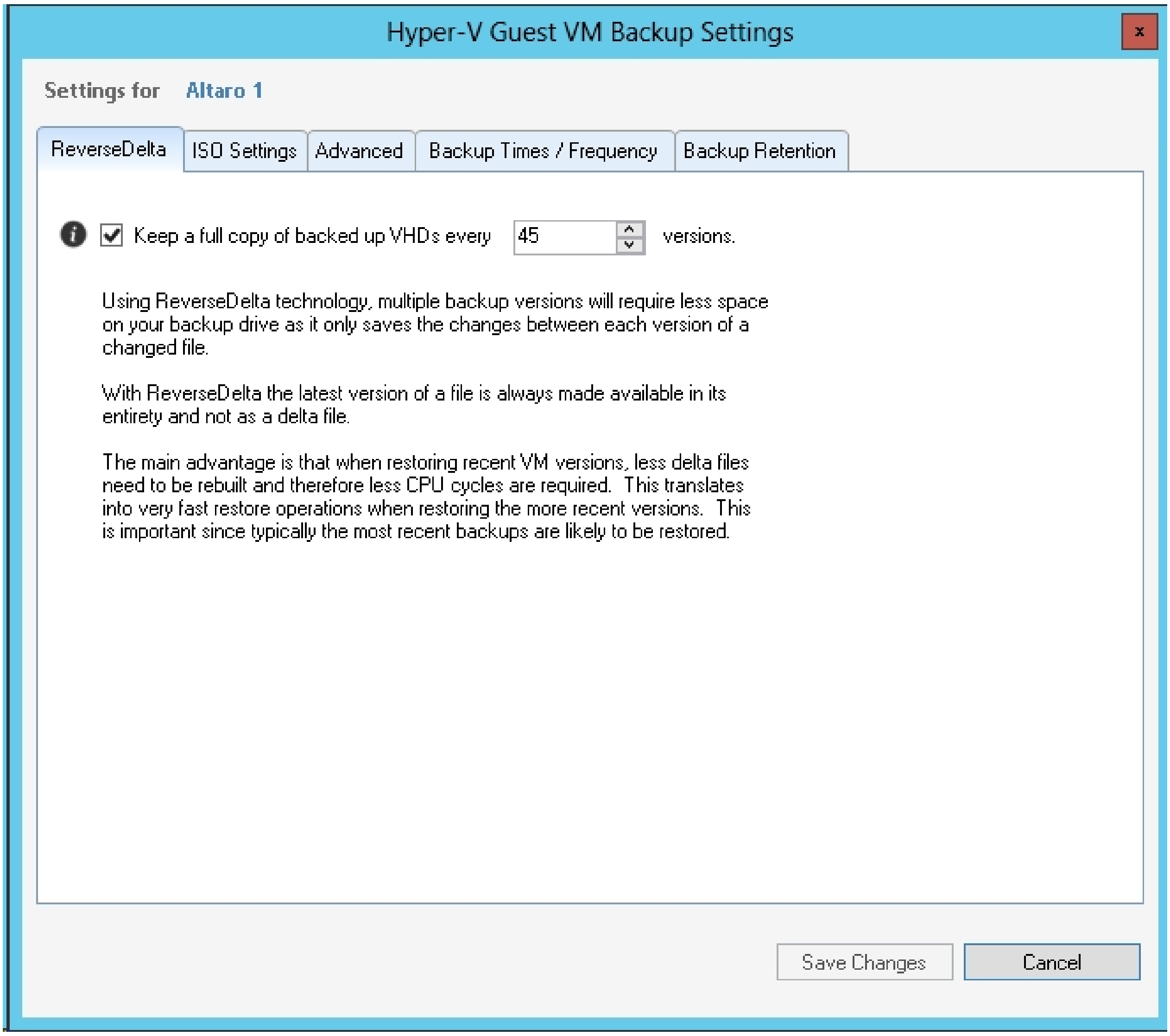


□ Altaro 1 on CSV1
Backup daily at 01:00 ✓ Last backup Today at 01:00 Next backup in 7hrs 31m

□ Altaro 2 on CSV1
The 1st of every Month at 00:00 ⚠ No Backups Taken Next backup in 19 days

□ Altaro 3 on CSV1
The 1st of every Month at 00:00 ⚠ No Backups Taken Next backup in 19 days

4. Clicking on a "Spanner and Wrench" icon will display the "Advanced Settings" window for the VM in question.



☑ Keep a full copy of backed up VHDs every 45 versions.

Using ReverseDelta technology, multiple backup versions will require less space on your backup drive as it only saves the changes between each version of a changed file.

With ReverseDelta the latest version of a file is always made available in its entirety and not as a delta file.

The main advantage is that when restoring recent VM versions, less delta files need to be rebuilt and therefore less CPU cycles are required. This translates into very fast restore operations when restoring the more recent versions. This is important since typically the most recent backups are likely to be restored.

5. From the advanced settings Window you can do the following:

- Choose how often to take a full copy backup version of the VM. This can be accessed from the **ReverseDelta** tab

- Choose whether to backup ISO files which are attached to the VM. Click here fore more details.

- Choose whether to enable Live Backups for Non-VSS Aware Guests (Crash-Consistent Backups). Click here fore more details.

Backing up Hyper-V Guest VMs

- Scheduled Backups
- Manual Backups
- VM Live Backups
- Requirements for Live Backup
- ISO Backups

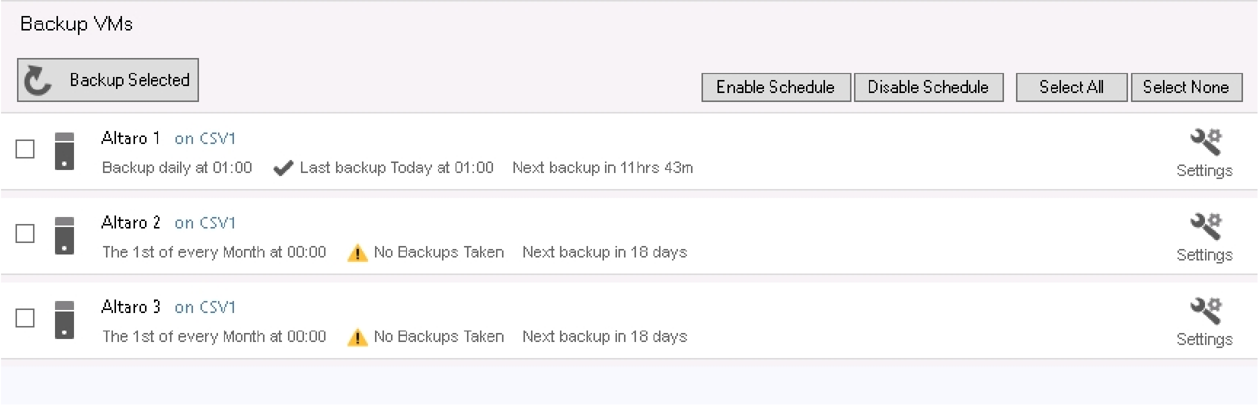
Scheduled Backups

To configure automatic scheduled backups please setup schedule groups as explained here.

Manual Backups

To take a manual backup first navigate to the **Manual Backup** screen as explained here.

You will now be presented by this screen:



□ Altaro 1 on CSV1
Backup daily at 01:00 ✓ Last backup Today at 01:00 Next backup in 11hrs 43m

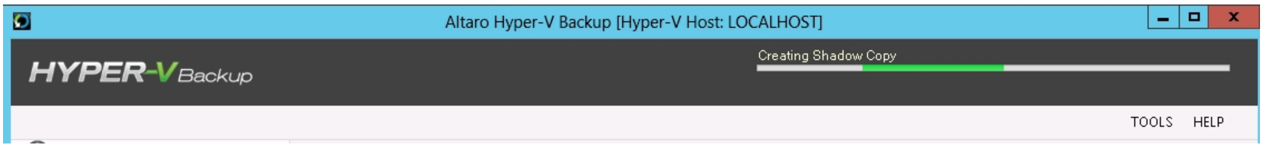
□ Altaro 2 on CSV1
The 1st of every Month at 00:00 ⚠ No Backups Taken Next backup in 18 days

□ Altaro 3 on CSV1
The 1st of every Month at 00:00 ⚠ No Backups Taken Next backup in 18 days

1. Select the VMs which you wish to backup now using the checkboxes to the left.

2. Click on the **Backup Selected** button at the top of the panel and the selected VMs will be backed up.

3. You will know that a backup is taking place because the progress bar at the top right of the Management Console will be active.



VM Live Backups

Before a backup is started, Altaro Hyper-V Backup creates a Volume Shadow Copy on the host machine. During this stage, Altaro Hyper-V Backup integrates with the Microsoft Hyper-V VSS writer in order to specify to the latter which virtual machines are about to be backed up.

In many cases, instead of saving the child VM while the shadow copy is being prepared, Hyper-V may use the VSS **inside the child VM**. This is called “cascading” the shadow copy or performing a "Child VM Snapshot".

The advantage of this method is that VSS aware applications running within the child VM, such as databases etc., may also flush their data to the VHD into a consistent state before the backup is taken, and this may be done without stopping the child VM or any of its running services.

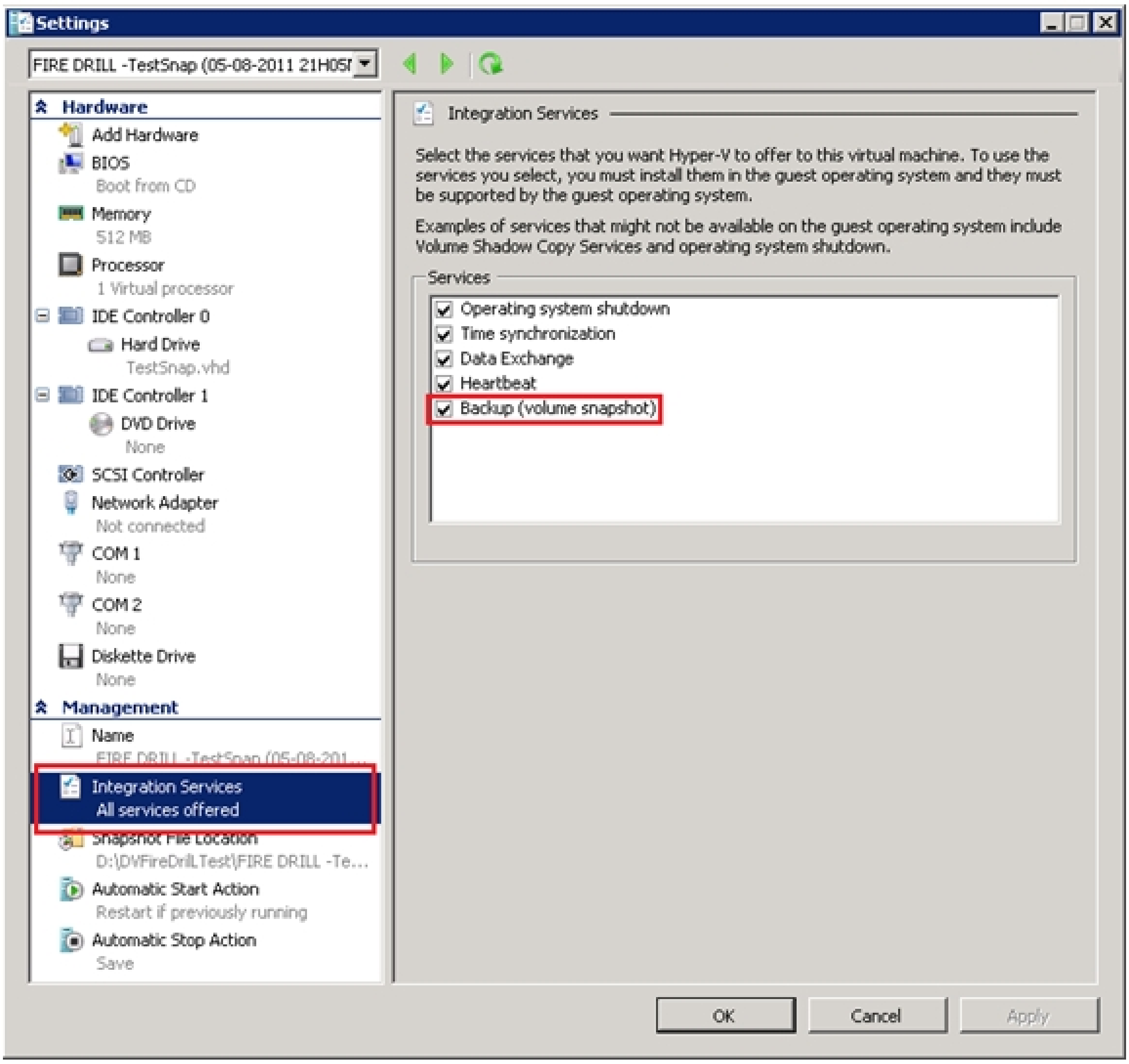
For this method to be supported, all of the following conditions must be met:

- Backup (volume snapshot) Integration Service is installed and running in the child VM. The service name is "Hyper-V Volume Shadow Copy Requestor".

Windows 2000: *Backup Integration Service is not supported.*

- The child VM must be in the running state.
- The Snapshot File Location for the VM is set to be the same volume in the host operating system as the VHD files for the VM.
- All volumes in the child VM are basic disks and there are no dynamic disks.
- All disks in the child VM must use a file system that supports snapshots (for example, NTFS).

The following screenshot shows the settings of a VM within the Hyper-V management window. For child VM snapshots to be enabled, the Integration services option “Backup (volume snapshot)” must be enabled:



Settings

FIRE DRILL -TestSnap (05-08-2011 21H05

Hardware
- Add Hardware
- BIOS: Boot from CD
- Memory: 512 MB
- Processor: 1 Virtual processor
- IDE Controller 0
  - Hard Drive: TestSnap.vhd
- IDE Controller 1
  - DVD Drive: None
- SCSI Controller
- Network Adapter: Not connected
- COM 1: None
- COM 2: None
- Diskette Drive: None

Management
- Name: FIRE DRILL -TestSnap (05-08-201...
- Integration Services: All services offered
- Snapshot File Location: D:\DVFireDrillTest\FIRE DRILL -Te...
- Automatic Start Action: Restart if previously running
- Automatic Stop Action: Save

Integration Services

Select the services that you want Hyper-V to offer to this virtual machine. To use the services you select, you must install them in the guest operating system and they must be supported by the guest operating system.

Examples of services that might not be available on the guest operating system include Volume Shadow Copy Services and operating system shutdown.

Services
- ☑ Operating system shutdown
- ☑ Time synchronization
- ☑ Data Exchange
- ☑ Heartbeat
- ☑ Backup (volume snapshot)

Requirements for Live Backups

- Backup (volume snapshot) Integration Service is installed and running in the child VM. The service name is "Hyper-V Volume Shadow Copy Requestor".
  Windows 2000: *Backup Integration Service is not supported.*

- The child VM must be in the running state.
- The Snapshot File Location for the VM is set to be the same volume in the host operating system as the VHD files for the VM.
- All volumes in the child VM are basic disks and there are no dynamic disks.
- All disks in the child VM must use a file system that supports snapshots (for example, NTFS).

Live Backups for non-VSS aware VMs

Some VMs may not have the option to cascade a Shadow Copy from the host in order to render any data transactionally consistent on the VHDs for that VM.

The reasons for this may be due to the fact that the OS does not support VSS shadow copies, for example Windows XP (pre-SP2), Windows 2000 or Linux VMs.

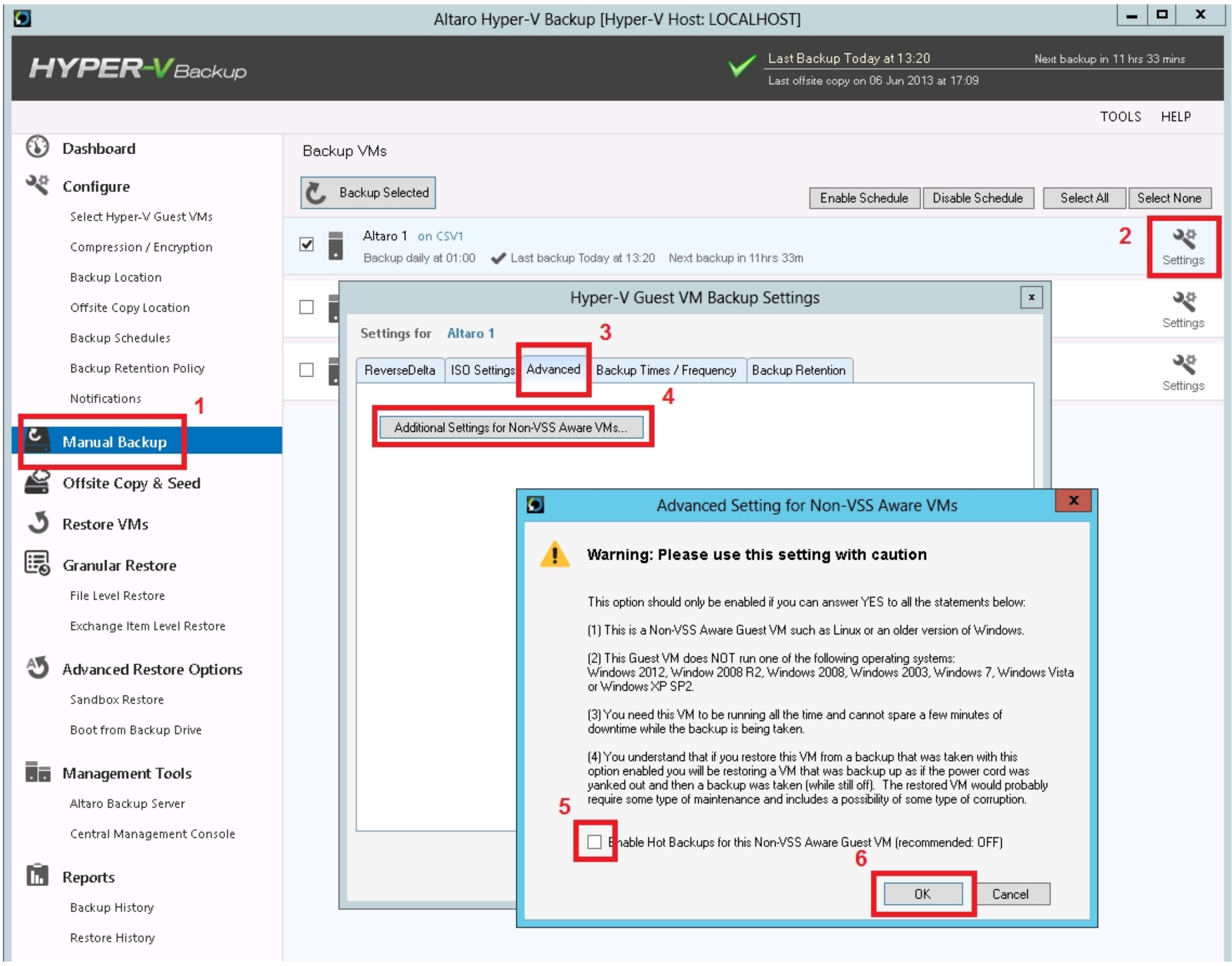
If these VMs are running at the time of a backup, the standard behavior of the Microsoft Hyper-V VSS Writer in this case is to **save** the VMs while the Shadow Copy is being taken on the host, and then restore the VMs to the running state once the Shadow Copy on the host is completed.

This ensures that the data on the VHDs for these VMs is in a consistent state during the backup.

Although this process rarely takes longer than a few seconds, this may not necessarily be the desired effect, since saving the VMs implies that the VMs will be taken offline for a specific time interval.

You may bypass this standard behavior by selecting a checkbox as follows:

1) Click on the “Manual Backup” option in the main panel to the left of the Management Console window.
2) Click on the Settings icon for the VM or VMs in question.
3) Click on the Advanced tab in the window that appears.
4) Click on “Additional Settings for Non-VSS Aware VMs” button.
5) Select the “Enable Hot Backups” checkbox.
6) Click OK.



Warning: Please use this setting with caution

This option should only be enabled if you can answer YES to all the statements below:

(1) This is a Non-VSS Aware Guest VM such as Linux or an older version of Windows.

(2) This Guest VM does NOT run one of the following operating systems:
Windows 2012, Window 2008 R2, Windows 2008, Windows 2003, Windows 7, Windows Vista or Windows XP SP2.

(3) You need this VM to be running all the time and cannot spare a few minutes of downtime while the backup is being taken.

(4) You understand that if you restore this VM from a backup that was taken with this option enabled you will be restoring a VM that was backup up as if the power cord was yanked out and then a backup was taken (while still off). The restored VM would probably require some type of maintenance and includes a possibility of some type of corruption.

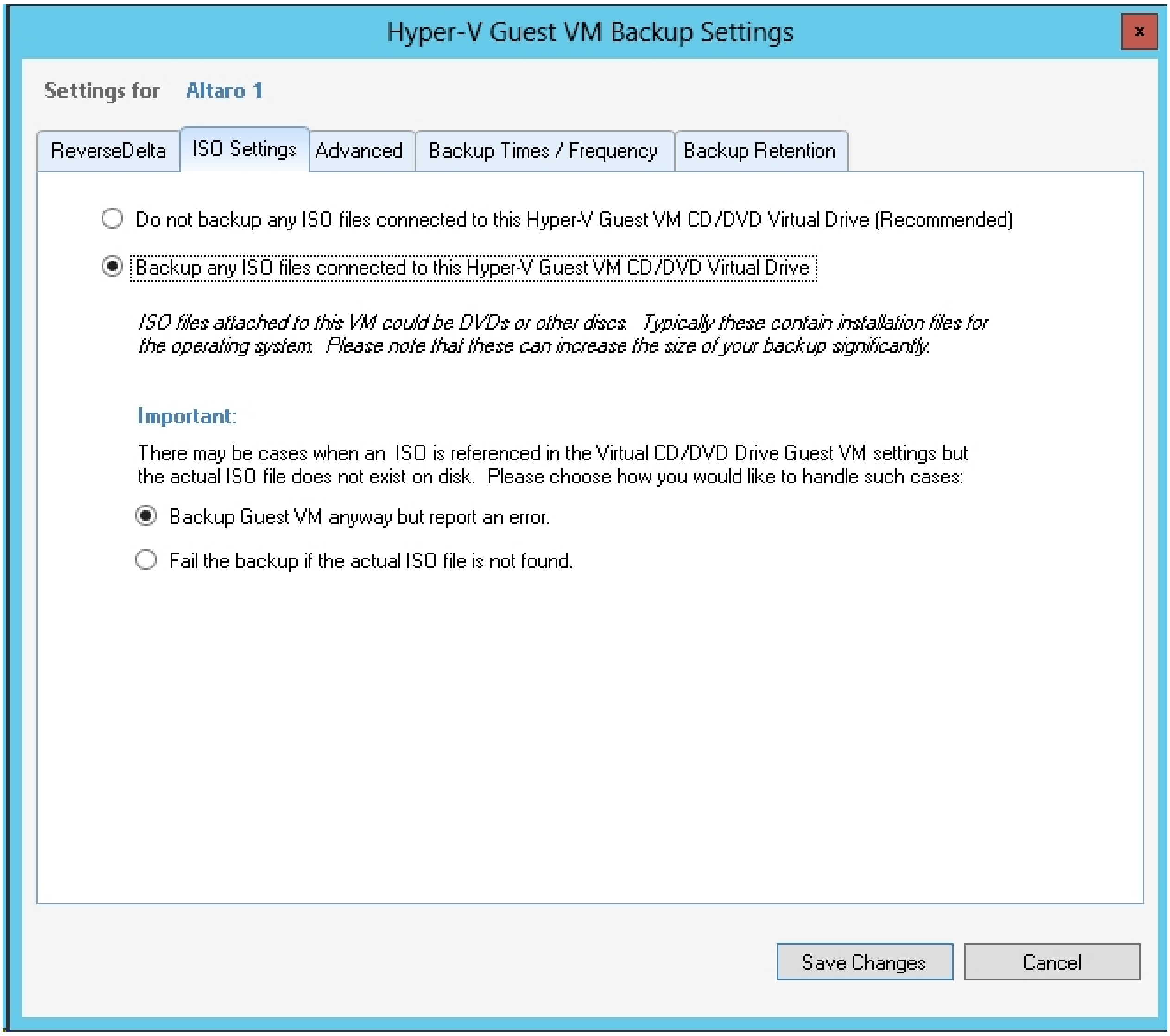
☐ Enable Hot Backups for this Non-VSS Aware Guest VM (recommended: OFF)

Note: Enabling this setting may lead to inconsistent data on the backup drive, so please read the warning carefully and make sure all the criteria are met before enabling this setting. It is recommended to leave this setting switched off unless you are sure of the implications of enabling this option. If in doubt, please do not hesitate to contact support@altaro.com

ISO Backups

Altaro Hyper-V Backup offers the possibility to back up any ISO files that are attached to any child VMs as CD or DVD image files. These many times are installation media, and do not need to be backed up (this is the default setting).

However, the image files could potentially contain data that should be backed up, and the “ISO Settings” tab in the VM settings offers this functionality, as shown in the following image:



Settings for Altaro 1

○ Do not backup any ISO files connected to this Hyper-V Guest VM CD/DVD Virtual Drive (Recommended)

● Backup any ISO files connected to this Hyper-V Guest VM CD/DVD Virtual Drive

ISO files attached to this VM could be DVDs or other discs. Typically these contain installation files for the operating system. Please note that these can increase the size of your backup significantly.

Important:

There may be cases when an ISO is referenced in the Virtual CD/DVD Drive Guest VM settings but the actual ISO file does not exist on disk. Please choose how you would like to handle such cases:

● Backup Guest VM anyway but report an error.

○ Fail the backup if the actual ISO file is not found.

Clicking the second radio button option will cause ISO files to be included in the backup. If a machine was backed up with this setting enabled, and is then restored, the ISO file is also restored along with the VM. In the case of a “Restore Overwrite”, the VM is not overwritten but a separate file is created in case the ISO file is in use by any other VM.

This setting may be enabled and disabled at will. If a previous version of a VM is restored from a backup time when this setting was enabled, then the ISO files are restored, even if the setting may have been disabled for subsequent backups.

An extra setting at the bottom of the window enables you to specify if the backups should continue or fail if any ISO files referenced in the configuration are not found. In both cases, a notification email is sent to warn about the missing file.

Microsoft VSS (Shadow Copy)

The Microsoft Volume Shadow Service (VSS) is Microsoft technology that forms part of Windows Server 2008 R2. This component allows applications to access a "point in time" snapshot of a logical drive on the host machine, including any VHD and related virtual machine files on that drive. This enables these files to be accessed even if they are in use or locked. It also ensured that the VHD and related files are in a consistent state and all data has been flushed to disk before they are accessed for backup purposes.

Altaro Hyper-V Backup comes with its own VSS Requester and communicates with the Microsoft Volume Shadow Copy Service in order to trigger off and release shadow copies on the host machine.

Important facts and FAQs:

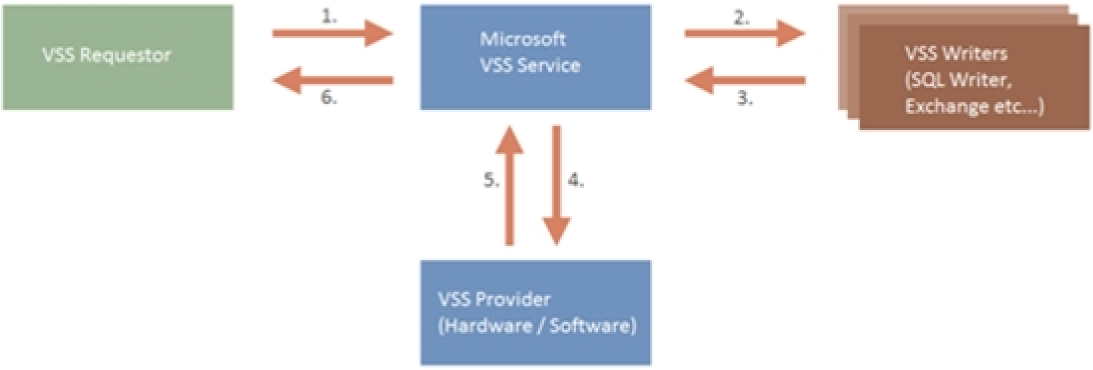
The Volume Shadow Copy service is a part of the Windows operating system and any malfunctions in this component are outside of the control of Altaro Hyper-V Backup, which acts only as a shadow copy "requester" and does not possess any shadow copy functionality per se.

Shadow copies are done on a Volume basis, and cannot be done on a particular folder set only.

A shadow copy operation does not result in all the data on a volume being copied over to a shadow copy, but rather a point in time is set and any changes (writes) to the volume contents from that point on are kept in a "changes" area. In that way a shadow copy can be completed in a matter of seconds.

The shadow copy requested by Altaro Hyper-V backup is non-persistent and is disposed after a particular backup operation completes.

The overall process may be visualized in the following diagram, which is a considerably simplified version of what actually happens, but offers a good birds-eye view:


VSS Requestor
1.
6.
Microsoft VSS Service
2.
3.
VSS Writers (SQL Writer, Exchange etc...)
5.
4.
VSS Provider (Hardware / Software)

Altaro Hyper-V Backup first requests a list of VSS writers from the VSS service and then requests that all the writers affected start preparing for the shadow copy by making their data consistent on the disk. Once this is done, the VSS communicates with the VSS provider which actually executes the point in time snapshot. The VSS service then informs Altaro Hyper-V Backup about the details of the newly created shadow copy.

After the backup completes, Altaro Hyper-V Backup instructs the VSS service to release the shadow copy.

MS Hyper-V VSS Writer

One of the writers on a 2008 R2 (and upward) system is called the Hyper-V VSS Writer, and this writer manages the shadow Copy of all files related to the virtual machines running on the host machine, such as the VHD files. When Altaro Hyper-V Backup triggers off a shadow copy (just before a backup starts), it integrates with the Hyper-V VSS writer and passes on information to this writer about which virtual machines are about to be backed up.

In turn, Hyper-V uses one of two mechanisms to prepare each VM for backup. The default backup mechanism is called the "Saved State" method, where the VM is put into a saved state during the processing of the shadow copy, snapshots are taken of the appropriate volumes, and the VM is returned to the previous state after the shadow copy.

The other backup mechanism is called the "Child VM Snapshot" method, which will be discussed here.

ReverseDelta

RD 3 is now available with Altaro Hyper-V Backup version 4.0

Definition of Reverse Delta

Reverse Delta 3 offers two advantages:

1. It is a space-saving technology developed by Altaro Software that enables Altaro Hyper-V Backup to keep only the changes between each version of a changed VHD (or VHDX) file and another, rather than storing the version of a file as a whole file every time it is changed.

This means that keeping multiple backup versions will require less space on your backup drive. In other terms, chunks of a VHD file that are unchanged from one version of that file to the next are only stored once on the backup disk. This is called data deduplication.

2. It also enables Altaro Hyper-V Backup to transfer only the changed blocks in a VHD file when there is already a full backup available on the backup location, making incremental backups much faster than the first backup. Notwithstanding this, the latest version of a VHD file is always stored as a full file on the backup location.

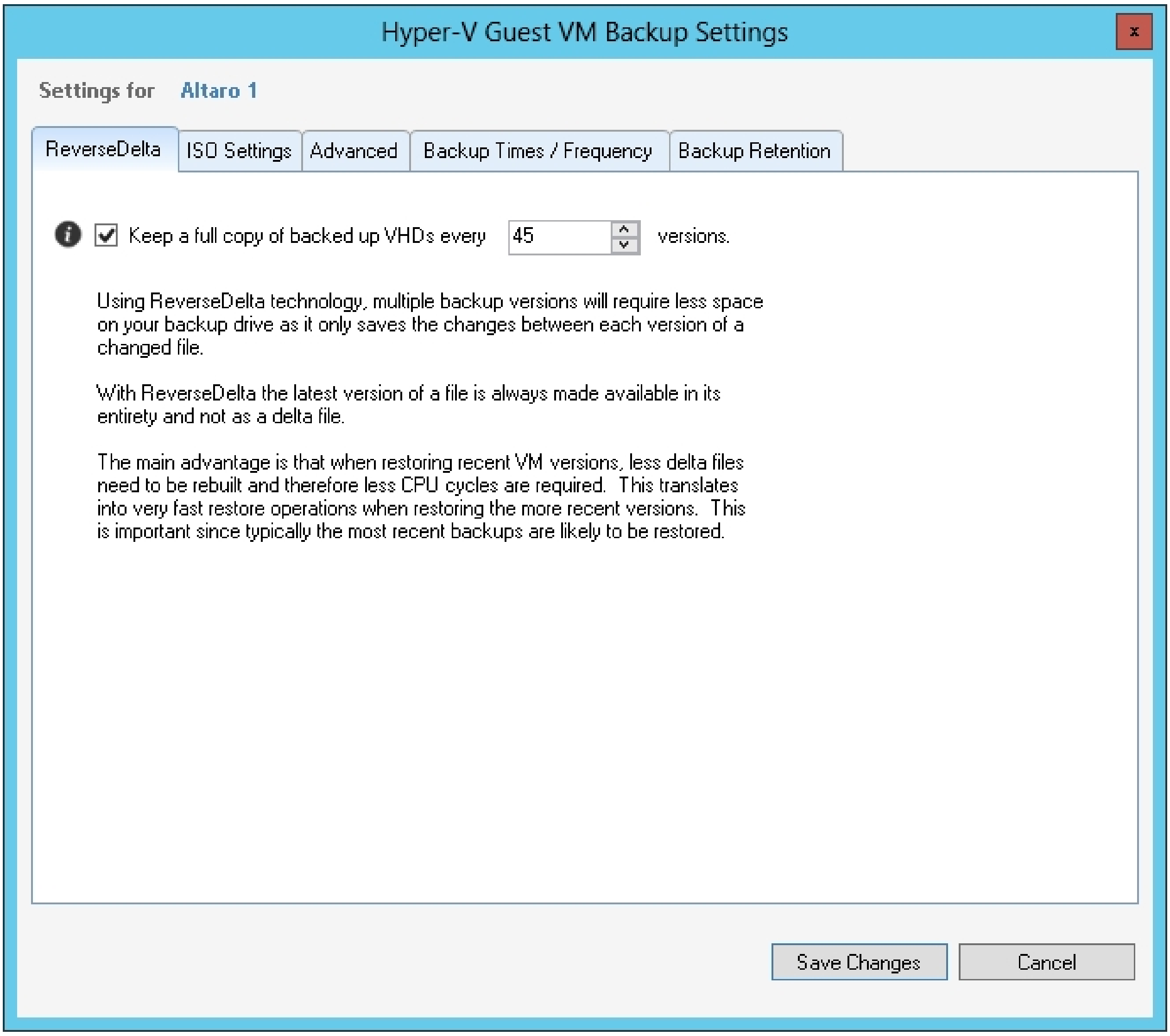
What distinguishes Reverse Delta from other deduplication technologies?

The main concern about delta files is usually that in the event of heavy data loss, the version of a file you are most likely to need is the latest one. Many users are apprehensive if this version may need to be rebuilt from an older version and one or more delta files. With Reverse Delta, the latest version of a file is always made available in its entirety and not as a delta file.

This means that if you require the latest version of a file, it is possible to access it directly from your backup drive without having to rebuild the file from delta files. The delta files are only used if you want to build a previous version of the file, building one delta file at a time for each version as you travel back in time in the reverse direction.

Periodically keeping full versions of the files

In the Advanced Settings window in Altaro Hyper-V Backup, there is an option to keep a full copy of a file every X versions as shown in the screenshot below:



☑ Keep a full copy of backed up VHDs every 45 versions.

Using ReverseDelta technology, multiple backup versions will require less space on your backup drive as it only saves the changes between each version of a changed file.

With ReverseDelta the latest version of a file is always made available in its entirety and not as a delta file.

The main advantage is that when restoring recent VM versions, less delta files need to be rebuilt and therefore less CPU cycles are required. This translates into very fast restore operations when restoring the more recent versions. This is important since typically the most recent backups are likely to be restored.

Let's say we have a large file, say a 100GB VHD file, which is constantly changing and needs to be backed up every hour. The first backup is for example at 9:00am. When you back up that file the first time, it is simply copied over to the destination.

At 10:00am, it is copied over again, and at 11:00pm again and so on.

Without Reverse Delta, at this point we have 3 full versions on the backup drive: 9:00am, 10:00am, and 11:00am. That would mean 300GB are required on the backup drive in three hours, which is rather excessive.

Altaro Hyper-V Backup however creates delta files of the older files (9:00am and 10:00am) so that our latest file (11:00am) is available as a full file. The delta file is usually much smaller than the full file, and will typically be less than 10% of the size original file.

Number of delta files to keep by example:

If we choose "keep full file every 30 versions", this means that every 30 backups, the delta file is not taken, so that you never have more than 30 delta files to rebuild if you need to restore a file.

Let's say you set this setting to "5". The picture would look like this:

Full file 10:00pm (Latest, 100GB)

delta 9:00pm

delta 8:00pm

delta 7:00pm

delta 6:00pm

Full file 5:00pm (100GB)

delta 4:00pm

delta 3:00pm

delta 2:00pm

delta 1:00pm

Full file 12:00pm (100GB)

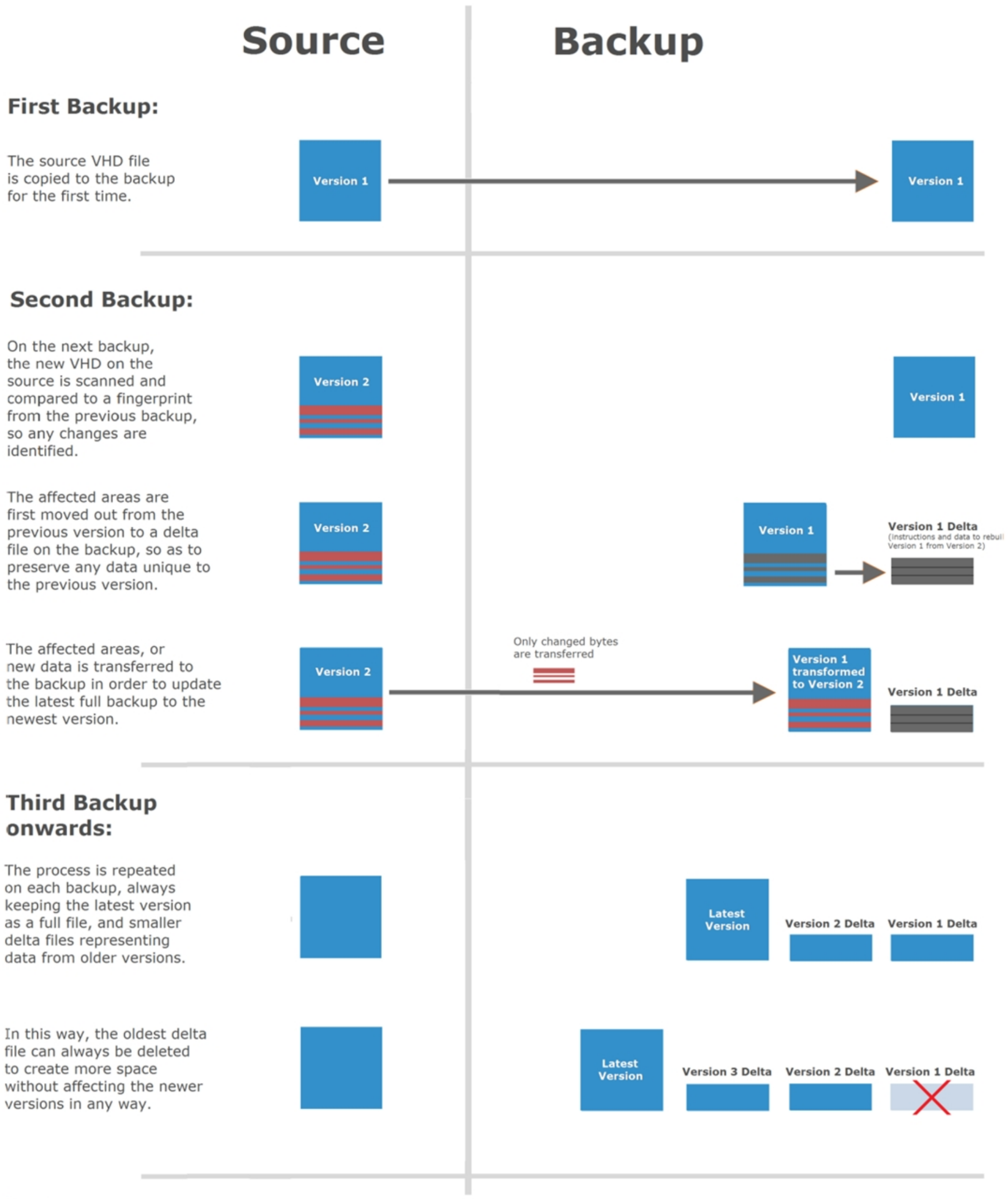
etc.. etc.

If you need to restore the 2:00pm file, then Altaro Hyper-V Backup starts from the 5pm full file, adds on the 4:00pm delta, 3:00 pm delta and finally, the 2:00pm delta. These steps take some time, so this setting ensures that you are never too far away from a full file. This of course happens in the background and is totally abstracted from the user.

With Version 3.0 of Altaro Hyper-V Backup, the recommended value for this setting is around 30.

Visual representation of the Reverse Delta process:

The following image shows the way the process works in 5 steps. Step 6 shows a restoration procedure.



First Backup:

The source VHD file is copied to the backup for the first time.

Second Backup:

On the next backup, the new VHD on the source is scanned and compared to a fingerprint from the previous backup, so any changes are identified.

The affected areas are first moved out from the previous version to a delta file on the backup, so as to preserve any data unique to the previous version.

The affected areas, or new data is transferred to the backup in order to update the latest full backup to the newest version.

Third Backup onwards:

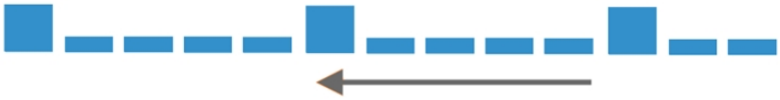
The process is repeated on each backup, always keeping the latest version as a full file, and smaller delta files representing data from older versions.

In this way, the oldest delta file can always be deleted to create more space without affecting the newer versions in any way.

Restores:

Older versions are restored by first restoring the latest VHD, then applying the previous delta over that in order to rebuild the previous version, then applying the delta before that and so on, always going one version further back in time.

NOTE:
A full version of the file is usually left on the backup drive every N versions (5 in this example).
In this way, dependency chains are kept short, avoiding lengthy restore procedures. This feature can be disabled if the backup space available is limited, or retention periods are relatively short.



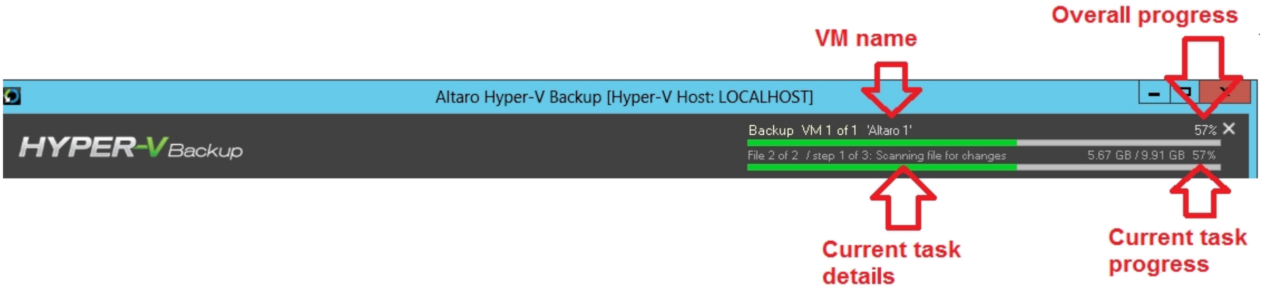
Display of Backup Progress with Reverse Delta

With Reverse Delta Version 2 (available in Altaro Hyper-V Backup version 3.0), the progress bar during a backup now shows further details about the current activity.

The main progress bar will show the current progress of the backup as in previous versions of Altaro Hyper-V Backup. However, when the software is creating a delta file, the main progress bar is paused, and the current "fine grain" progress showing the deduplication (or delta file creation).

Once the deduplication progress is complete, the next file is started and the main progress bar will resume.

This is shown in the image below:



Altaro Hyper-V Backup [Hyper-V Host: LOCALHOST]

Backup VM 1 of 1 'Altaro 1' 57%

File 2 of 2 / step 1 of 3: Scanning file for changes 5.67 GB / 9.91 GB 57%

Backup Retention

Backup Retention can be configured from the new Retention Policy settings screen as explained here.

Once within the the VM Backup Settings screen select the "**Backup Retention**" tab and you can choose to limit which old versions to keep by version age. Don't forget to set a backup retention schedule otherwise it will not run.

You can learn more on how backup retention works here.

You can also learn on how to manually delete old versions here.

Cluster Support

Altaro Hyper-V Backup supports backing up virtual machines that are running on a failover cluster node, both if they are using cluster shared volumes (CSVs) or not.

Cluster Shared Volumes

Cluster Shared Volumes or CSVs are shared storage devices, usually on SANs and similar hardware, which are accessible from all nodes in a failover cluster. Altaro Hyper-V Backup supports backing up VMs that have data stored on CSVs. This is done by indicating to the Shadow Copy component that a backup of a VM on the failover cluster is about to begin. The node on which Altaro Hyper-V Backup is installed temporarily takes ownership of the CSV and enables redirected I/O. This enables the node to perform a shadow copy operation on the CSV. Once the backup is completed, redirected I/O is once again disabled.

Read this chapter for details on how to configure Altaro Hyper-V Backup in a Cluster Environment.

Restore

Restoring Hyper-V Guest VMs

There are five options when it comes to restoring a Hyper-V Guest VM:

1. **Restore Overwrite**

   The Hyper-V Guest VM backup will be restored back to its original location and will retain the same name. If the original Hyper-V guest is still hosted by the Hyper-V server then it will be overwritten.

   Read more here.

2. **Restore as Clone**

   The Hyper-V Guest VM backup will be restored to a new location and will be given a new name. The original Hyper-V guest will not be overwritten and you will end up with the cloned VM running side by side with the original VM.

   Read more here.

3. **Restore to a different Hyper-V Server**

   A Hyper-V Guest VM backup which was taken by Hyper-V host A can be restored to Hyper-V host B. The VM will be restored to a new location on the new host and will be given a new name.

   Read more here.

4. **Sandbox Restore**

   This feature allows you to perform test restores of your backed up Hyper-V Guest VMs.

   Read more here.

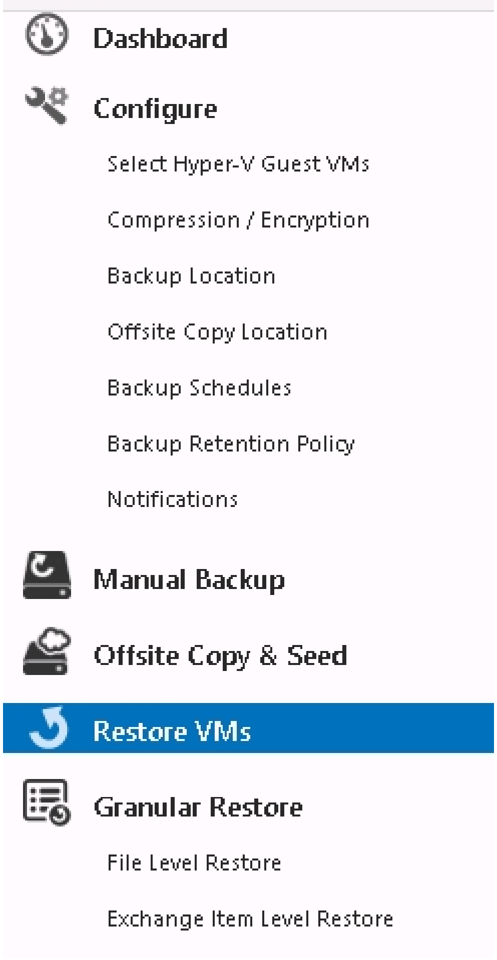
5. **File Level Restore**

   This feature allows you to restore individual files and folders from any Guest VM backup.

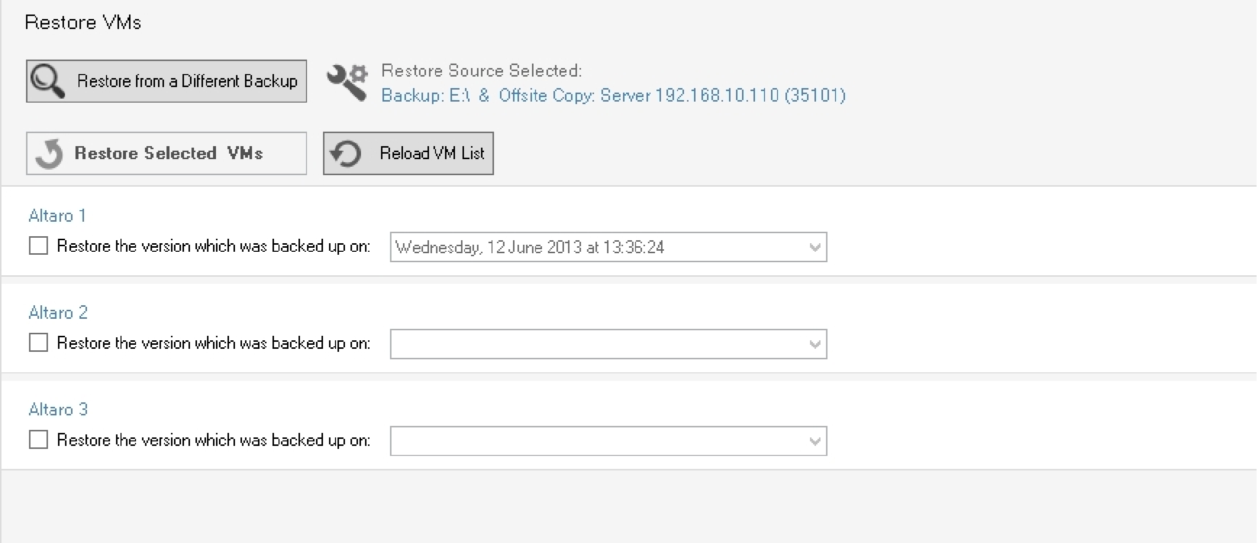
Read more here.

Restore Overwrite

To Restore Overwrite a VM backup first navigate to the **Restore VMs** screen as below:



You will now be presented by this screen:



Restore Source Selected:
Backup: E:\ & Offsite Copy: Server 192.168.10.110 (35101)

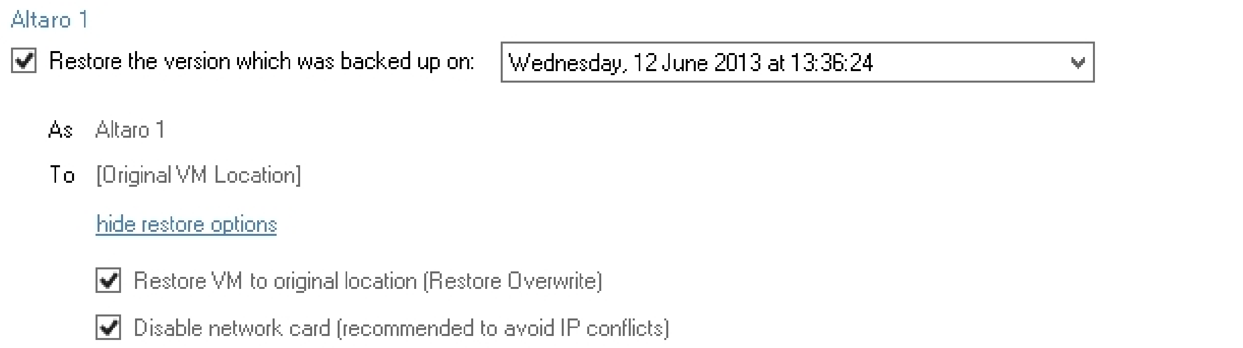
Altaro 1
□ Restore the version which was backed up on: Wednesday, 12 June 2013 at 13:36:24

Altaro 2
□ Restore the version which was backed up on:

Altaro 3
□ Restore the version which was backed up on:

1. Select the VMs which you wish to restore now using the checkboxes to the left, and then click the

Show Restore Options link in blue.



Altaro 1

☑ Restore the version which was backed up on: Wednesday, 12 June 2013 at 13:36:24

As Altaro 1

To [Original VM Location]

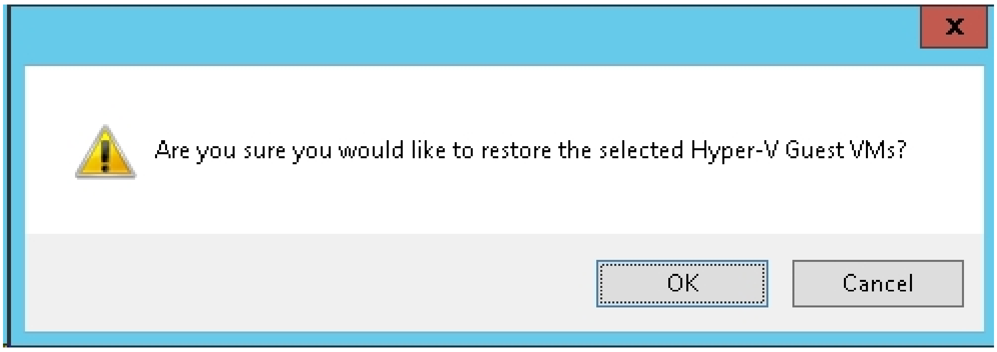
hide restore options

☑ Restore VM to original location (Restore Overwrite)

☑ Disable network card (recommended to avoid IP conflicts)

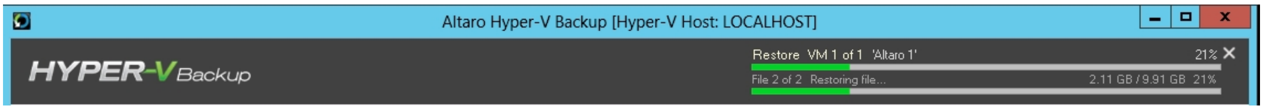
2. Here, choose the version you wish to restore from the drop down, then tick option to **'Restore VM to original location'** as above.

3. Click on the **Restore Selected VMs** button at the top of the panel to proceed. Then click **OK** at the prompt to confirm your selection:



Are you sure you would like to restore the selected Hyper-V Guest VMs?

4. You will know that a restore is taking place because the progress bar at the top right of the Management Console will be active.

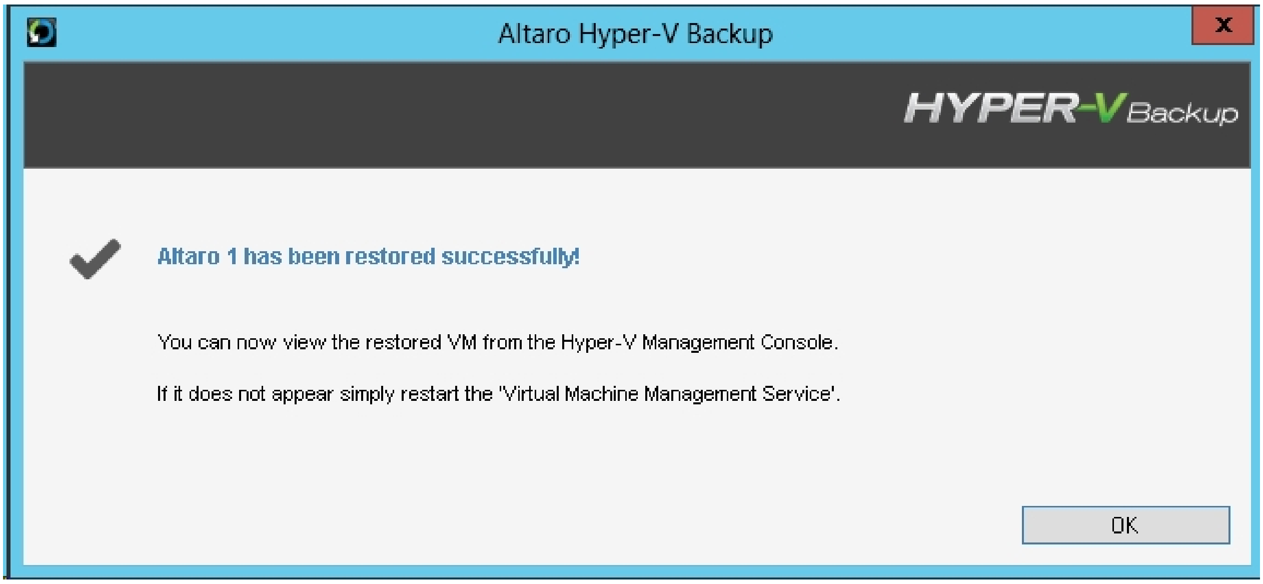


Altaro Hyper-V Backup [Hyper-V Host: LOCALHOST]

Restore VM 1 of 1 'Altaro 1' 21%

File 2 of 2 Restoring file... 2.11 GB / 9.91 GB 21%

9. Finally you will be notified that the restore is completed by a popup dialog, email and event log notifications if they are enabled.



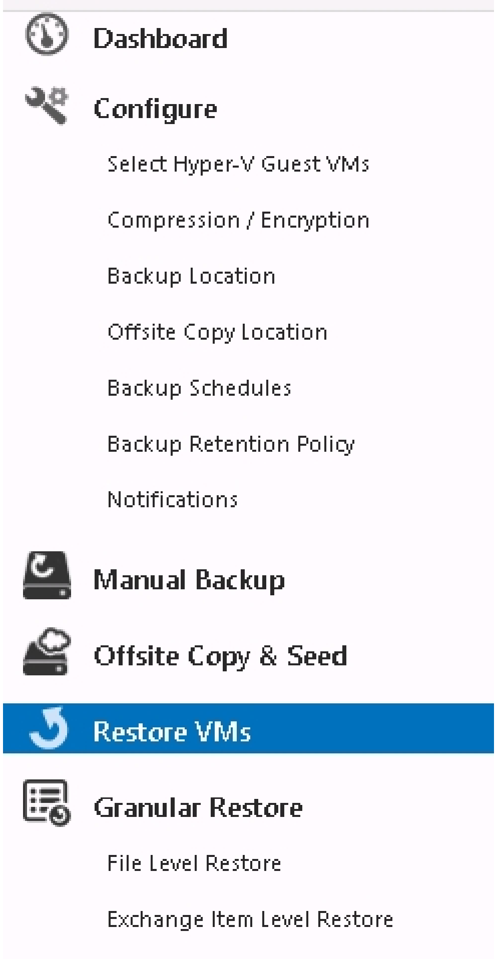
Altaro 1 has been restored successfully!

You can now view the restored VM from the Hyper-V Management Console.

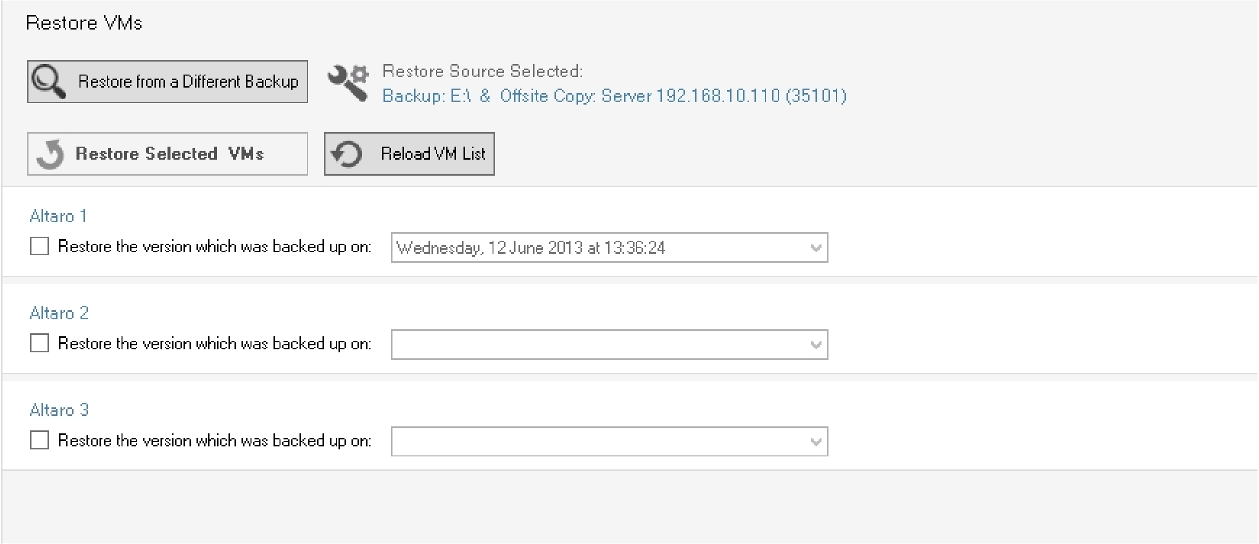
If it does not appear simply restart the 'Virtual Machine Management Service'.

Restore Clone

To Restore as Clone a VM backup first navigate to the **Restore VMs** screen as shown below:



You will now be presented by this screen:



Restore VMs

Restore from a Different Backup

Restore Source Selected:
Backup: E:\ & Offsite Copy: Server 192.168.10.110 (35101)

Restore Selected VMs

Reload VM List

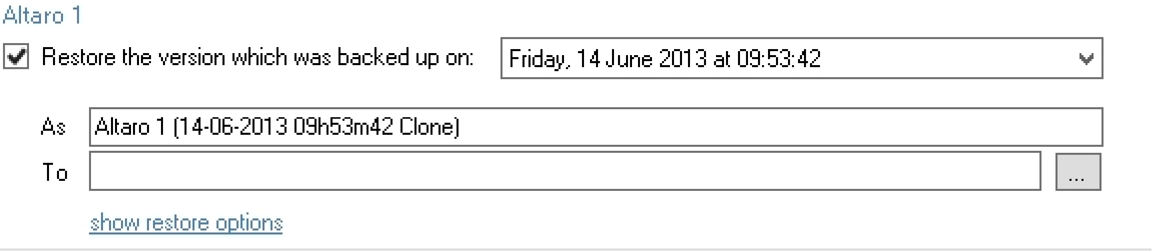
Altaro 1
☐ Restore the version which was backed up on: Wednesday, 12 June 2013 at 13:36:24

Altaro 2
☐ Restore the version which was backed up on:

Altaro 3
☐ Restore the version which was backed up on:

1. Select the VMs which you wish to restore as clones using the checkboxes to the left.

2. You will now be presented with the Restore options as shown below:



Altaro 1
☑ Restore the version which was backed up on: Friday, 14 June 2013 at 09:53:42

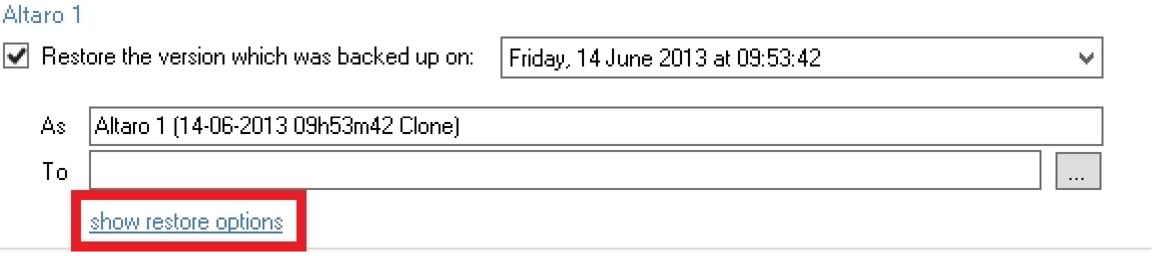
As: Altaro 1 (14-06-2013 09h53m42 Clone)

To:

show restore options

5. You can use the backup time combobox to choose to restore a previous version of the VM. You will also be prompted to enter a new name for the Cloned VM as well as the restore location.

By default the network card of the new cloned VM will be disabled so as to prevent IP Conflicts. You can choose not to disable the network card by first clicking the "show restore options" link as below, then unchecking the checkbox "Disabled Network Card".

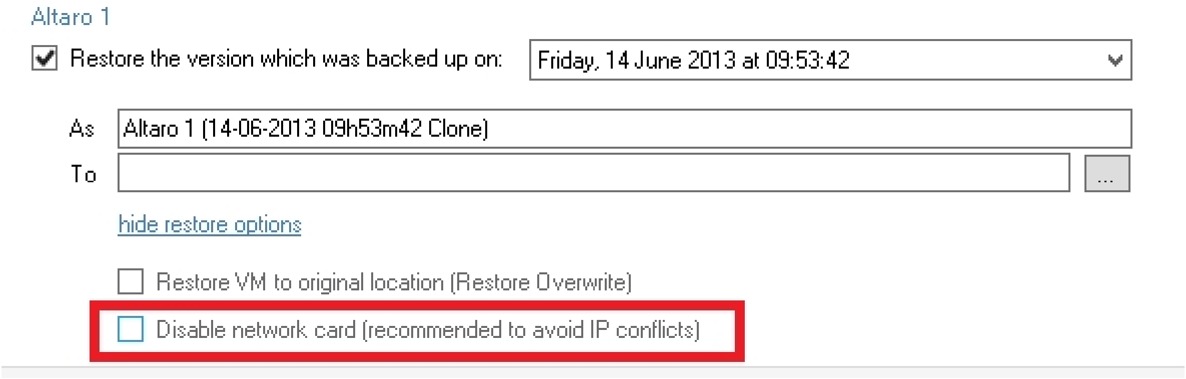


Altaro 1
☑ Restore the version which was backed up on: Friday, 14 June 2013 at 09:53:42

As: Altaro 1 (14-06-2013 09h53m42 Clone)

To:

show restore options



Altaro 1

☑ Restore the version which was backed up on: Friday, 14 June 2013 at 09:53:42

As Altaro 1 (14-06-2013 09h53m42 Clone)

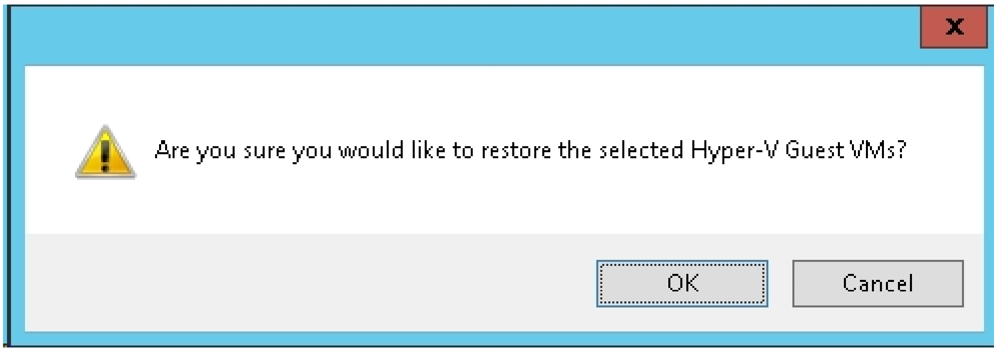
To

☐ Restore VM to original location (Restore Overwrite)

☐ Disable network card (recommended to avoid IP conflicts)

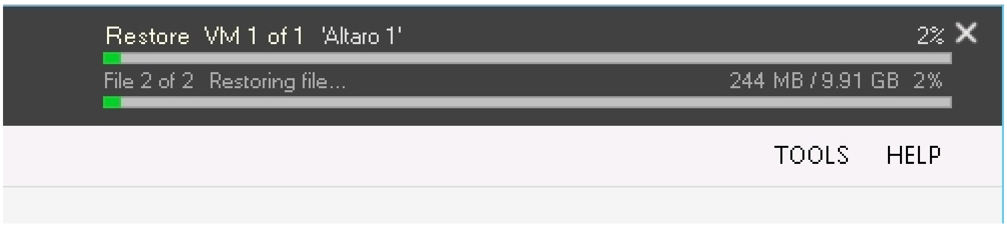
5. When ready, click on the **Restore Selected VMs** button to begin the restore operation.

6. You will be presented with a dialog to confirm the restore you have selected to start, to continue press OK.



Are you sure you would like to restore the selected Hyper-V Guest VMs?

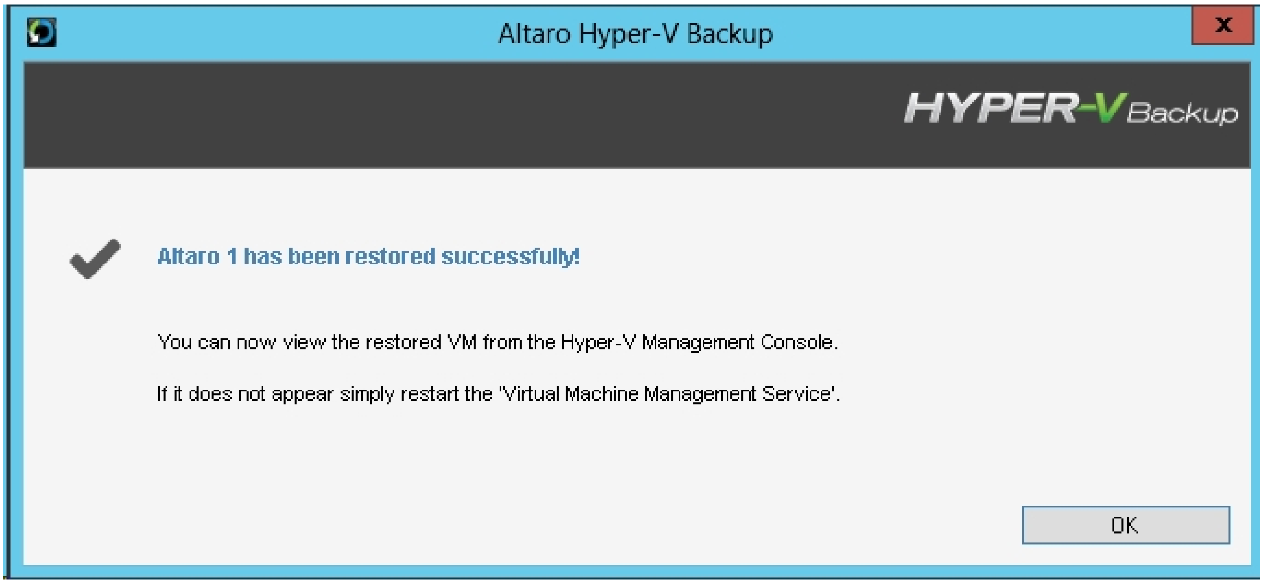
8. You will know that a restore is taking place because the progress bar at the top right of the Management Console will be active.



Restore VM 1 of 1 'Altaro 1' 2%

File 2 of 2 Restoring file... 244 MB / 9.91 GB 2%

9. Finally you will be notified that the restore is completed by a popup dialog, email and event log notifications if they are enabled.



Altaro 1 has been restored successfully!

You can now view the restored VM from the Hyper-V Management Console.

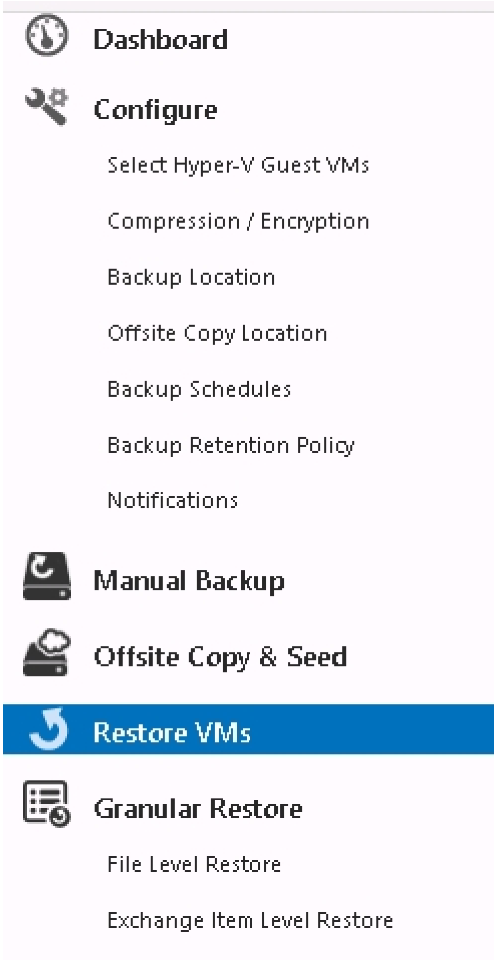
If it does not appear simply restart the 'Virtual Machine Management Service'.

Restore to different Hyper-V server

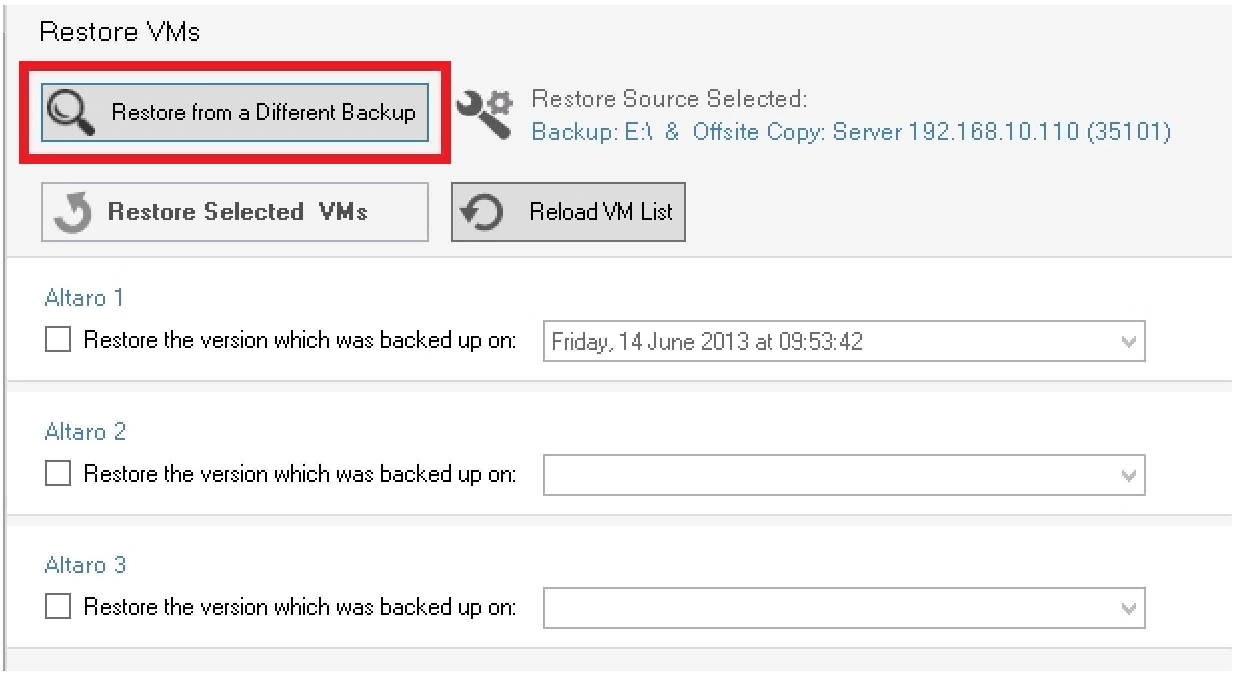
To import a backup from another Hyper-V guest and restore it please proceed as follows:

1. Open the **Management Console** as described here.

2. Navigate to the **Restore VMs** screen as shown below:



3. Click the "**Restore from a different backup**" button as shown below:



Restore VMs

Restore from a Different Backup

Restore Source Selected:
Backup: E:\ & Offsite Copy: Server 192.168.10.110 (35101)

Restore Selected VMs

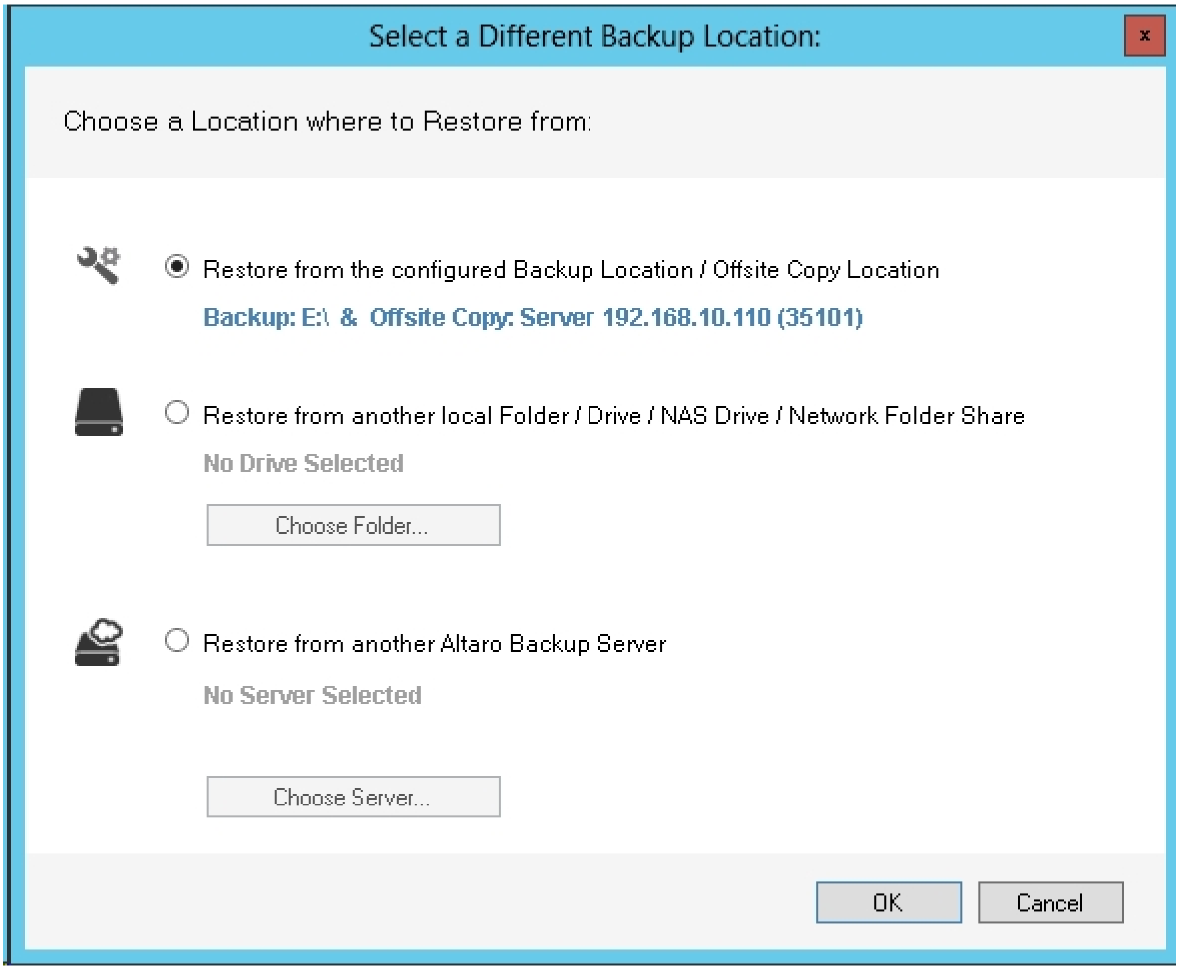
Reload VM List

Altaro 1
□ Restore the version which was backed up on: Friday, 14 June 2013 at 09:53:42

Altaro 2
□ Restore the version which was backed up on:

Altaro 3
□ Restore the version which was backed up on:

4. You will then be prompted to choose the backup location you wish to restore from:



Select a Different Backup Location:

Choose a Location where to Restore from:

● Restore from the configured Backup Location / Offsite Copy Location
Backup: E:\ & Offsite Copy: Server 192.168.10.110 (35101)

○ Restore from another local Folder / Drive / NAS Drive / Network Folder Share
No Drive Selected

Choose Folder...

○ Restore from another Altaro Backup Server
No Server Selected

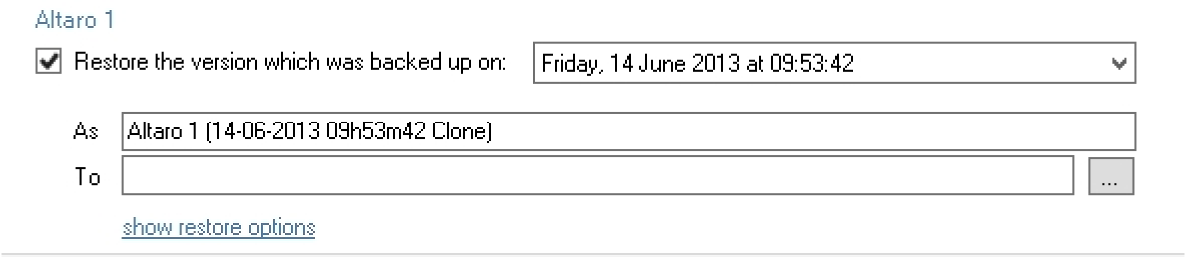
Choose Server...

OK Cancel

Choose the location and path to the backup folder you wish to restore from, then click OK.

The VM list will update to show a list of VMs which have been backed up within the selected backup folder.

5. Now tick the VM or VMs which you wish to restore to the current Host, choose the version of the VM you wish to restore from the drop down box, and choose the path you wish to restore to.



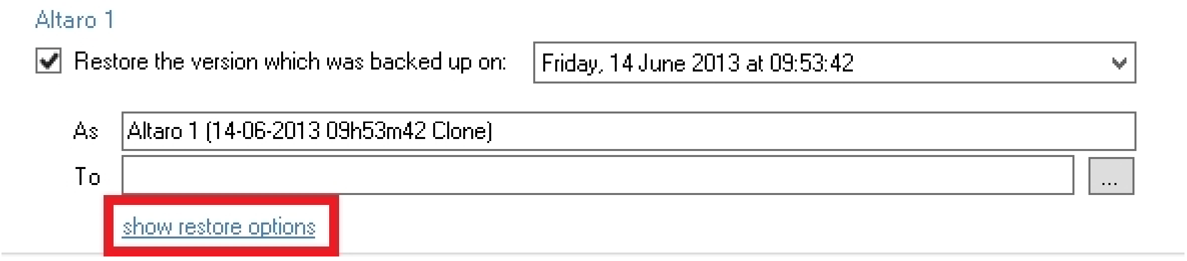
Altaro 1

☑ Restore the version which was backed up on: Friday, 14 June 2013 at 09:53:42

As: Altaro 1 (14-06-2013 09h53m42 Clone)

To:

By default the network card of the new cloned VM will be disabled so as to prevent IP Conflicts. You can choose not to disable the network card by first clicking the "show restore options" link as below, then unchecking the checkbox "Disabled Network Card".

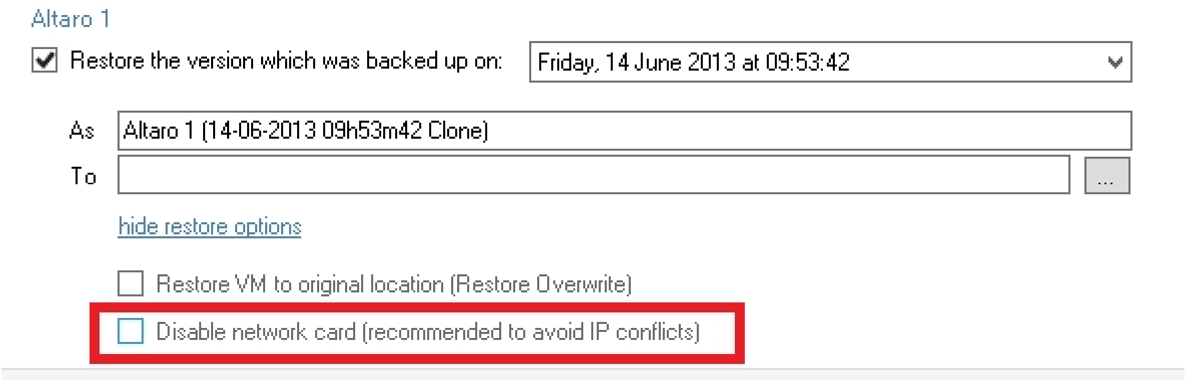


Altaro 1

☑ Restore the version which was backed up on: Friday, 14 June 2013 at 09:53:42

As: Altaro 1 (14-06-2013 09h53m42 Clone)

To:



Altaro 1

☑ Restore the version which was backed up on: Friday, 14 June 2013 at 09:53:42

As: Altaro 1 (14-06-2013 09h53m42 Clone)

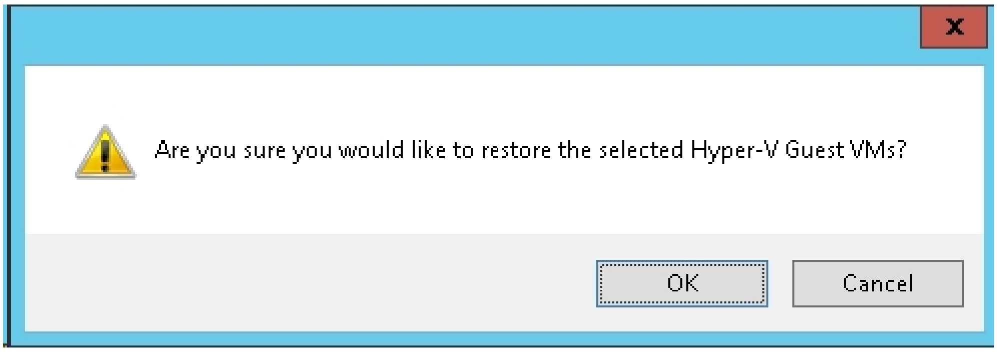
To:

□ Restore VM to original location (Restore Overwrite)

□ Disable network card (recommended to avoid IP conflicts)

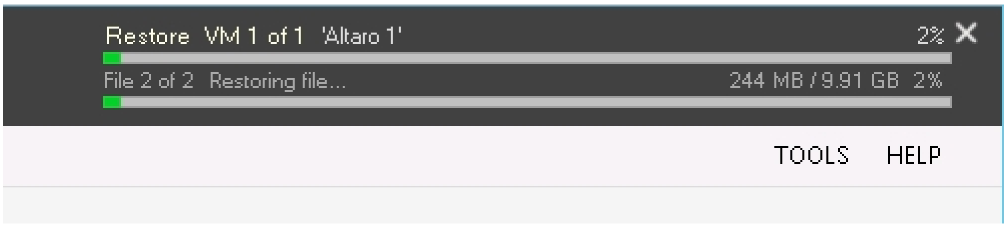
When ready, click on the **Restore Selected VMs** button to begin the restore operation.

6. You will be presented with a dialog to confirm the restore you have selected to start, to continue press OK.



Are you sure you would like to restore the selected Hyper-V Guest VMs?

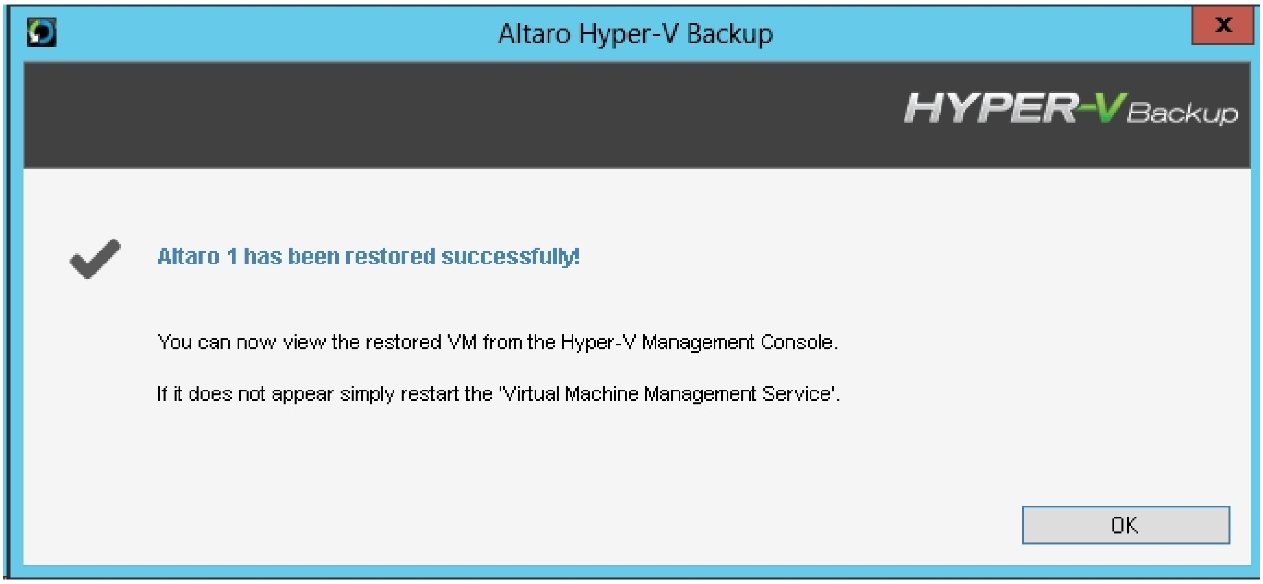
7. You will know that a restore is taking place because the progress bar at the top right of the Management Console will be active.



Restore VM 1 of 1 'Altaro 1' 2%

File 2 of 2 Restoring file... 244 MB / 9.91 GB 2%

8. Finally you will be notified that the restore is completed by a popup dialog, email and event log notifications if they are enabled.



Altaro 1 has been restored successfully!

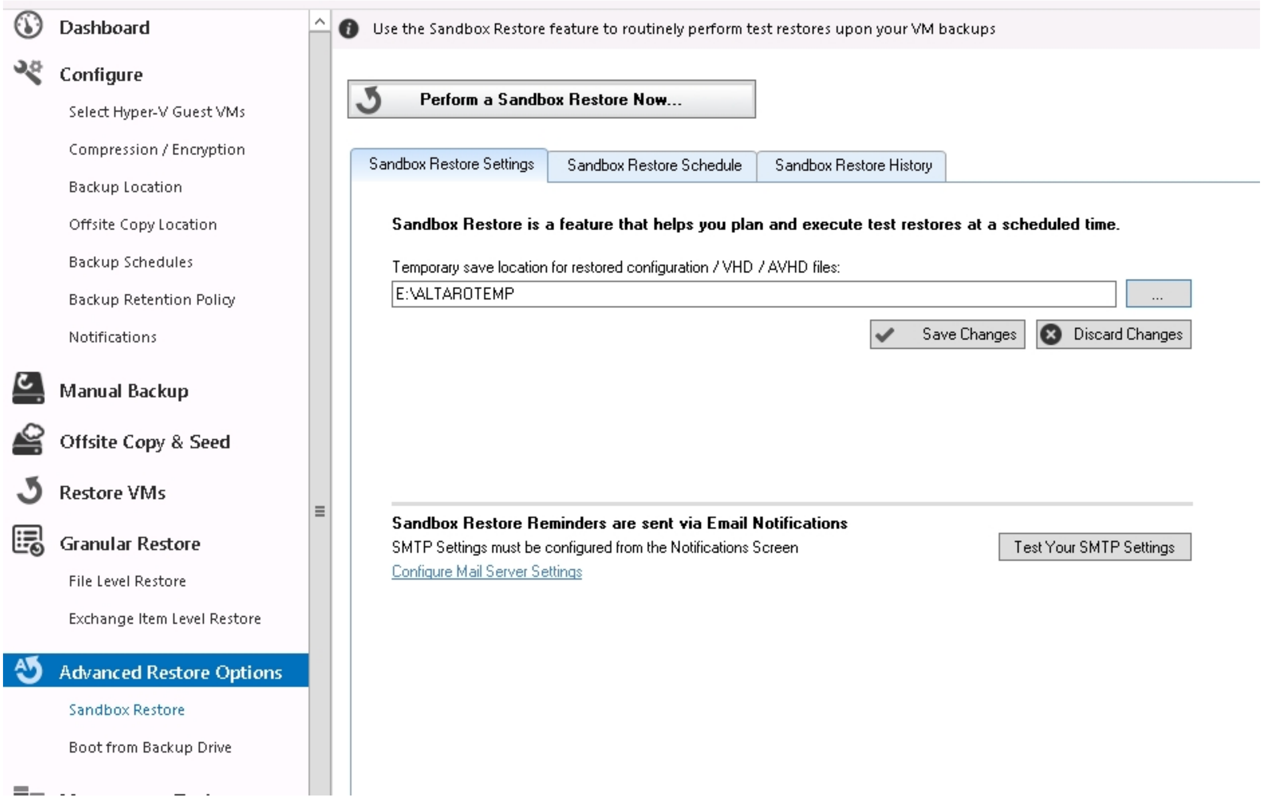
You can now view the restored VM from the Hyper-V Management Console.

If it does not appear simply restart the 'Virtual Machine Management Service'.

Sandbox Restore

The Sandbox Restore (previously known as the fire drill) feature allows you to plan and execute test restores at a scheduled time. That way you can easily verify that your VMs are being backed up correctly.

Before starting a Sandbox Restore please ensure that at least one successful backup has been taken for the VM in question.
To begin open the **Management Console** as described here and select the **Sandbox Restore** option under **Advanced Restore Options** on the left hand side menu.



Use the Sandbox Restore feature to routinely perform test restores upon your VM backups

Sandbox Restore is a feature that helps you plan and execute test restores at a scheduled time.

Temporary save location for restored configuration / VHD / AVHD files:

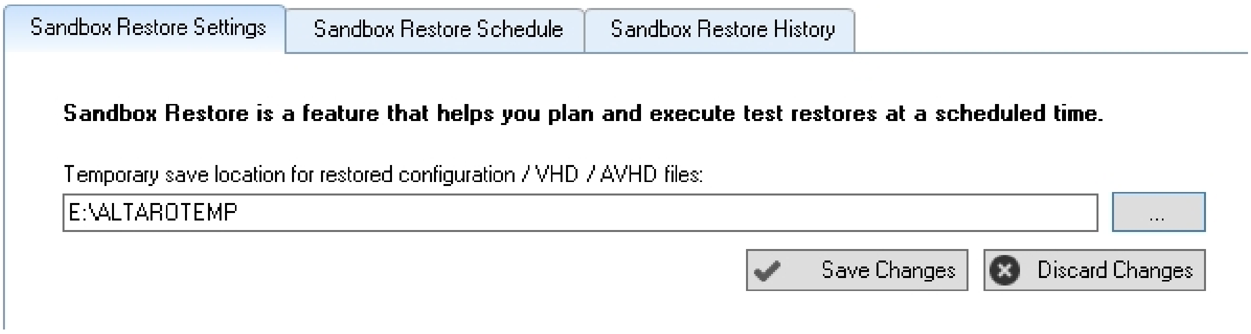
E:\ALTAROTEMP

Sandbox Restore Reminders are sent via Email Notifications

SMTP Settings must be configured from the Notifications Screen

Configuring Sandbox Restore Settings

Before performing a Sandbox Restore you must first specify a default location where to store temporary restored files. This location must have enough free space to hold any VMs which are temporarily restored to it.



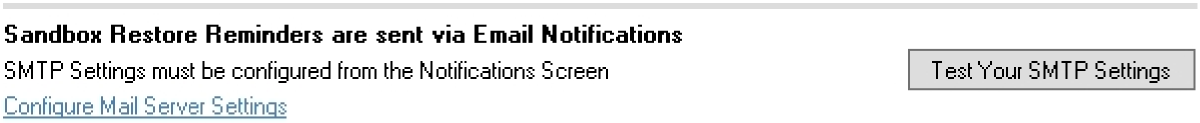
Sandbox Restore is a feature that helps you plan and execute test restores at a scheduled time.

Temporary save location for restored configuration / VHD / AVHD files:

E:\ALTAROTEMP

Should you which to receive Sandbox Restore reminders and notifications then it is important to configure your SMTP Settings as explained here. Sandbox Restore email notifications are sent for the following events:

- An automatic Sandbox Restore will begin in 1 hour.
- A reminder for a Sandbox Restore has been scheduled.
- A Sandbox Restore restore has completed.



Sandbox Restore Reminders are sent via Email Notifications

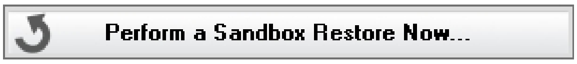
SMTP Settings must be configured from the Notifications Screen

Configure Mail Server Settings

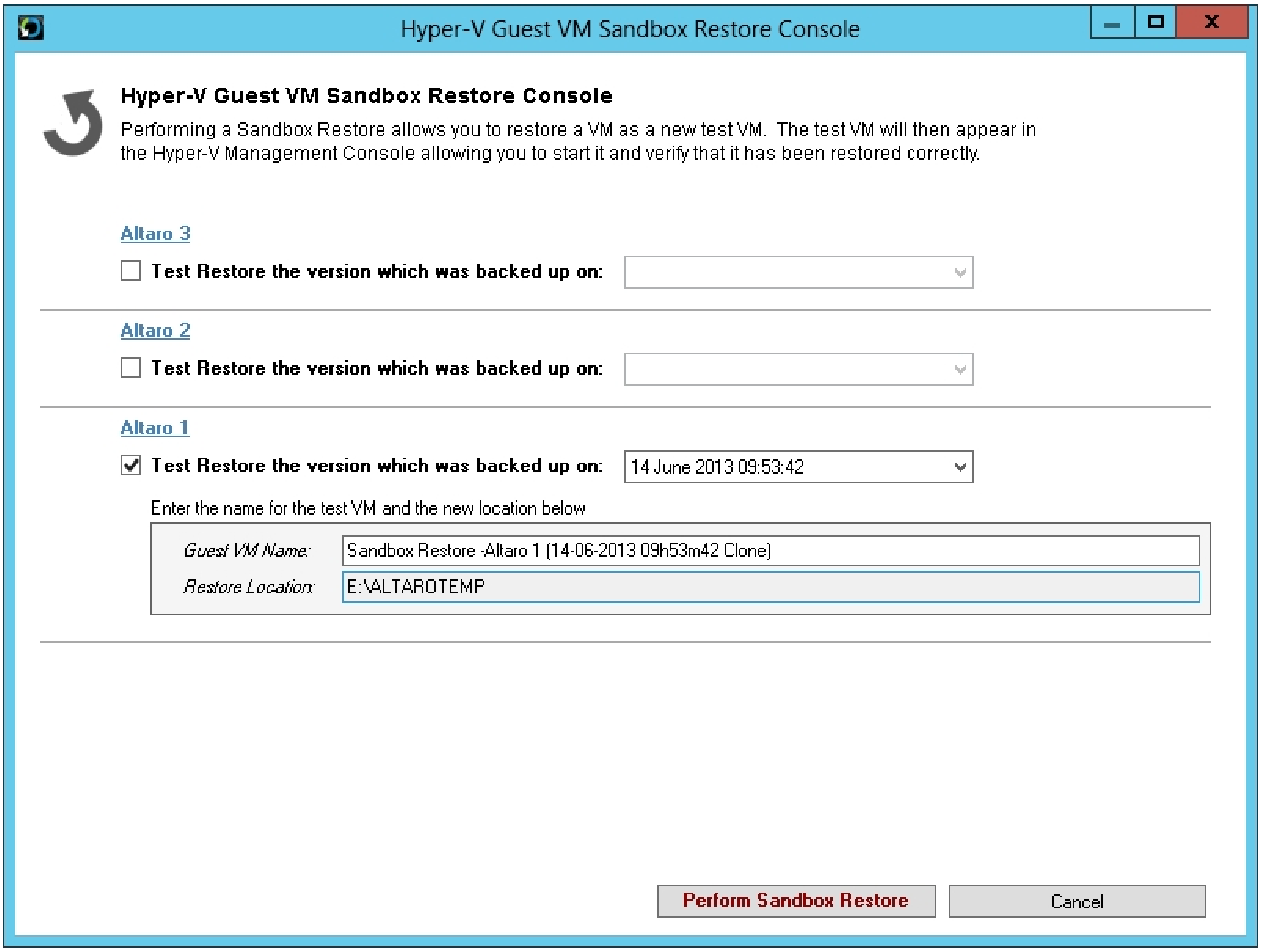
Performing a manual Sandbox Restore

By performing a manual Sandbox Restore you will perform a test restore on one or more VMs. These VMs will be restored as clones to a new location and will be attached to Hyper-V. The names of the test VMs will contain the text "Sandbox Restore" and a timestamp of the backup version restored.

1. To perform a manual Sandbox Restore simply click on the button "**Perform a Sandbox Restore Now**".



2. Select which VM backups and which backup versions you would like to include in the Sandbox.



Hyper-V Guest VM Sandbox Restore Console

Hyper-V Guest VM Sandbox Restore Console

Performing a Sandbox Restore allows you to restore a VM as a new test VM. The test VM will then appear in the Hyper-V Management Console allowing you to start it and verify that it has been restored correctly.

Altaro 3

□ **Test Restore the version which was backed up on:**

Altaro 2

□ **Test Restore the version which was backed up on:**

Altaro 1

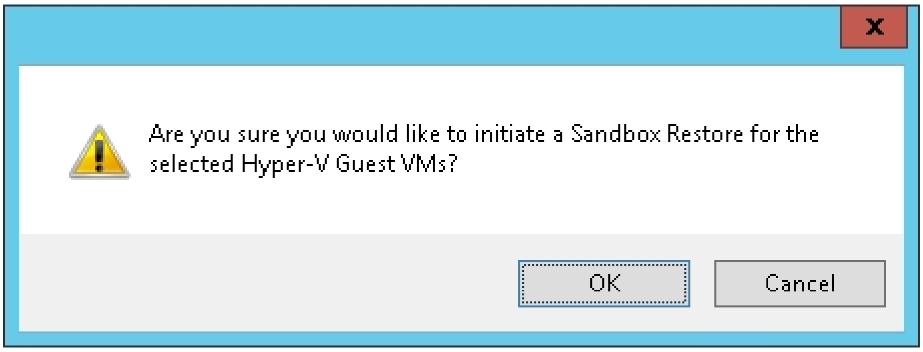
☑ **Test Restore the version which was backed up on:** 14 June 2013 09:53:42

Enter the name for the test VM and the new location below

Guest VM Name: Sandbox Restore -Altaro 1 (14-06-2013 09h53m42 Clone)

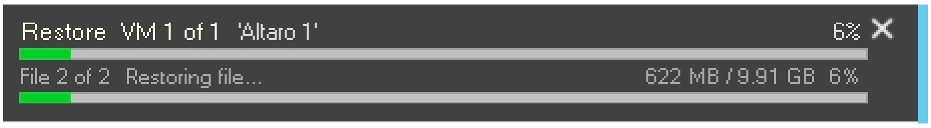
Restore Location: E:\ALTAROTEMP

3. Click on "**Perform Sandbox Restore**".



Are you sure you would like to initiate a Sandbox Restore for the selected Hyper-V Guest VMs?

4. Confirm that you would like to proceed and you will see that the Sandbox restore has begun from the top right progress bar.



Restore VM 1 of 1 'Altaro 1' 6%

File 2 of 2 Restoring file... 622 MB / 9.91 GB 6%

5. Once the restore has completed then you will be notified on whether it was successful or not. If it was

successful you will find that the new test VM has been attached to Hyper-V and can be used to verify that it has been restored correctly.

Please note that to avoid conflicts the Network Card is disabled for VMs which are restored using Sandbox Restore

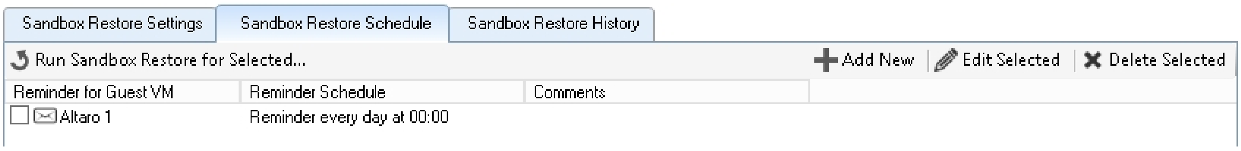
Configuring automatic scheduled Sanbox Restores / Reminders

A great feature of Sandbox Restore is that users are able to schedule routine Sandbox Restore operations or reminders.

Scheduled Sandbox Restore Operation
At the scheduled time the VM in question will be restored as a clone and attached to Hyper-V. One hour before the sandbox restore begins, users will receive an email notification followed by a second email once the restore is completed. *(Emails will only be received if the Mail Notifications are configured correctly.)*

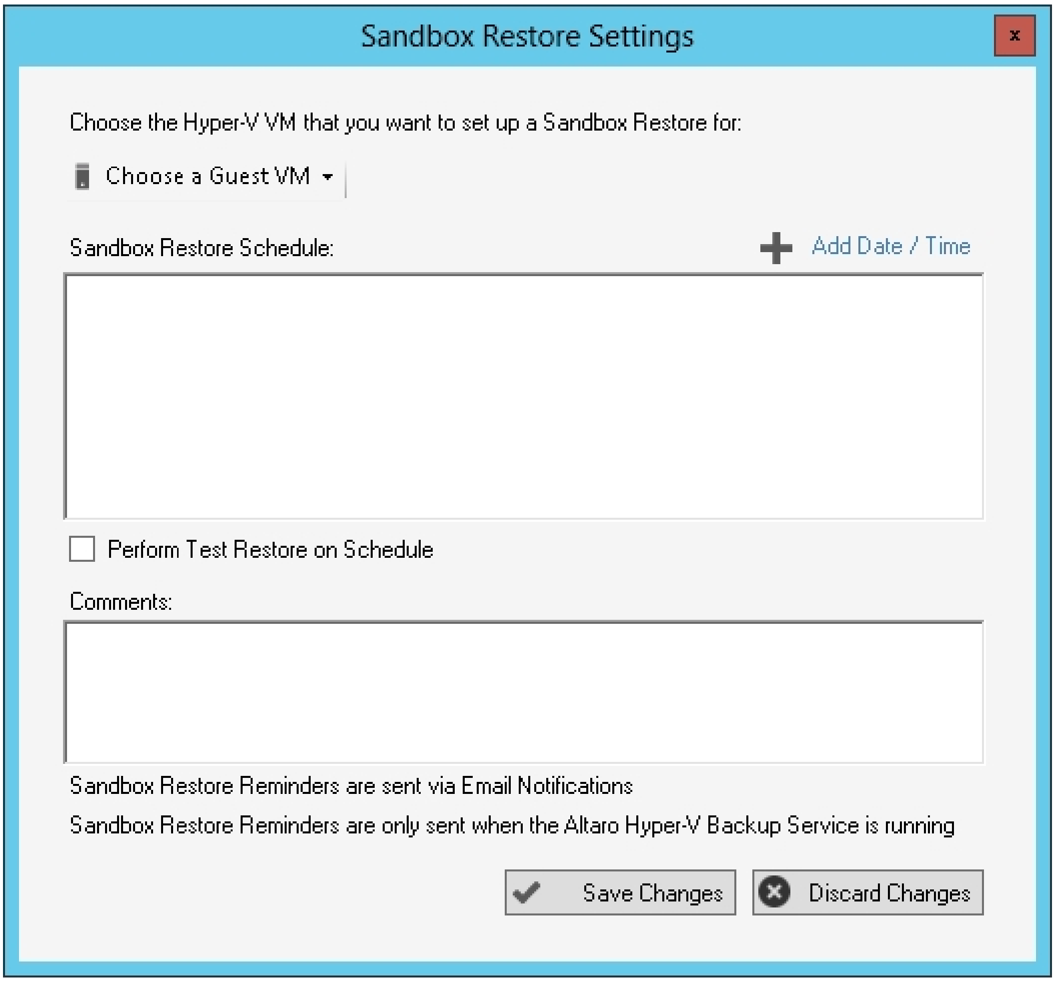
Scheduled Sandbox Restore Email Reminders
In this case at the scheduled time - instead of restoring the VM - a simple email reminder will be sent to remind the user to perform a Sandbox restore. *(Emails will only be received if the Mail Notifications are configured correctly.)*

To configure schedule restores / reminders you must use the "Sandbox Restore Schedule" Tab.



Reminder for Guest VM	Reminder Schedule	Comments
□ Altaro 1	Reminder every day at 00:00	

1. To add a new Sandbox Restore schedule simply click on the "Add New" toolstrip button. Any you will be presented with the following dialog.


Sandbox Restore Settings

Choose the Hyper-V VM that you want to set up a Sandbox Restore for:

Sandbox Restore Schedule:

□ Perform Test Restore on Schedule

Comments:

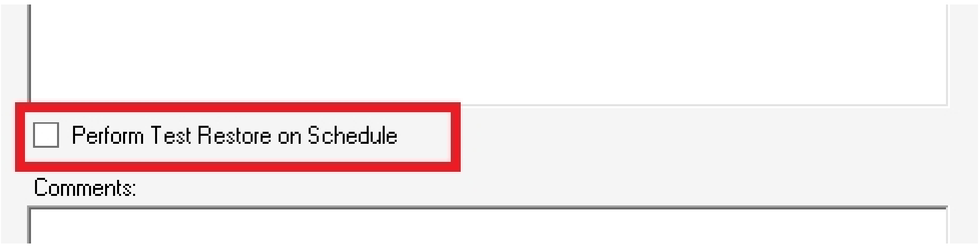
Sandbox Restore Reminders are sent via Email Notifications

Sandbox Restore Reminders are only sent when the Altaro Hyper-V Backup Service is running

2. Select a VM upon which you wish to schedule a Sandbox restore or Reminder. This can be done by clicking on "Choose a Guest VM".

3. Add a number of date / time rows to the Sandbox Restore Schedule panel. You can choose a combination of schedules such as "Mondays at 6pm and Saturdays at 10am and 10pm".

4. Choose whether you would like a Sandbox Restore to begin automatically. This can be done by checking or unchecking the "**Perform Test Restore on Schedule**". If you leave this option unchecked then you will simply receive an email reminder. *Please note that to avoid conflicts the Network Card is disabled for VMs which are restored using Sandbox Restore.*

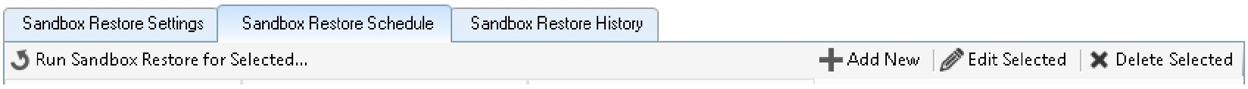

□ Perform Test Restore on Schedule

Comments:

5. You may also add some comments to document the Sandbox Restore schedule.

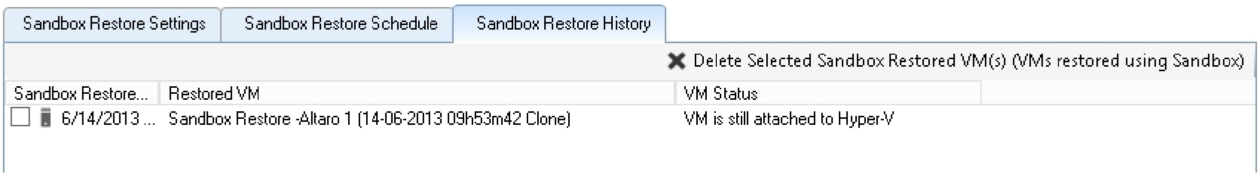
6. Finally click "Save Changes" and your new Sandbox Restore schedule will be enabled.

If you wish to edit or delete existing Sandbox Restore schedules simply use the toolstrip buttons at the top *of the tab.*



Sandbox Restore History / Deleting Temporary Restored VMs

Finally the "Sandbox Restore History" tab will provide users with a history of any Sandbox restores which have been performed.



Sandbox Restore...	Restored VM	VM Status
□ 6/14/2013 ...	Sandbox Restore -Altaro 1 (14-06-2013 09h53m42 Clone)	VM is still attached to Hyper-V

Each time a Sandbox restore is performed an entry is made in the Sandbox Restore History list. A status column also indicates whether the restored VM is still attached to Hyper-V.

Should you wish to delete any temporarily restored VMs simply select them from the list and click on "Delete Selected Sandbox Restored VM(s)". At this point they will be detached from Hyper-V and deleted from the temporary restore location.

Once deleted the entry will still appear in the History list, but the status column will indicate that the VM has been deleted from Hyper-V.

File Level Restore

The File Level Restore feature allows you to explore the contents of the VHD / AVHD files of a VM backup. That way you can easily restore specific files and folders from a VM backup without having to restore and attach the entire VM.

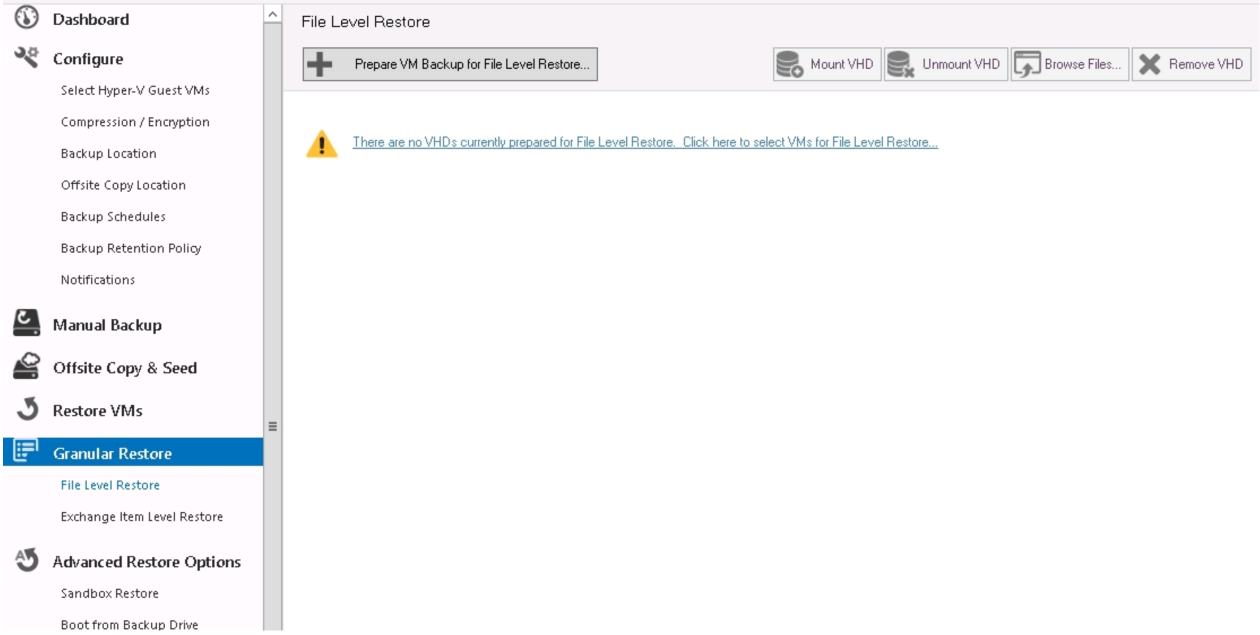
Please note that:

- if you wish to perform a File Level Restore for a VM which contains AVHD snapshots then you will need to follow an alternative procedure.

- if you wish to perform a File Level Restore an older backup version of a VM then you will need to follow an alternative procedure.

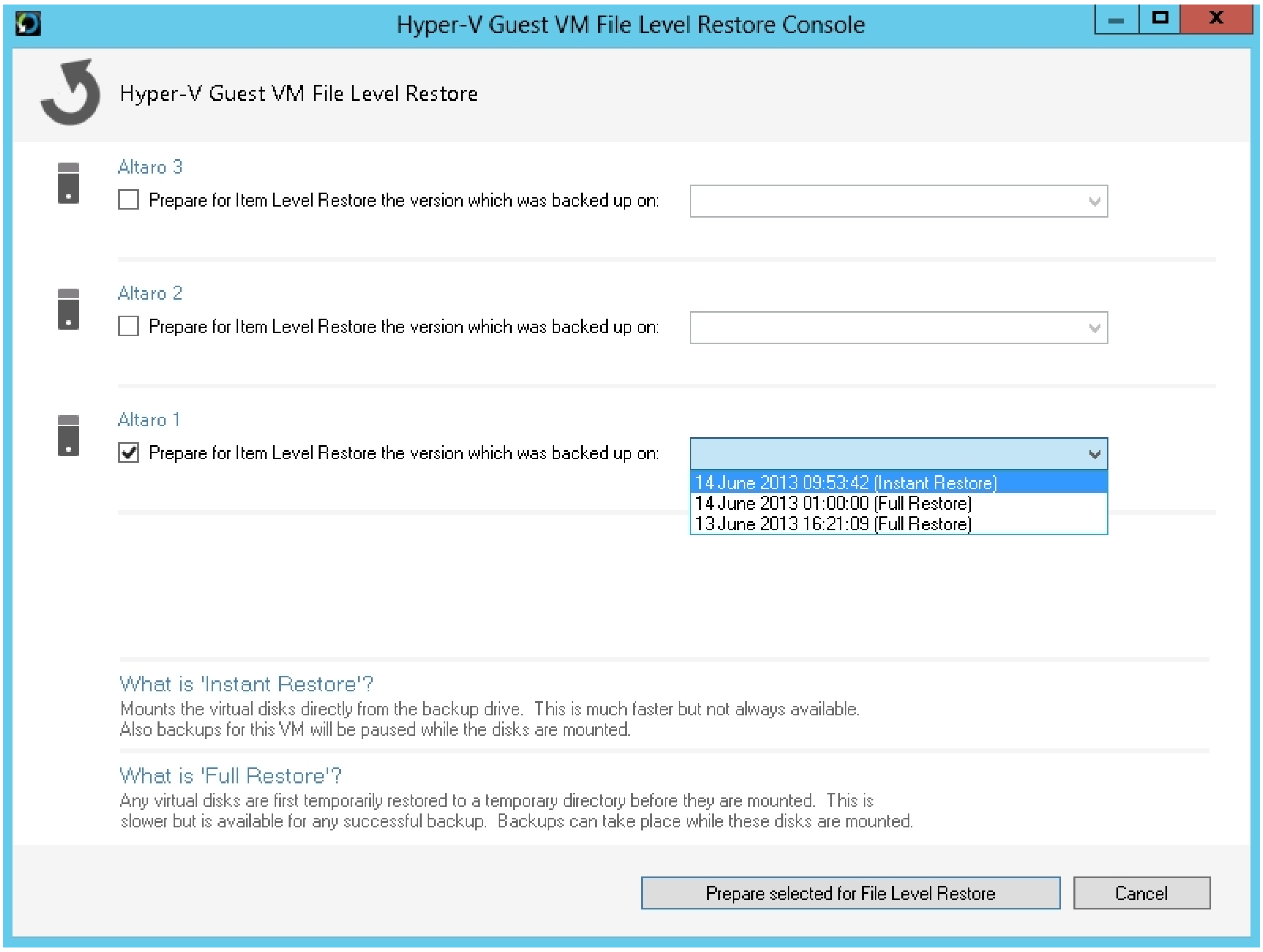
Before starting a File Level Restore please ensure that at least one successful backup has been taken for the VM in question.

1. Open the **Management Console** as described here and select the **File Level Restore** option under **Granular Restore** from the left hand side menu.



There are no VHDs currently prepared for File Level Restore. Click here to select VMs for File Level Restore...

2. Click on "Prepare VM Backp for File Level Restore..." to begin. You will then be presented with a list of VM Backups available for File Level Restore.
Select the VM you wish to restore and choose the backup version required from the drop down list.


Hyper-V Guest VM File Level Restore Console
Hyper-V Guest VM File Level Restore
Prepare selected for File Level Restore
Cancel

Altaro 3
□ Prepare for Item Level Restore the version which was backed up on:

Altaro 2
□ Prepare for Item Level Restore the version which was backed up on:

Altaro 1
☑ Prepare for Item Level Restore the version which was backed up on:
14 June 2013 09:53:42 (Instant Restore)
14 June 2013 01:00:00 (Full Restore)
13 June 2013 16:21:09 (Full Restore)

What is 'Instant Restore'?
Mounts the virtual disks directly from the backup drive. This is much faster but not always available. Also backups for this VM will be paused while the disks are mounted.

What is 'Full Restore'?
Any virtual disks are first temporarily restored to a temporary directory before they are mounted. This is slower but is available for any successful backup. Backups can take place while these disks are mounted.

You will see that in brackets next to the backup version, some restores are **Instant** and some are **Full**.

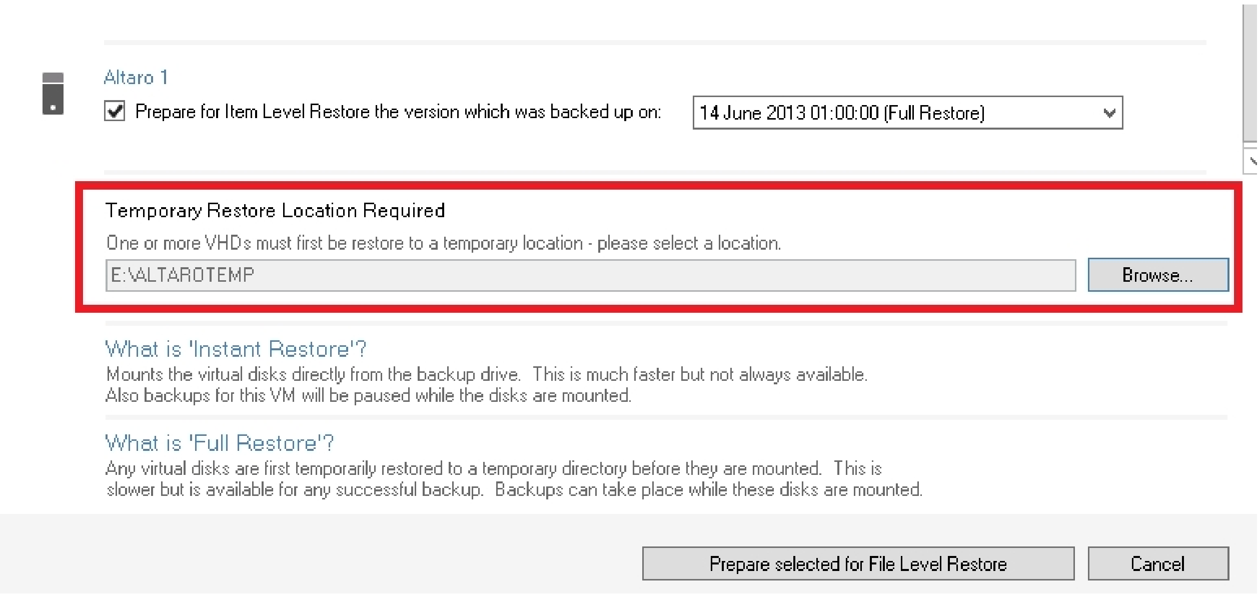
Instant Restores will mount the backup directly from the backup drive, this is only available for your most recent backup

Full Restores will copy the necessary backup files to a temporary location and mount the restored version from the temporary folder.

Note: Backups of VMs which contain snapshots (or checkpoints) will always be Full Restores, even if they are your most recent version.

If you select a Full Restore version. you must configure a temporary restore location as shown below.

The temporary restore location will contain any temporarily restored VHD / AVHD files. These can then be deleted automatically once you are done from the File Level Restore.



Altaro 1

☑ Prepare for Item Level Restore the version which was backed up on: 14 June 2013 01:00:00 (Full Restore)

Temporary Restore Location Required

One or more VHDs must first be restore to a temporary location - please select a location.

E:\ALTAROTEMP

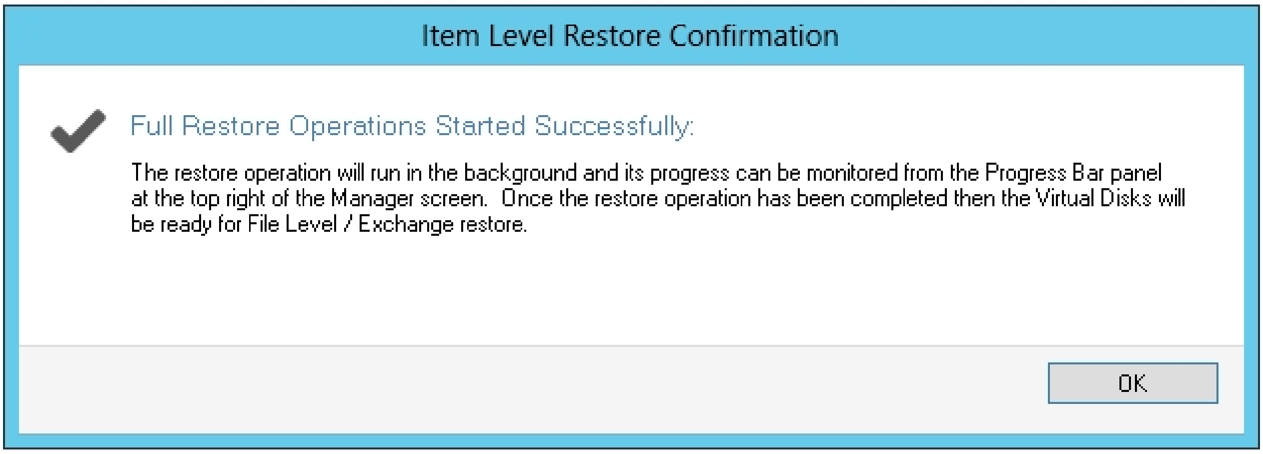
What is 'Instant Restore'?

Mounts the virtual disks directly from the backup drive. This is much faster but not always available. Also backups for this VM will be paused while the disks are mounted.

What is 'Full Restore'?

Any virtual disks are first temporarily restored to a temporary directory before they are mounted. This is slower but is available for any successful backup. Backups can take place while these disks are mounted.

When done, click "**Prepare selected for File level Restore**"
You will be notified of the successful start of the operation as below:

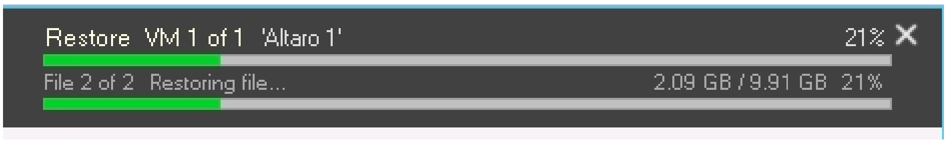


Item Level Restore Confirmation

Full Restore Operations Started Successfully:

The restore operation will run in the background and its progress can be monitored from the Progress Bar panel at the top right of the Manager screen. Once the restore operation has been completed then the Virtual Disks will be ready for File Level / Exchange restore.

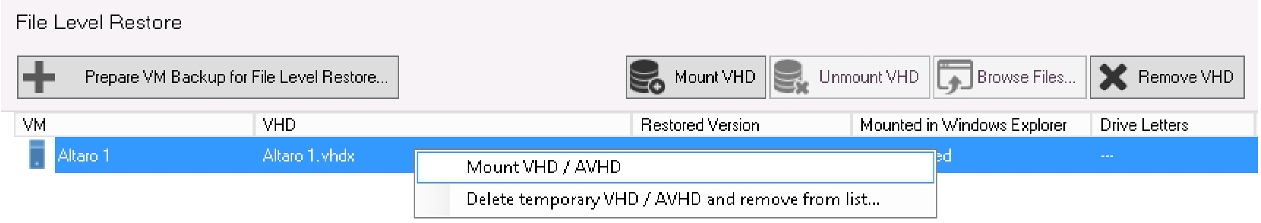
5. Once you confirm the above step you will see a progress bar:



Restore VM 1 of 1 'Altaro 1' 21%

File 2 of 2 Restoring file... 2.09 GB / 9.91 GB 21%

Assuming that all is successful the relevent VM(s) will be shown in the File Level Restore screen where you can right click and mount the VHD/AVHD as shown below:


File Level Restore
Prepare VM Backup for File Level Restore...
Mount VHD
Unmount VHD
Browse Files...
Remove VHD
Mount VHD / AVHD
Delete temporary VHD / AVHD and remove from list...

VM	VHD	Restored Version	Mounted in Windows Explorer	Drive Letters
Altaro 1	Altaro 1.vhdx		ed	---

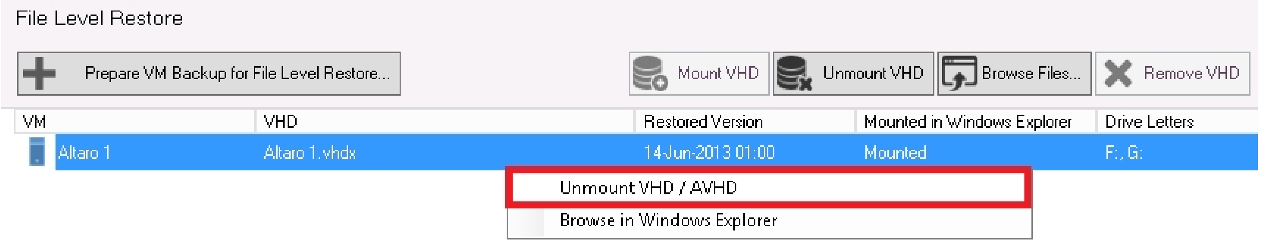
A Windows Explorer window will appear for each drive letter once you have mounted the VHD/ AVHDs.

Note: It is possible that a drive letter is not automatically assigned by Windows when the disks are mounted. If this happens then you must use the **Disk Management** utility in the Windows **Server Manager** console to assign drive letters.

Once done, you can then manually browse the mounted disks using **My Computer**.

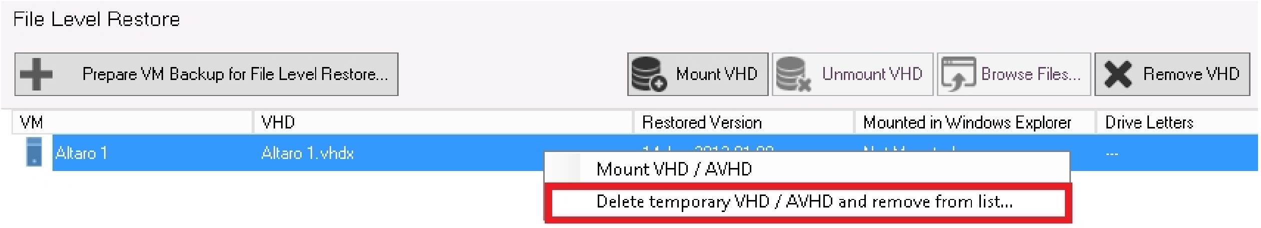
6. Finally after having restored all the required files, you can unmount and the delete the temporary files.

To unmount, right click the VM and choose Unmount VHD/AVHD as below:



VM	VHD	Restored Version	Mounted in Windows Explorer	Drive Letters
Altaro 1	Altaro 1.vhdx	14-Jun-2013 01:00	Mounted	F:, G:

Then to delete the temporary files, right click again and choose **Delete temporary VHD/AVHD and remove from list**


File Level Restore
Prepare VM Backup for File Level Restore...
Mount VHD
Unmount VHD
Browse Files...
Remove VHD
Mount VHD / AVHD
Delete temporary VHD / AVHD and remove from list...

VM	VHD	Restored Version	Mounted in Windows Explorer	Drive Letters
Altaro 1	Altaro 1.vhdx			---

Important:

- Backups will be disabled for any VM which currently has one or more VHDs mounted. To resume backups for this VM then simply unmount the VHDs from the File Level Restore screen.

Exchange Item Level Restore

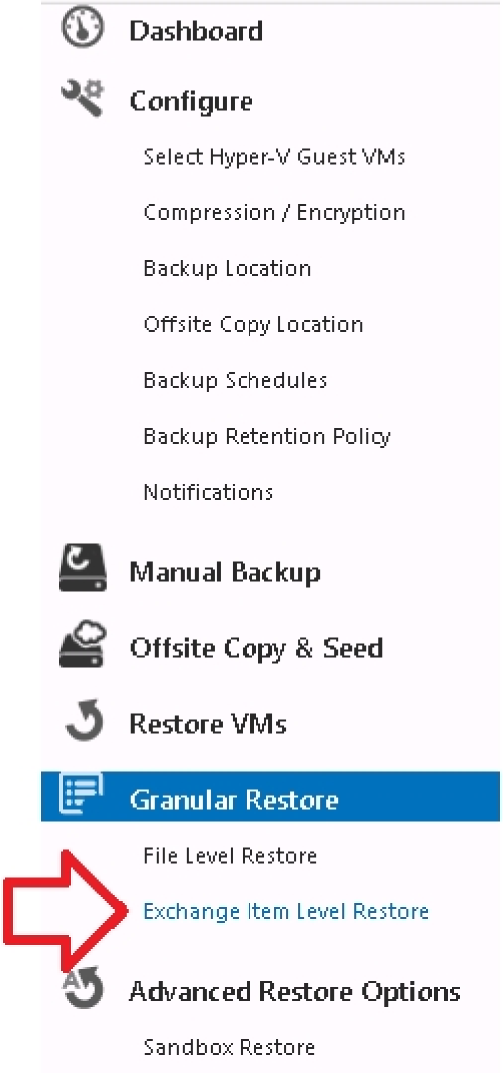
The Exchange Item Level Restore feature allows you to granularly explore and restore individual items from your Exchange Databases inside a backed up VM.

Note: Altaro Hyper-V Backup supports Exchange Item Level Restores from databases from ***Exchange 2007 and later.***

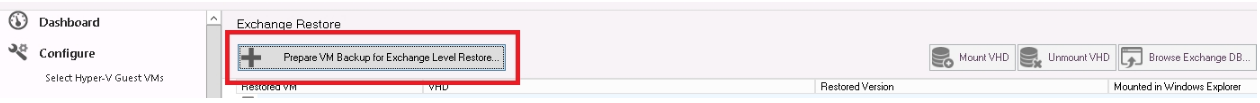
Before starting an Exchange Item Level Restore please ensure that at least one successful backup has been taken for the VM in question.

To proceed with the Exchange Item level restore, please follow the instructions below:

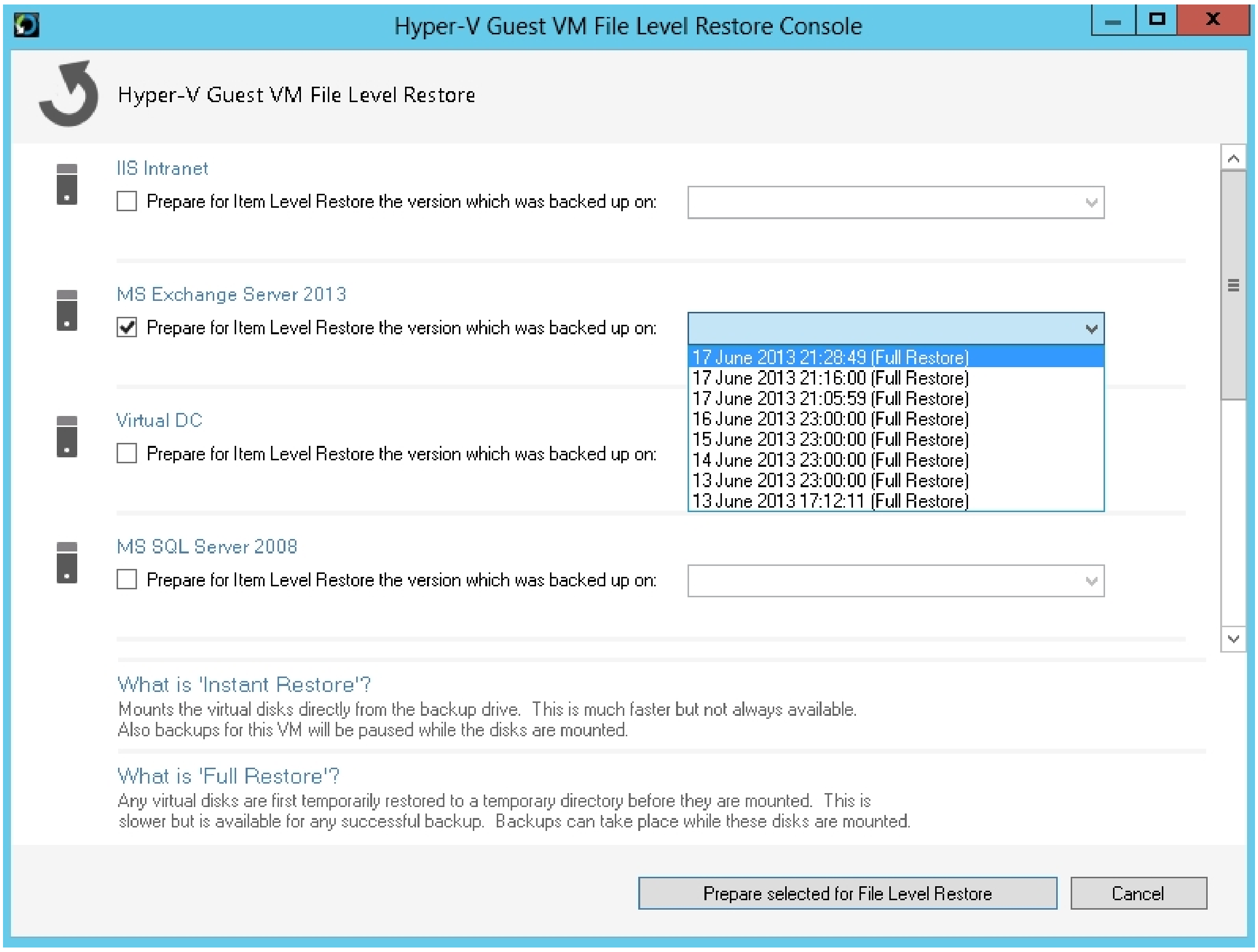
1. From the Management console, go to **Granular Restore** >> **Exchange Item Level Restore**



2. In the console on the right, click the "**Prepare VM Backup for Exchange...**" button



3. You will then be prompted to select your Exchange Server VM and the version which you wish to restore from as below:



Hyper-V Guest VM File Level Restore Console

Hyper-V Guest VM File Level Restore

IIS Intranet

□ Prepare for Item Level Restore the version which was backed up on:

MS Exchange Server 2013

☑ Prepare for Item Level Restore the version which was backed up on:

- 17 June 2013 21:28:49 (Full Restore)
- 17 June 2013 21:16:00 (Full Restore)
- 17 June 2013 21:05:59 (Full Restore)
- 16 June 2013 23:00:00 (Full Restore)
- 15 June 2013 23:00:00 (Full Restore)
- 14 June 2013 23:00:00 (Full Restore)
- 13 June 2013 23:00:00 (Full Restore)
- 13 June 2013 17:12:11 (Full Restore)

Virtual DC

□ Prepare for Item Level Restore the version which was backed up on:

MS SQL Server 2008

□ Prepare for Item Level Restore the version which was backed up on:

What is 'Instant Restore'?

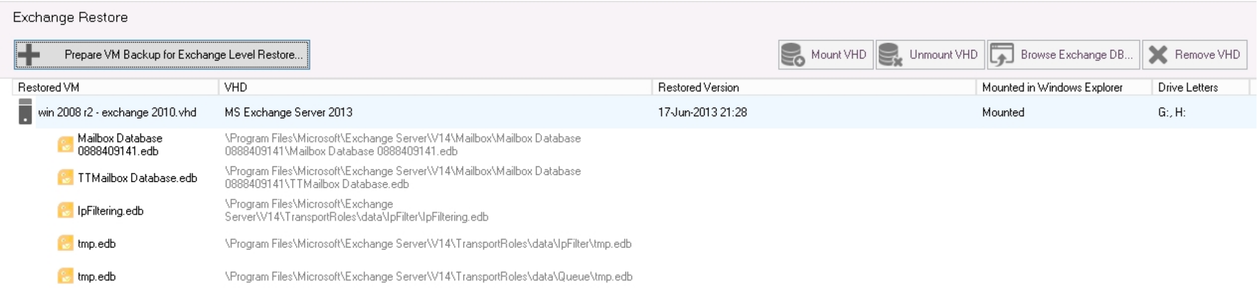
Mounts the virtual disks directly from the backup drive. This is much faster but not always available. Also backups for this VM will be paused while the disks are mounted.

What is 'Full Restore'?

Any virtual disks are first temporarily restored to a temporary directory before they are mounted. This is slower but is available for any successful backup. Backups can take place while these disks are mounted.

4. After choosing the VM and version from the drop-down list, click **Prepare selected for Exchange Item Level Restore**

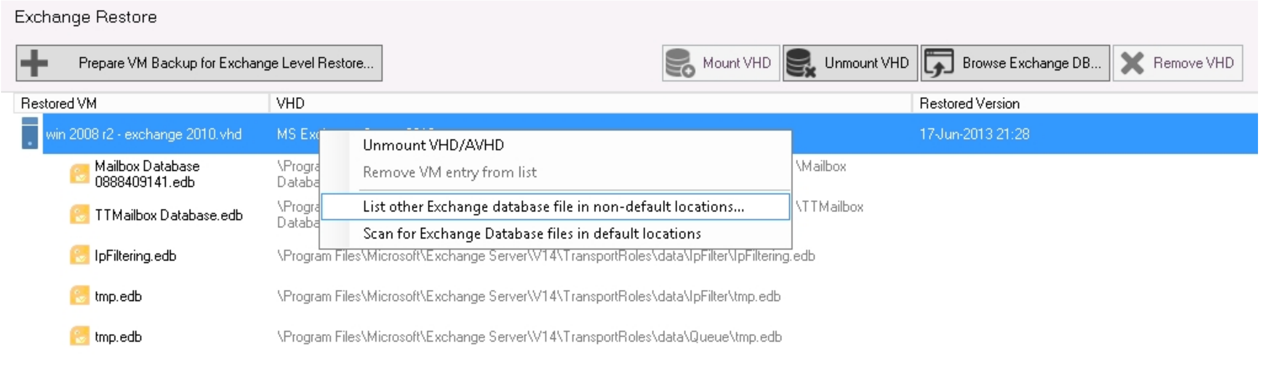
5. If the Exchange databases on the VM you selected and restored are in the default Microsoft Exchange location, then they will be automatically added to the Exchange Restore console as shown below:



Exchange Restore

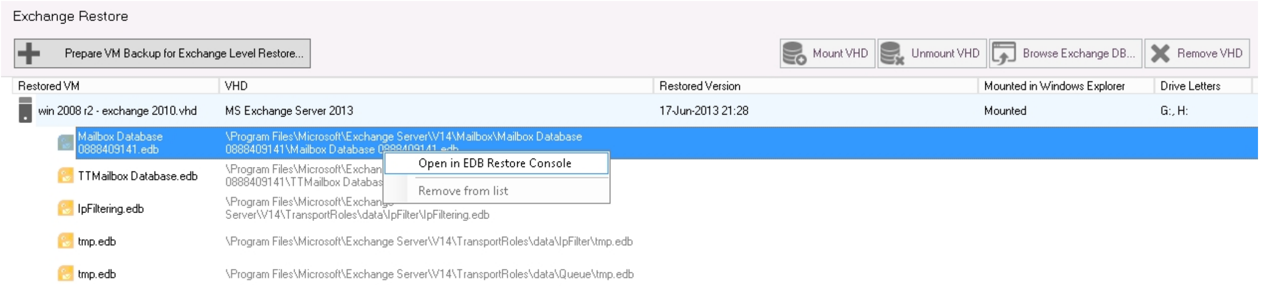
Restored VM	VHD	Restored Version	Mounted in Windows Explorer	Drive Letters
win 2008 r2 - exchange 2010.vhd	MS Exchange Server 2013	17-Jun-2013 21:28	Mounted	G:, H:
Mailbox Database 0888409141.edb	\Program Files\Microsoft\Exchange Server\V14\Mailbox\Mailbox Database 0888409141\Mailbox Database 0888409141.edb			
TTMailbox Database.edb	\Program Files\Microsoft\Exchange Server\V14\Mailbox\Mailbox Database 0888409141\TTMailbox Database.edb			
IpFiltering.edb	\Program Files\Microsoft\Exchange Server\V14\TransportRoles\data\IpFilter\IpFiltering.edb			
tmp.edb	\Program Files\Microsoft\Exchange Server\V14\TransportRoles\data\IpFilter\tmp.edb			
tmp.edb	\Program Files\Microsoft\Exchange Server\V14\TransportRoles\data\Queue\tmp.edb			

6. If there are Exchange databases in non-default locations, then you will need to add them manually by right-clicking the VM and choosing "**List other Exchange database files in non-default locations**" as shown below:


Exchange Restore
Prepare VM Backup for Exchange Level Restore...
Mount VHD
Unmount VHD
Browse Exchange DB...
Remove VHD
Unmount VHD/AVHD
Remove VM entry from list
List other Exchange database file in non-default locations...
Scan for Exchange Database files in default locations

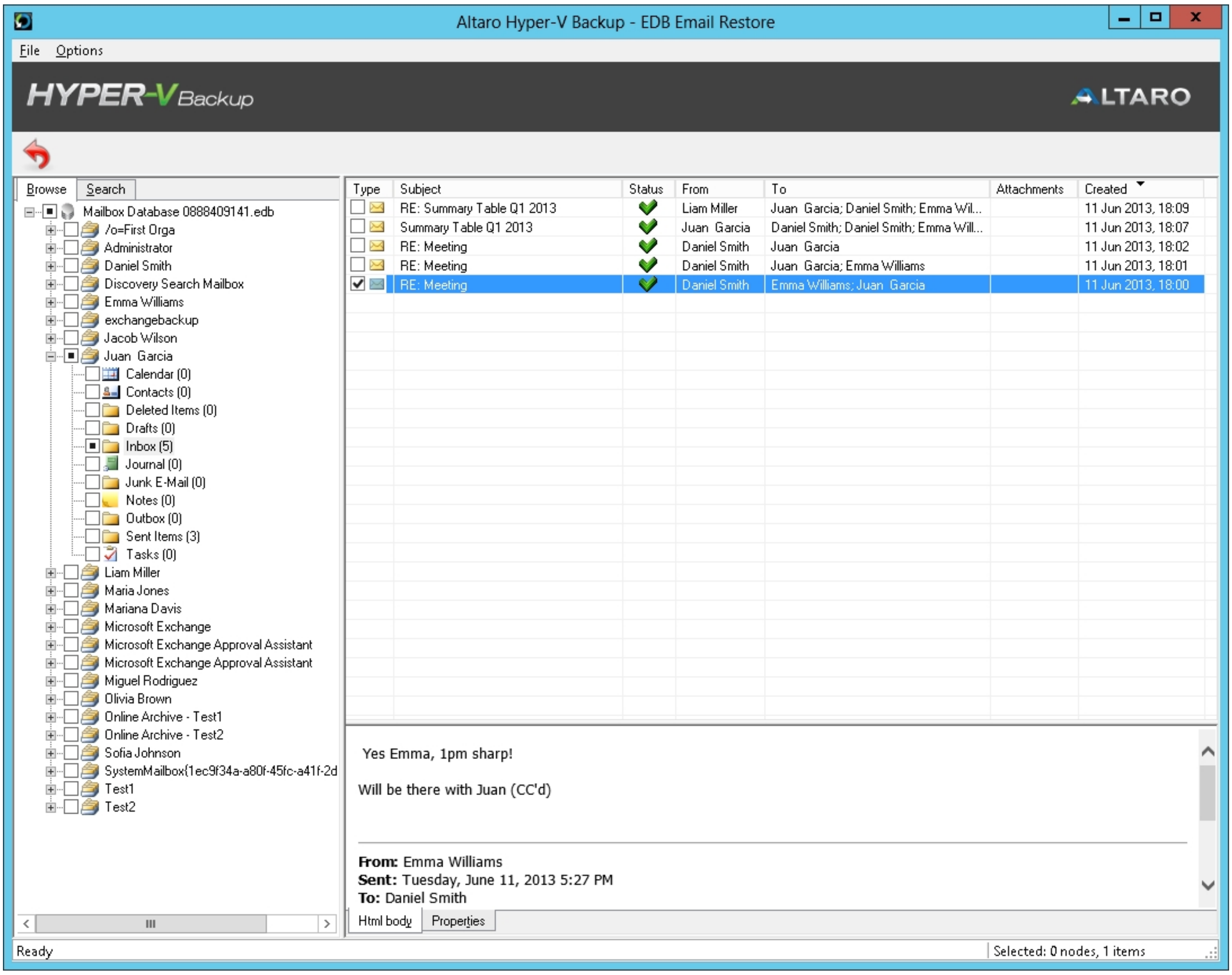
Restored VM	VHD	Restored Version
win 2008 r2 - exchange 2010.vhd	MS Exc	17-Jun-2013 21:28
Mailbox Database 0888409141.edb	\Progra Databa \Mailbox	
TTMailbox Database.edb	\Progra Databa \TTMailbox	
IpFiltering.edb	\Program Files\Microsoft\Exchange Server\V14\TransportRoles\data\IpFilter\IpFiltering.edb	
tmp.edb	\Program Files\Microsoft\Exchange Server\V14\TransportRoles\data\IpFilter\tmp.edb	
tmp.edb	\Program Files\Microsoft\Exchange Server\V14\TransportRoles\data\Queue\tmp.edb	

7. Once your desired database files have been added to the console, right-click the database you wish to restore from and choose "**Open in EDB Restore console**" as below:



Restored VM	VHD	Restored Version	Mounted in Windows Explorer	Drive Letters
win 2008 r2 - exchange 2010.vhd	MS Exchange Server 2013	17-Jun-2013 21:28	Mounted	G:, H:
Mailbox Database 0888409141.edb	\Program Files\Microsoft\Exchange Server\V14\Mailbox\Mailbox Database 0888409141\Mailbox Database 0888409141.edb			
TTMailbox Database.edb	\Program Files\Microsoft\Exchan 0888409141\TTMailbox Databas			
IpFiltering.edb	\Program Files\Microsoft\Exchang Server\V14\TransportRoles\data\IpFilter\IpFiltering.edb			
tmp.edb	\Program Files\Microsoft\Exchange Server\V14\TransportRoles\data\IpFilter\tmp.edb			
tmp.edb	\Program Files\Microsoft\Exchange Server\V14\TransportRoles\data\Queue\tmp.edb			

8. Once the EDB Restore Console is launched, simply locate the items you wish to restore and mark them using the checkbox to the left as below:



Altaro Hyper-V Backup - EDB Email Restore

File Options

HYPER-V Backup ALTARO

Browse | Search

- Mailbox Database 0888409141.edb
  - /o=First Orga
  - Administrator
  - Daniel Smith
  - Discovery Search Mailbox
  - Emma Williams
  - exchangebackup
  - Jacob Wilson
  - Juan Garcia
    - Calendar (0)
    - Contacts (0)
    - Deleted Items (0)
    - Drafts (0)
    - Inbox (5)
    - Journal (0)
    - Junk E-Mail (0)
    - Notes (0)
    - Outbox (0)
    - Sent Items (3)
    - Tasks (0)
  - Liam Miller
  - Maria Jones
  - Mariana Davis
  - Microsoft Exchange
  - Microsoft Exchange Approval Assistant
  - Microsoft Exchange Approval Assistant
  - Miguel Rodriguez
  - Olivia Brown
  - Online Archive - Test1
  - Online Archive - Test2
  - Sofia Johnson
  - SystemMailbox{1ec9f34a-a80f-45fc-a41f-2d
  - Test1
  - Test2

Type	Subject	Status	From	To	Attachments	Created
□	RE: Summary Table Q1 2013	✓	Liam Miller	Juan Garcia; Daniel Smith; Emma Wil...		11 Jun 2013, 18:09
□	Summary Table Q1 2013	✓	Juan Garcia	Daniel Smith; Daniel Smith; Emma Will...		11 Jun 2013, 18:07
□	RE: Meeting	✓	Daniel Smith	Juan Garcia		11 Jun 2013, 18:02
□	RE: Meeting	✓	Daniel Smith	Juan Garcia; Emma Williams		11 Jun 2013, 18:01
☑	RE: Meeting	✓	Daniel Smith	Emma Williams; Juan Garcia		11 Jun 2013, 18:00

Yes Emma, 1pm sharp!

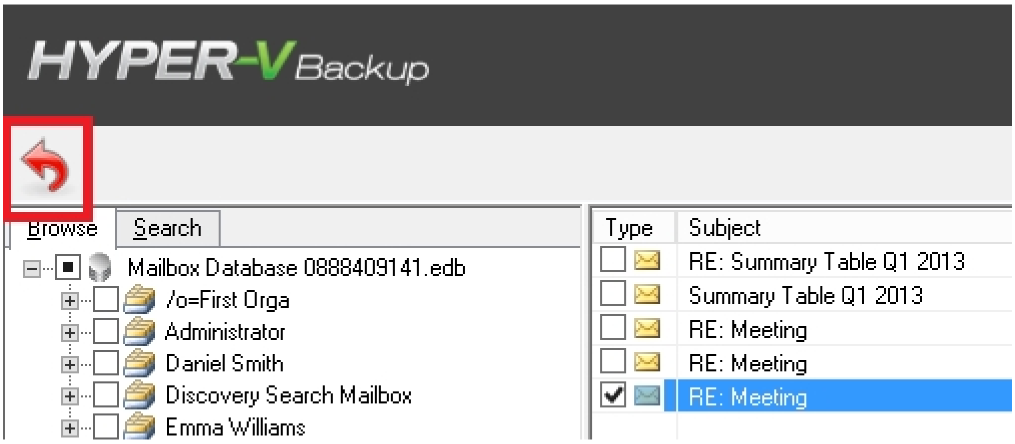
Will be there with Juan (CC'd)

From: Emma Williams
Sent: Tuesday, June 11, 2013 5:27 PM
To: Daniel Smith

Html body | Properties

Ready | Selected: 0 nodes, 1 items

9. Once you have selected all the items you wish to restore, click the restore button (Red Arrow) at the top left of the screen:



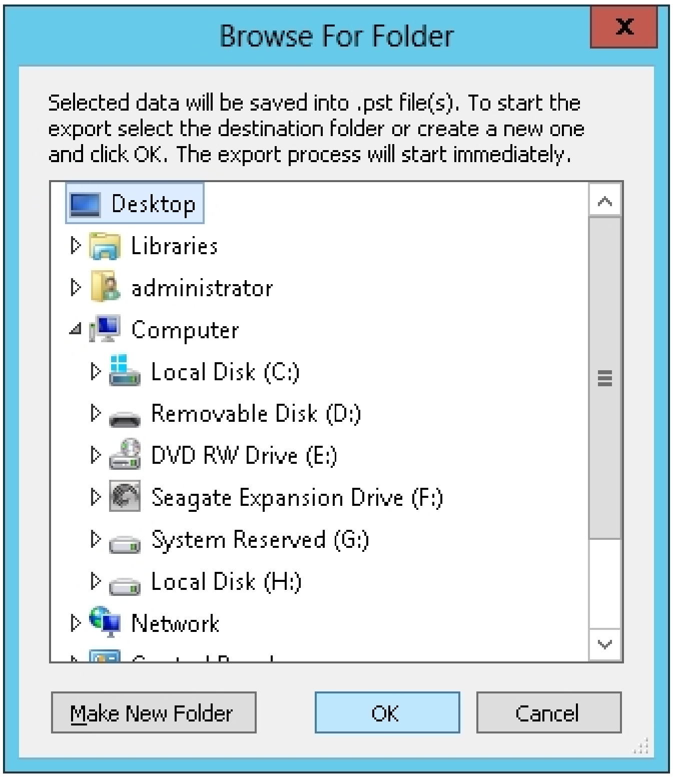
HYPER-V Backup

Browse | Search

- Mailbox Database 0888409141.edb
  - /o=First Orga
  - Administrator
  - Daniel Smith
  - Discovery Search Mailbox
  - Emma Williams

Type	Subject
□	RE: Summary Table Q1 2013
□	Summary Table Q1 2013
□	RE: Meeting
□	RE: Meeting
☑	RE: Meeting

10. You will be prompted to choose a location for the files to be restored to:



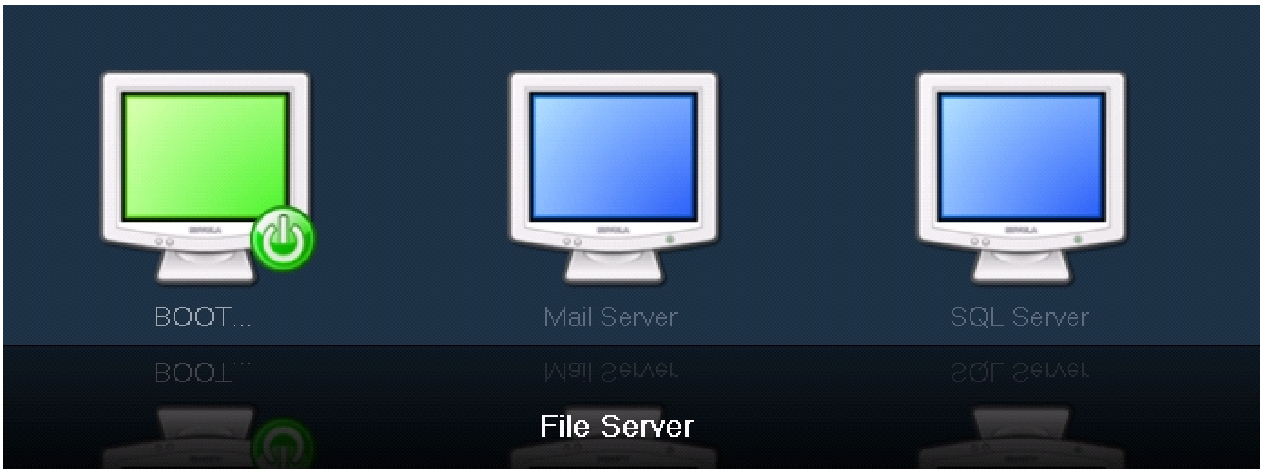
Browse For Folder

Selected data will be saved into .pst file(s). To start the export select the destination folder or create a new one and click OK. The export process will start immediately.

11. Choose where to restore the files to, and click **OK**.
    Once the process is complete the items will be restored to the chosen location in .PST format

12. After you have completed the restore, simply Unmount the VHDs using the button at the top right of the Exchange Restore console.

Boot From Backup Drive



This feature allows you to temporarily boot a VM directly from the backup drive without having to perform a full restore. This allows you to get the VM up and running within a very short amount of time. Allowing you to postpone a proper full recovery until a time when VM downtime is acceptable.

This works by creating a temporary differencing VHD file upon the backup drive. The differencing VHD is then attached to Hyper-V Server and booted. Eventually you can choose to commit the changes made while booted from the backup drive to the Hyper-V Host

Phase 1 - Boot From Backup Drive Procedure

1. A differencing VHD is created on the backup drive, configured to point to the VHD backup.
2. A VM is created on Hyper-V and configured to use the differencing disk.

Result: - The VM is booted directly from the backup drive ready to be used.

Phase 2 - Commit Changes and Restore VM / Discard Changes

Option 1 - Commit Changes and restore the VM to the Hyper-V Host (Within 36 hours of booting)

1. In this case the temporary VM is shut down and a restore is started.
2. Once the VHD files are copied locally then the differencing VHD is merged with the original VHD backup.

Result: - All changes are commited and the VM is available on the Hyper-V Host. (May take a few hours)

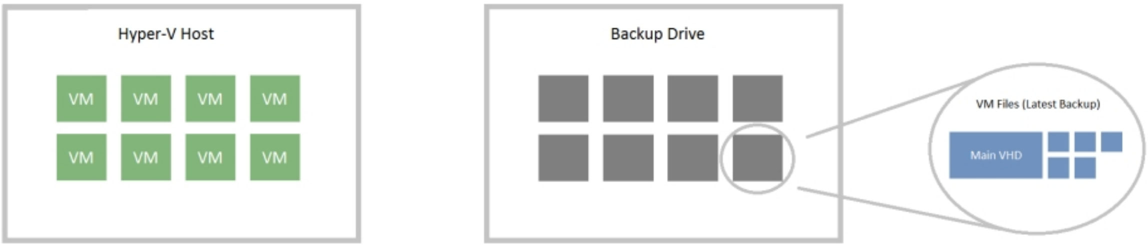
Option 2 - Discard temporary VM and all changes

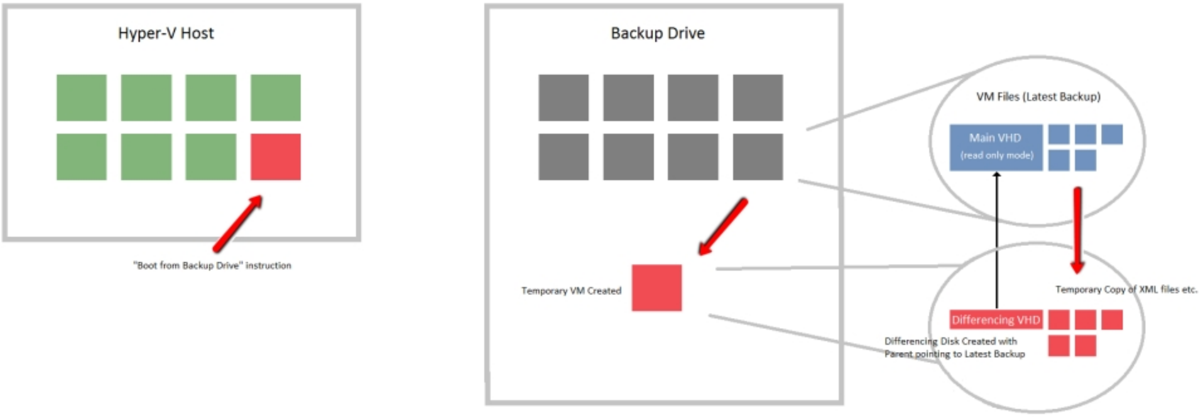
Should you choose to discard the changes done with the VM during Phase 1. Simply choose discard and the temporary VM will be removed from Hyper-V within seconds.

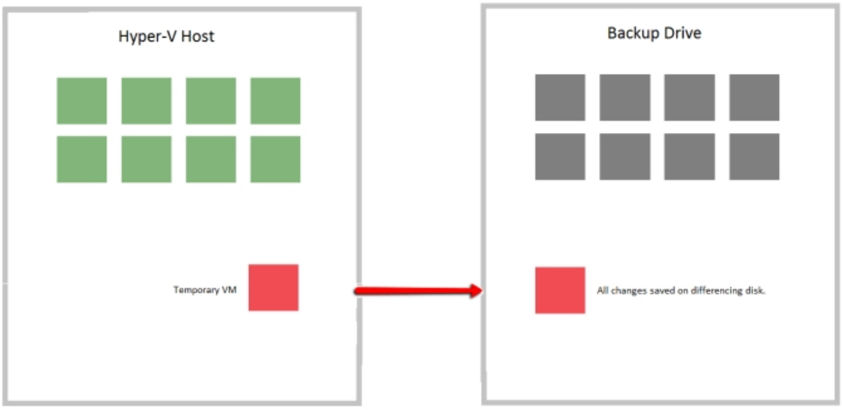
Important Considerations:

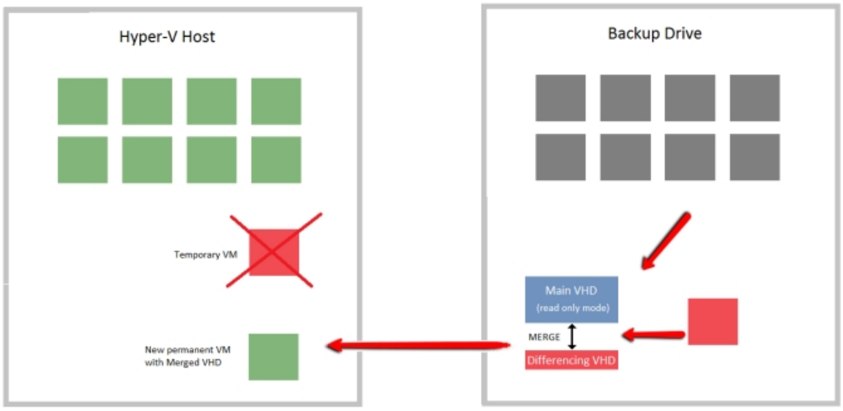
- The longer the VM is booted directly from the backup drive - the longer the merge (go live) process will take.
- VM Performance may be slower when booted directly from the backup drive.
- All backup and restore operations will be disabled while a VM is booted directly from backup drive.
- Boot from backup drive is only supported on locally connected disks and USB disks. Booting from a network path is not supported.

Diagram showing the Boot from Backup drive procedure:


Hyper-V Host
VM
VM
VM
VM
VM
VM
VM
VM
Backup Drive
VM Files (Latest Backup)
Main VHD


Hyper-V Host
"Boot from Backup Drive" instruction
Backup Drive
Temporary VM Created
VM Files (Latest Backup)
Main VHD
(read only mode)
Temporary Copy of XML files etc.
Differencing VHD
Differencing Disk Created with
Parent pointing to Latest Backup


Hyper-V Host
Temporary VM
Backup Drive
All changes saved on differencing disk.

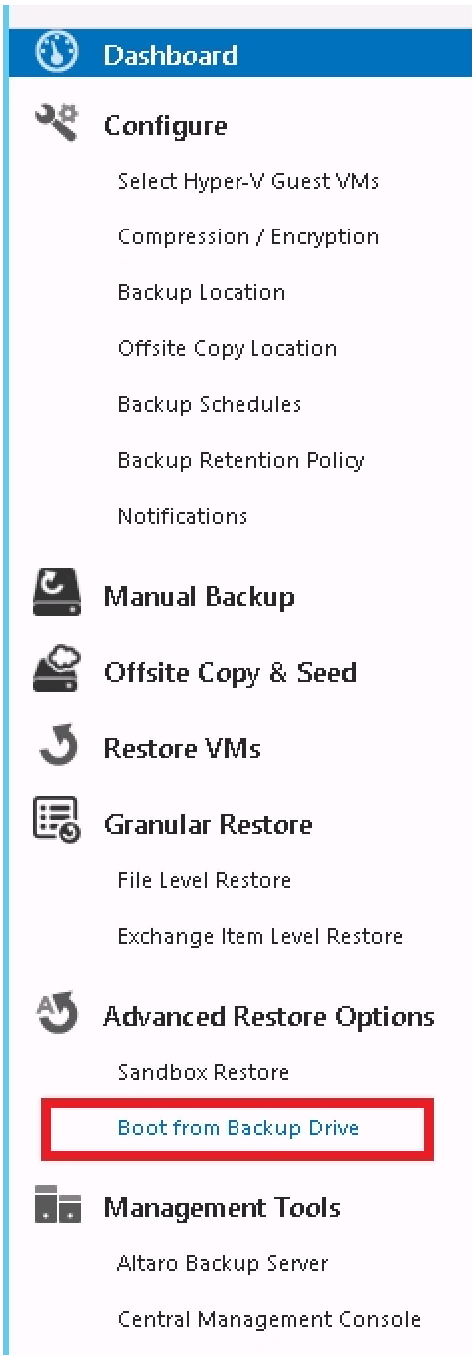

Hyper-V Host
Temporary VM
New permanent VM
with Merged VHD
Backup Drive
Main VHD
(read only mode)
MERGE
Differencing VHD

Phase 1: Boot a VM directly from the backup drive

Before reading this step by step tutorial please read the this section explaining the Boot From Backup drive feature and important considerations.

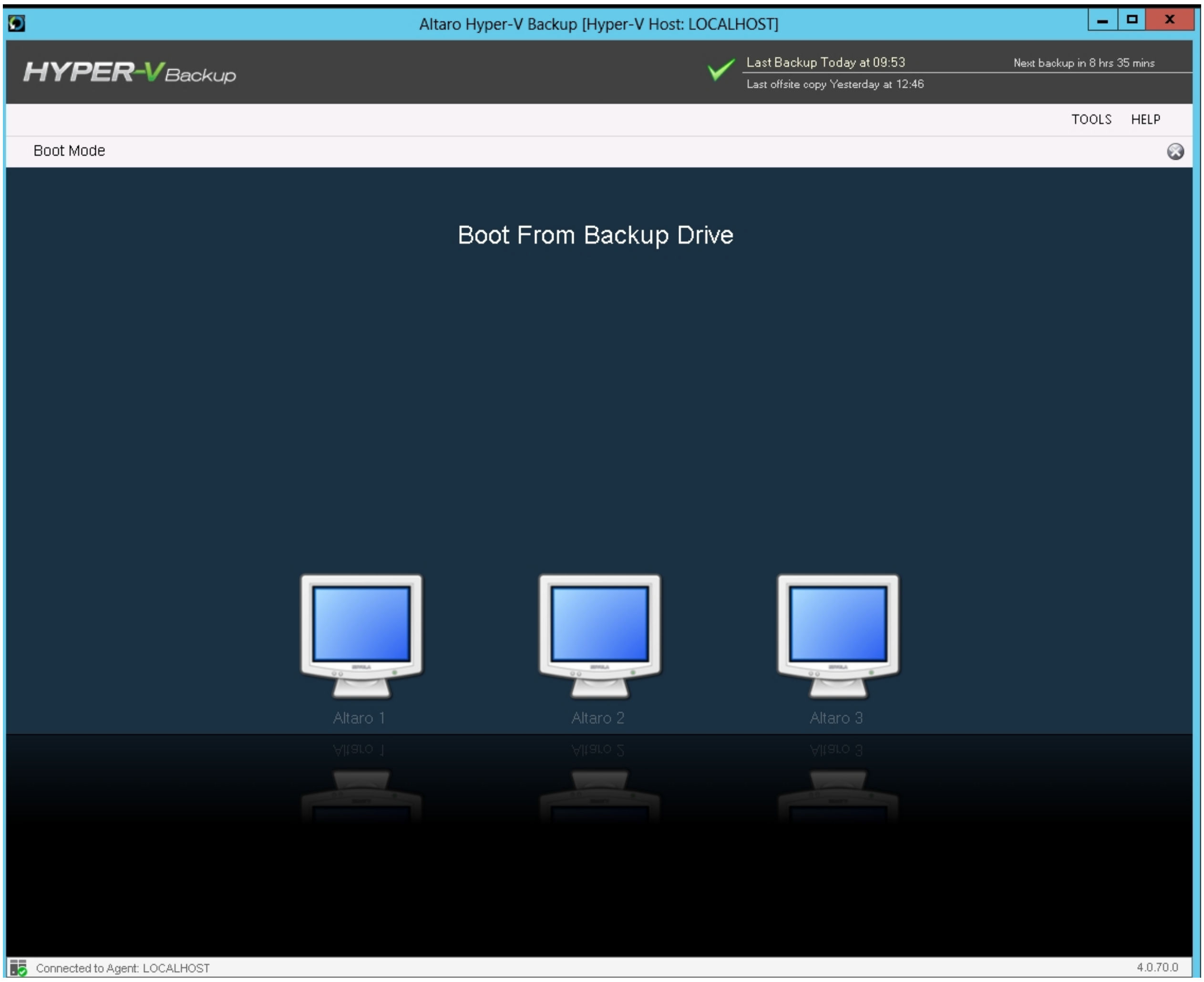
1. To Boot a VM directly from the VM backup first open the Altaro Management Console as explained here.

2. Once the Management Console has opened click on "Boot From Backup Drive" on the left hand side menu under "Advanced Restore Options".



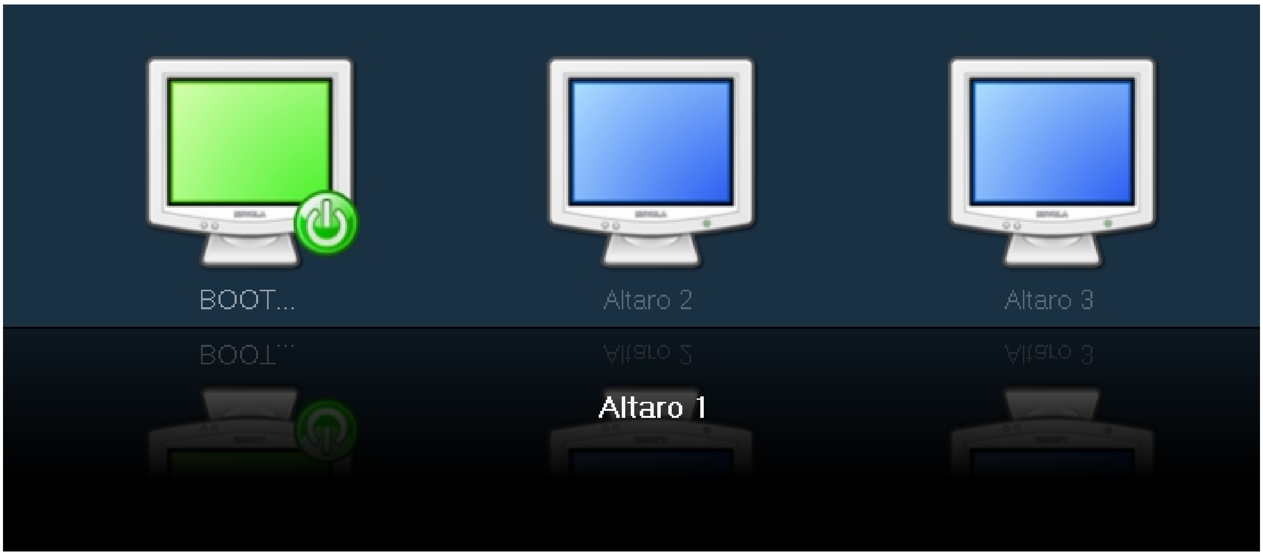
3. You will now be presented with the "Boot From Backup Drive" screen, assuming that the following requirements are met:

- You have selected a backup drive, selected VMs for backup and have taken atleast one successful backup.
- The backup drive is connected.
- The backup drive is a locally connected / USB drive and not a network path.



Altaro Hyper-V Backup [Hyper-V Host: LOCALHOST]
HYPER-V Backup
Last Backup Today at 09:53
Next backup in 8 hrs 35 mins
Last offsite copy Yesterday at 12:46
TOOLS
HELP
Boot Mode
Boot From Backup Drive
Altaro 1
Altaro 2
Altaro 3
Connected to Agent: LOCALHOST
4.0.70.0

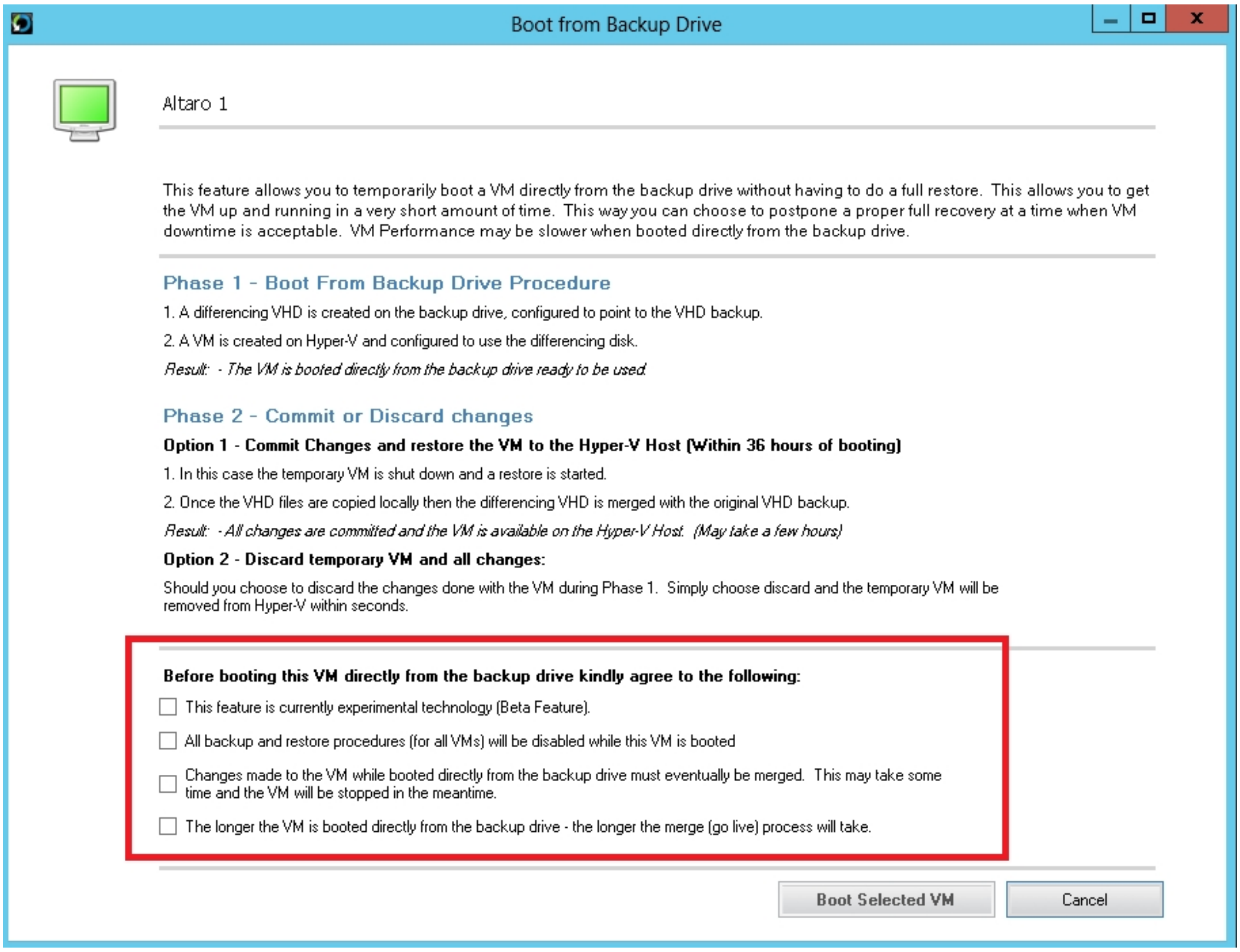
4. The Boot From Backup Screen will display a list of backed up VMs in a horizontal row. A horizontal scroll bar will appear below if they do not fit in one screen. Hovering the mouse over a VM will highlight it.



5. Click on a VM to bring up the Boot Window. This Window will allow you to boot the VM. Before you can click "Boot Selected VM" you must check all checkboxes on the Window. These Checkboxes ensure that you have read all the important considerations before proceeding.

These are the important considerations:

- The longer the VM is booted directly from the backup drive - the longer the merge (go live) process will take.
- VM Performance may be slower when booted directly from the backup drive.
- All backup and restore operations will be disabled while a VM is booted directly from backup drive.
- Boot from backup drive is only supported on locally connected disks and USB disks. Booting from a network path is not supported.



Boot from Backup Drive

Altaro 1

This feature allows you to temporarily boot a VM directly from the backup drive without having to do a full restore. This allows you to get the VM up and running in a very short amount of time. This way you can choose to postpone a proper full recovery at a time when VM downtime is acceptable. VM Performance may be slower when booted directly from the backup drive.

Phase 1 - Boot From Backup Drive Procedure

1. A differencing VHD is created on the backup drive, configured to point to the VHD backup.

2. A VM is created on Hyper-V and configured to use the differencing disk.

Result: - The VM is booted directly from the backup drive ready to be used

Phase 2 - Commit or Discard changes

Option 1 - Commit Changes and restore the VM to the Hyper-V Host (Within 36 hours of booting)

1. In this case the temporary VM is shut down and a restore is started.

2. Once the VHD files are copied locally then the differencing VHD is merged with the original VHD backup.

Result: - All changes are committed and the VM is available on the Hyper-V Host. (May take a few hours)

Option 2 - Discard temporary VM and all changes:

Should you choose to discard the changes done with the VM during Phase 1. Simply choose discard and the temporary VM will be removed from Hyper-V within seconds.

Before booting this VM directly from the backup drive kindly agree to the following:

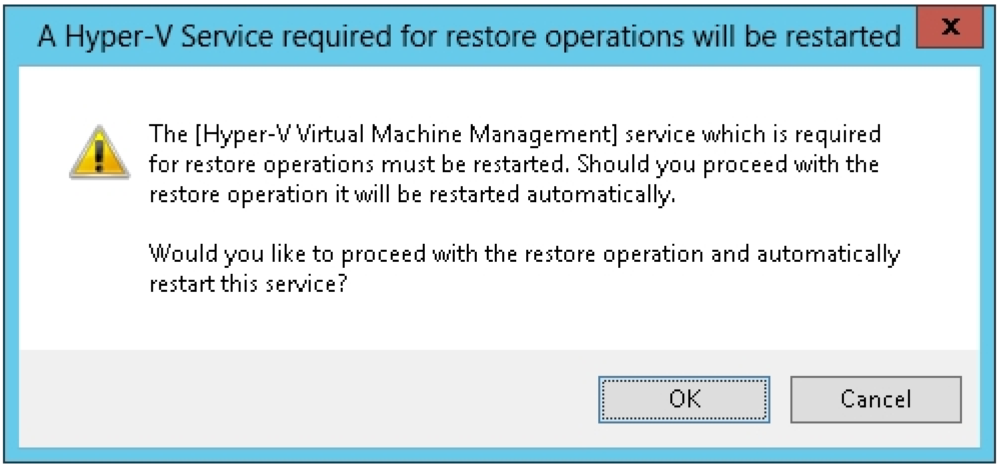
☐ This feature is currently experimental technology (Beta Feature).

☐ All backup and restore procedures (for all VMs) will be disabled while this VM is booted

☐ Changes made to the VM while booted directly from the backup drive must eventually be merged. This may take some time and the VM will be stopped in the meantime.

☐ The longer the VM is booted directly from the backup drive - the longer the merge (go live) process will take.

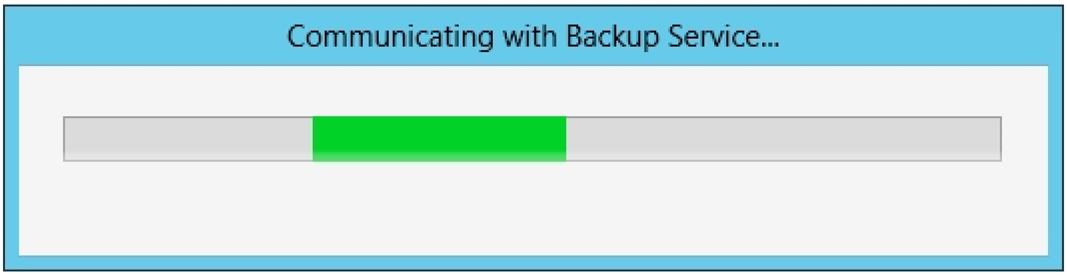
6. Click the "Boot Selected VM" to boot the VM from the backup drive. As with other restore operations the Hyper-V Virtual Machine Management Service must be restarted before you can proceed. Confirm that this is OK and the boot procedure will begin.



A Hyper-V Service required for restore operations will be restarted

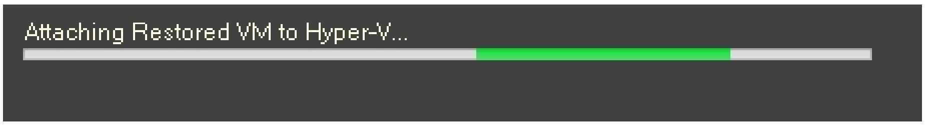
The [Hyper-V Virtual Machine Management] service which is required for restore operations must be restarted. Should you proceed with the restore operation it will be restarted automatically.

Would you like to proceed with the restore operation and automatically restart this service?



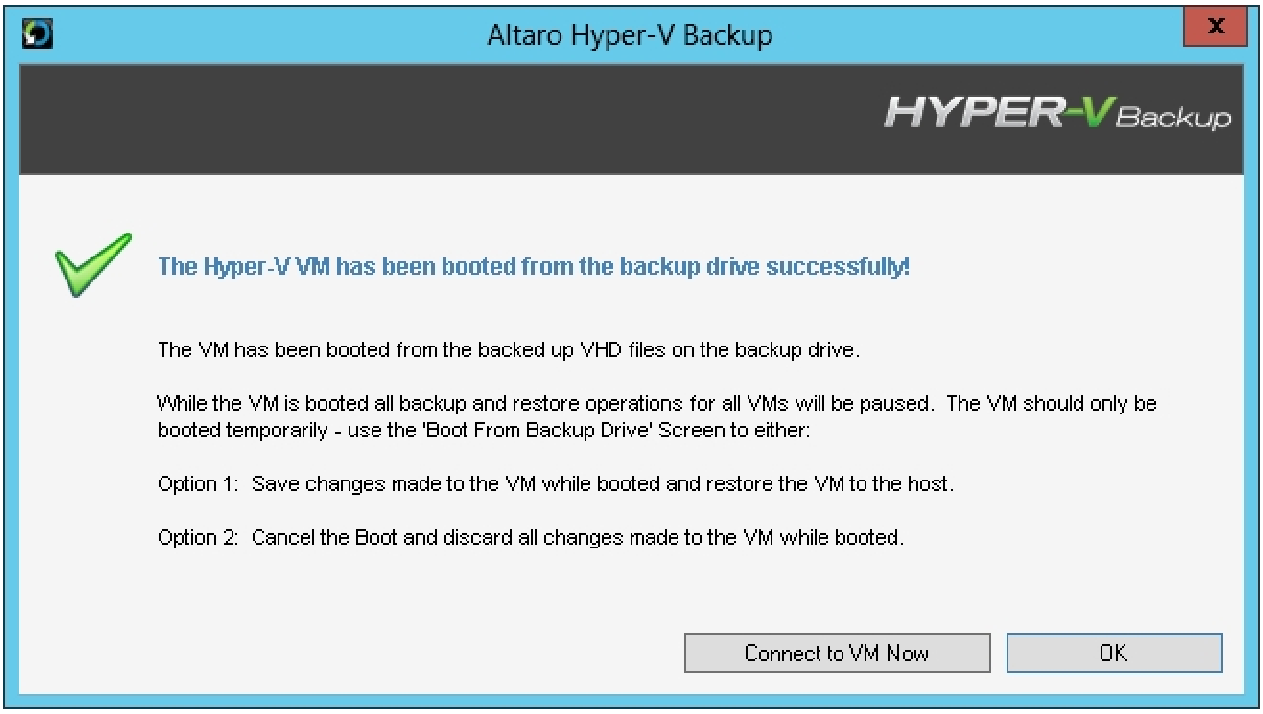
Communicating with Backup Service...

7. Once the Boot procedure begins you will see that the global progress bar is active and it will keep you updated on the progress.



Attaching Restored VM to Hyper-V...

8. After a minute or two, the VM will be booted directly from the backup drive and a dialog will be displayed indicating this. From this dialog you can choose to start the VM and connect to it using VMCONNECT. To do this click on the "Connect to VM Now" Button.



Altaro Hyper-V Backup

The Hyper-V VM has been booted from the backup drive successfully!

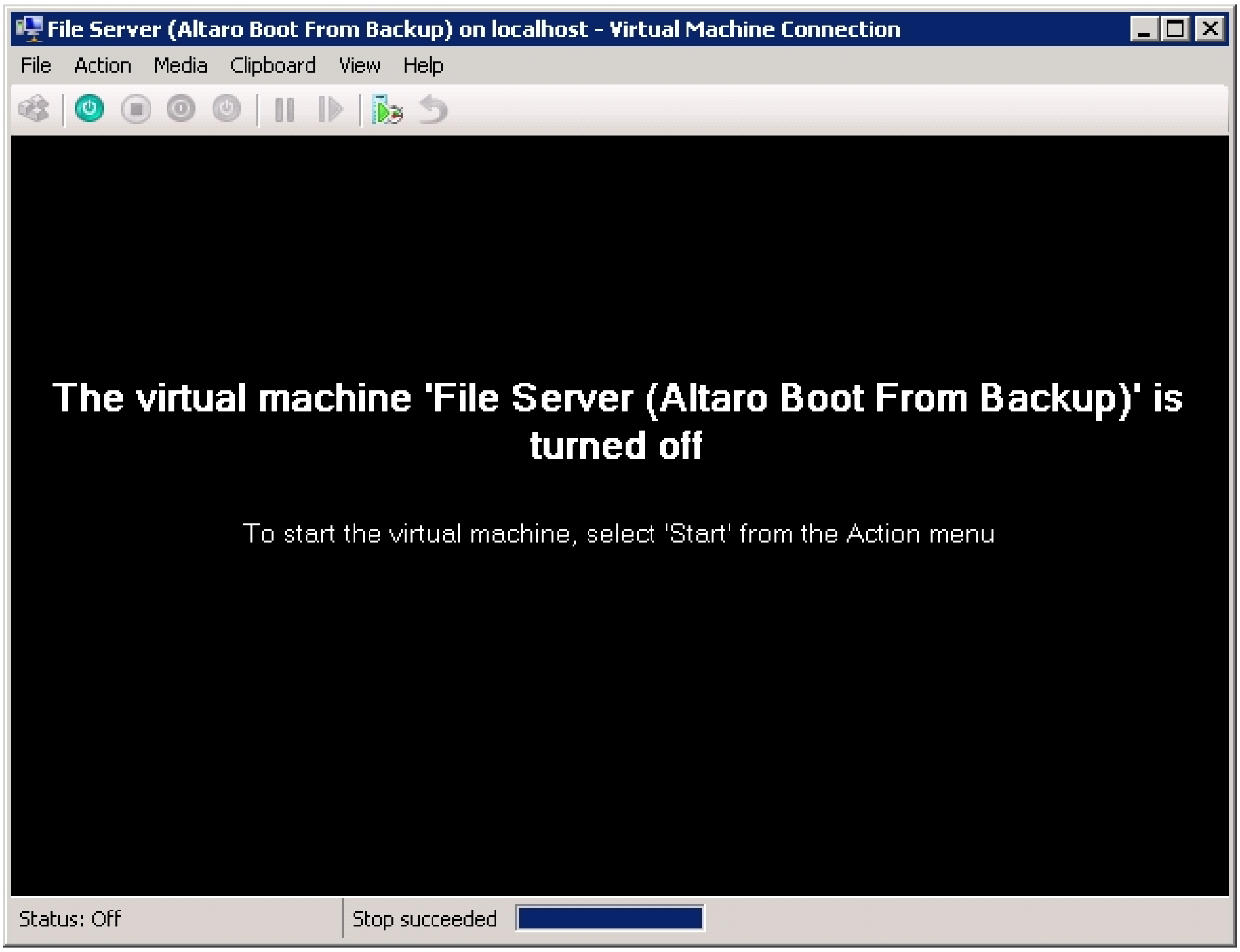
The VM has been booted from the backed up VHD files on the backup drive.

While the VM is booted all backup and restore operations for all VMs will be paused. The VM should only be booted temporarily - use the 'Boot From Backup Drive' Screen to either:

Option 1: Save changes made to the VM while booted and restore the VM to the host.

Option 2: Cancel the Boot and discard all changes made to the VM while booted.

9. If you choose to connect to the Booted VM you will see the "Virtual Machine Connection" Window as displayed below.



File Server (Altaro Boot From Backup) on localhost - Virtual Machine Connection

The virtual machine 'File Server (Altaro Boot From Backup)' is turned off

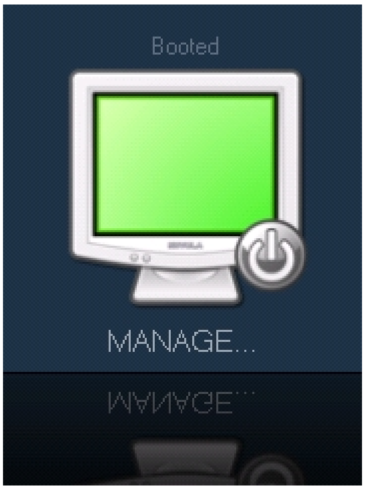
To start the virtual machine, select 'Start' from the Action menu

Status: Off

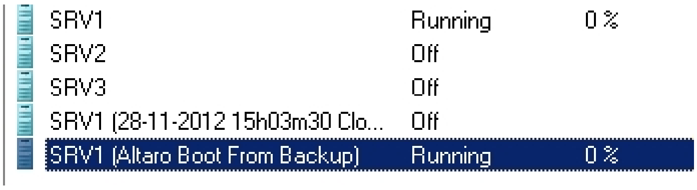
Stop succeeded

10. You will also notice that the VM on the Boot From Backup drive screen is now displayed in green and a "Booted" status is displayed above.

You can boot multiple VMs simultaneously but when one or more VMs are booted you will be unable to return to the Manager Screen.
It is also important to note that all backup and restore operations for all VMs will be disabled while a VM is booted from the backup drive.



11. A quick look at the Hyper-V server manager will show that a new VM has been created and is listed in the VM list. This VM is booted directly from the backup drive and has a suffix of "(Altaro Boot From Backup).



SRV1	Running	0 %
SRV2	Off	
SRV3	Off	
SRV1 (28-11-2012 15h03m30 Clo...	Off	
SRV1 (Altaro Boot From Backup)	Running	0 %

Phase 2:

While a VM is booted directly from the backup drive and is used it can be assumed that changes will be made to this VM. Therefore users have two options on how to deal with a VM that has been booted directly from the backup drive.

Option 1: Commit changes to the VM and restore it back to the host.
Option 2: Discard changes made to the VM and cancel the boot.

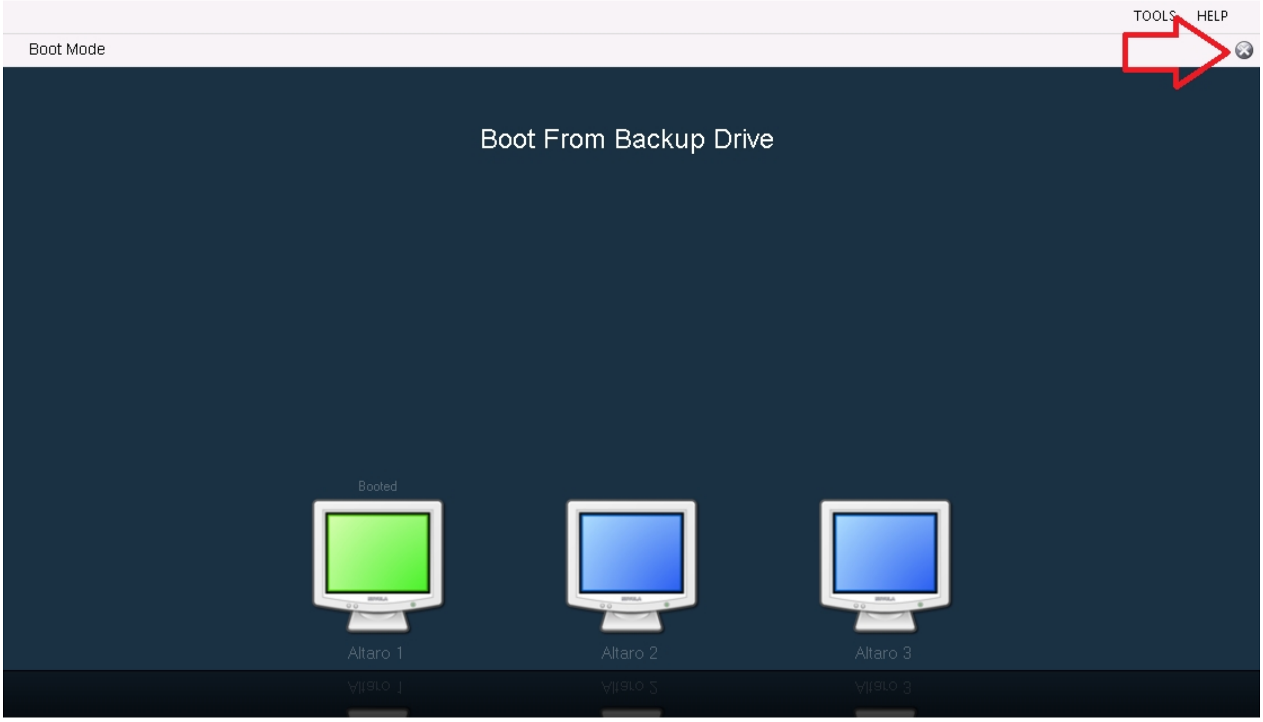
It is important that should Option 1 be chosen this is done **within a recommended 36 hours** from the boot from backup drive. This is recommended because a merge must be performed to commit the changes to the VM. The longer the VM has been booted for the more changes there will be and therefore the longer a merge will take.

A merge can take many hours and during a merge the VM must be turned off. Therefore the merge shoud be scheduled when VM downtime is possible.

Follow a step by step tutorial on Boot from Backup Drive: Phase 2 here.

Closing the Boot From Backup Drive screen and returning to the Manager Screen

At the top right corner of the Boot From Backup Drive screen is a close button which will return you to the Manager Screen.
This button is disabled while one or more VMs are booting or booted.



Phase 2: Commit Changes and Restore VM / Discard Changes

Before reading this step by step tutorial please read the this section explaining the Boot From Backup drive feature and important considerations.

While a VM is booted directly from the backup drive and is used it can be assumed that changes will be made to this VM. Therefore users have two options on how to deal with a VM that has been booted directly from the backup drive.

Option 1: Commit changes to the VM and restore it back to the host.
Option 2: Discard changes made to the VM and unboot it.

It is important that should Option 1 be chosen this is done **within a recommended 36 hours** from the boot from backup drive. This is recommended because a merge must be performed to commit the changes to the VM. The longer the VM has been booted for the more changes there will be and therefore the longer a merge will take.

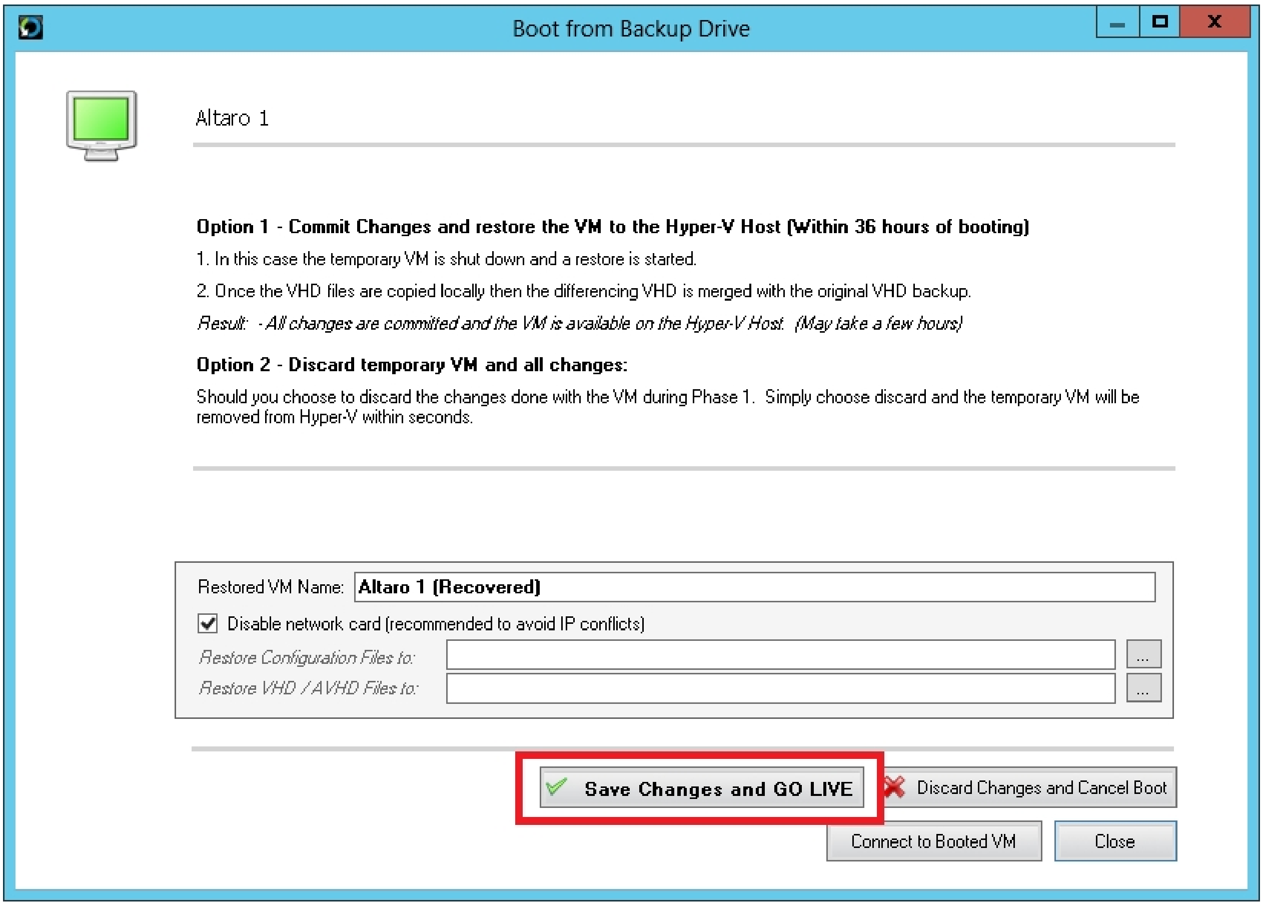
A merge can take many hours and during a merge the VM must be turned off. Therefore the merge shoud be scheduled when VM downtime is possible.

Option 1: Commit changes to the VM and restore it back to the host

- May take many hours.
- The VM must be turned off while restoring. (Schedule during acceptible VM downtime).

1. From the Boot From Backup screen click on a Booted VM. Booted VMs are always displayed in green and have a "booted" status displayed above them.

2. Once you click you will see the Boot Window. Three options are displayed: "Save Changes and Go Live", "Discard Changes and Cancel Boot", "Connect to VM". In this case we will be using the "**Save Changes and Go Live"** option.



Altaro 1

Option 1 - Commit Changes and restore the VM to the Hyper-V Host (Within 36 hours of booting)

1. In this case the temporary VM is shut down and a restore is started.

2. Once the VHD files are copied locally then the differencing VHD is merged with the original VHD backup.

Result: - All changes are commited and the VM is available on the Hyper-V Host. (May take a few hours)

Option 2 - Discard temporary VM and all changes:

Should you choose to discard the changes done with the VM during Phase 1. Simply choose discard and the temporary VM will be removed from Hyper-V within seconds.

Restored VM Name: **Altaro 1 (Recovered)**

☑ Disable network card (recommended to avoid IP conflicts)

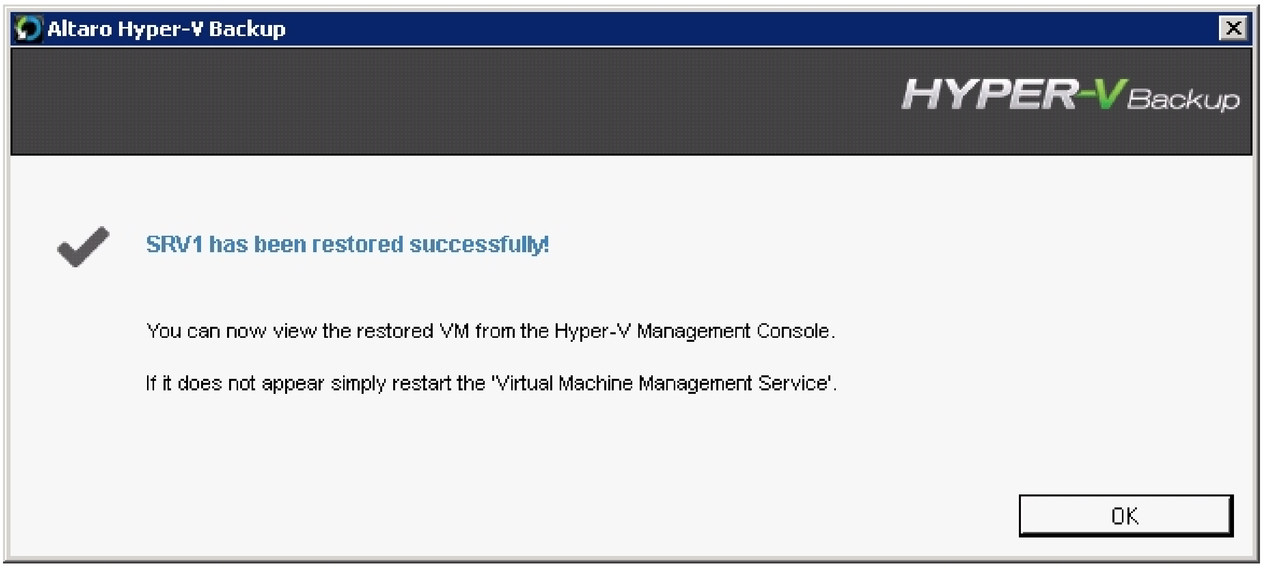
Restore Configuration Files to:

Restore VHD / AVHD Files to:

3. This option will:

- Ensure that the Booted VM has been stopped.
- Copy all VM files from the backup drive to the Hyper-V Host.
- Merge all changes which were made to the VM while booted.
- Attach the newly restored VM to Hyper-V

4. Once the VM has been restored successfully the following dialog will be displayed. The new VM will be listed in the Hyper-V Server Manager and the VM will no longer be booted directly from the backup drive.



SRV1 has been restored successfully!

You can now view the restored VM from the Hyper-V Management Console.

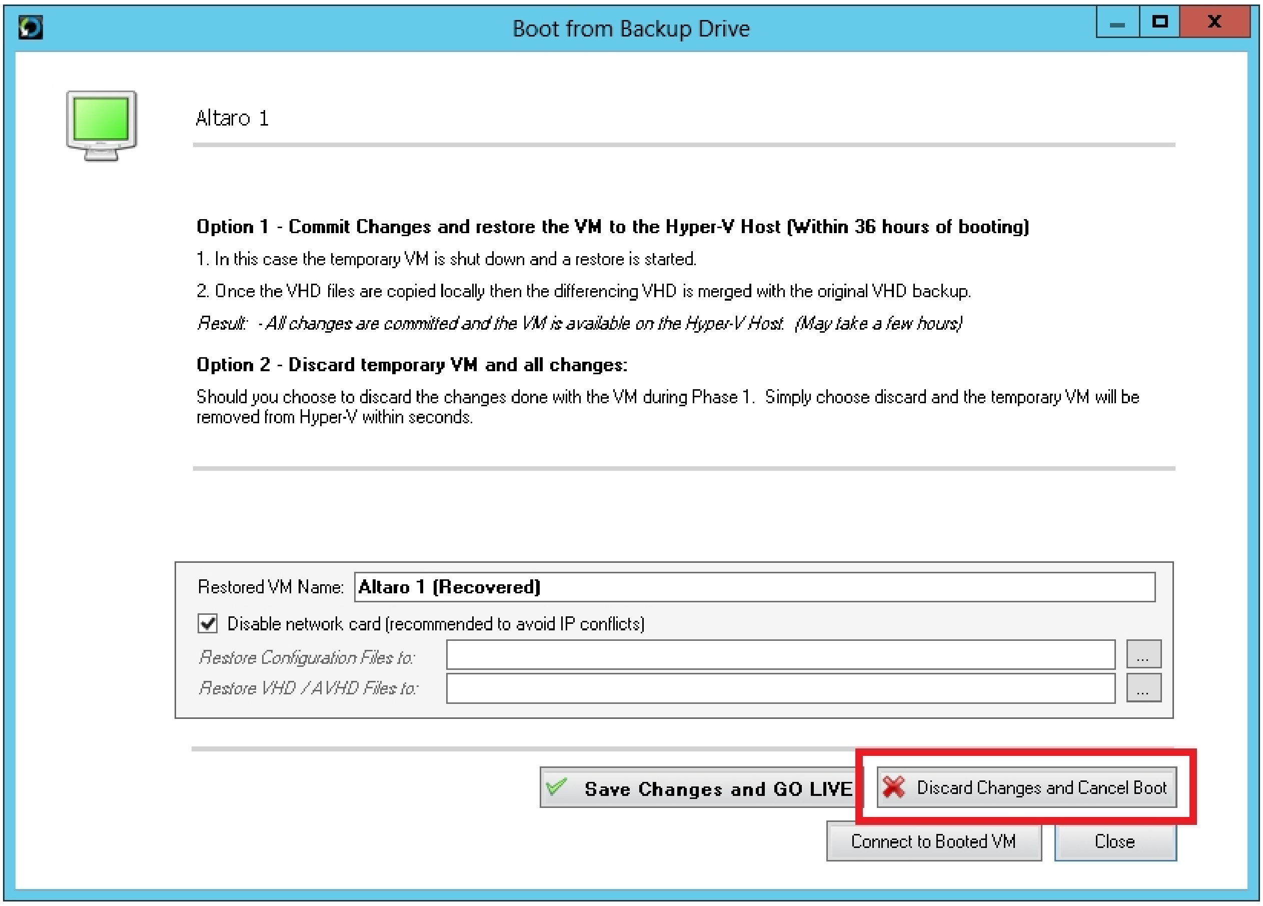
If it does not appear simply restart the 'Virtual Machine Management Service'.

Option 2: Discard changes and cancel boot

1. From the Boot From Backup screen click on a Booted VM. Booted VMs are always displayed in green and have a "booted" status displayed above them.

2. Once you click on a VM you will see the Boot Window. If you do not wish to commit any changes made while the VM was booted directly from the backup drive, you may simple click "**Discard Changes and Cancel Boot**".

3. This will only take a minute or two and the VM will no longer be booted from the backup drive. You may then choose to restore the last backed up version of that VM using the standard restore features.



Altaro 1

Option 1 - Commit Changes and restore the VM to the Hyper-V Host (Within 36 hours of booting)

1. In this case the temporary VM is shut down and a restore is started.

2. Once the VHD files are copied locally then the differencing VHD is merged with the original VHD backup.

Result: - All changes are commited and the VM is available on the Hyper-V Host. (May take a few hours)

Option 2 - Discard temporary VM and all changes:

Should you choose to discard the changes done with the VM during Phase 1. Simply choose discard and the temporary VM will be removed from Hyper-V within seconds.

Restored VM Name: **Altaro 1 (Recovered)**

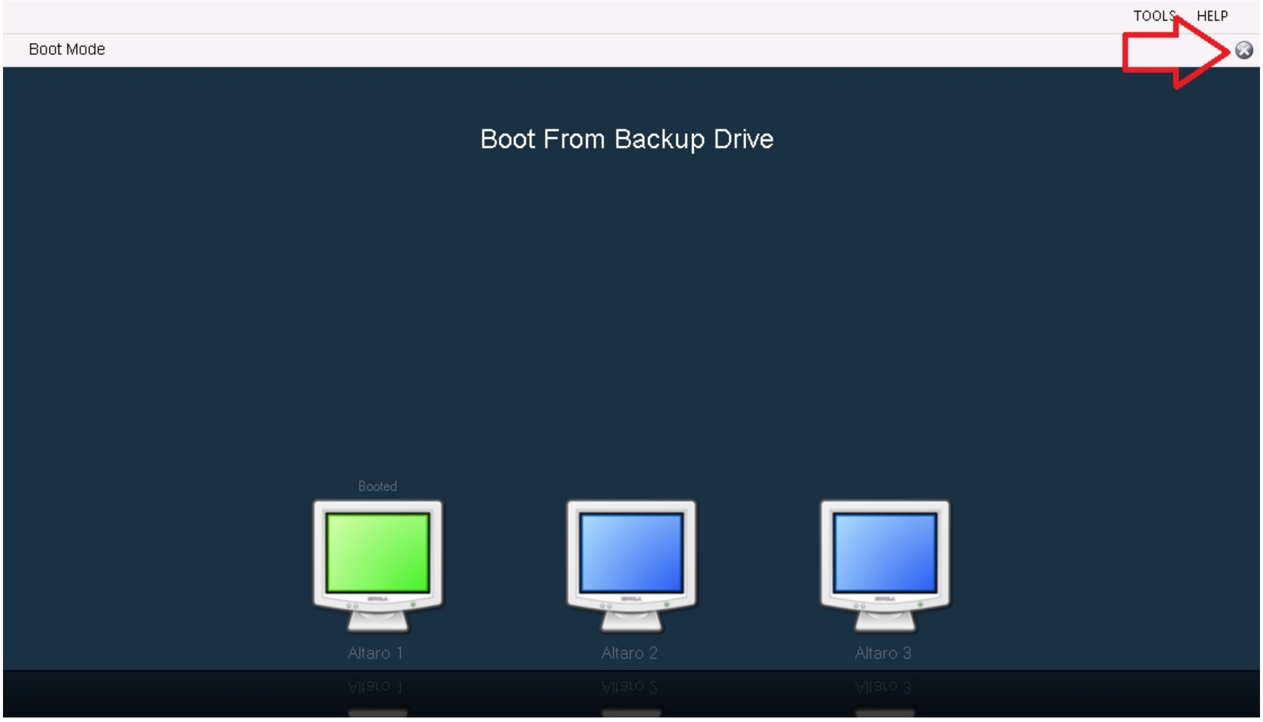
☑ Disable network card (recommended to avoid IP conflicts)

Restore Configuration Files to:

Restore VHD / AVHD Files to:

Closing the Boot From Backup Drive screen and returning to the Manager Screen

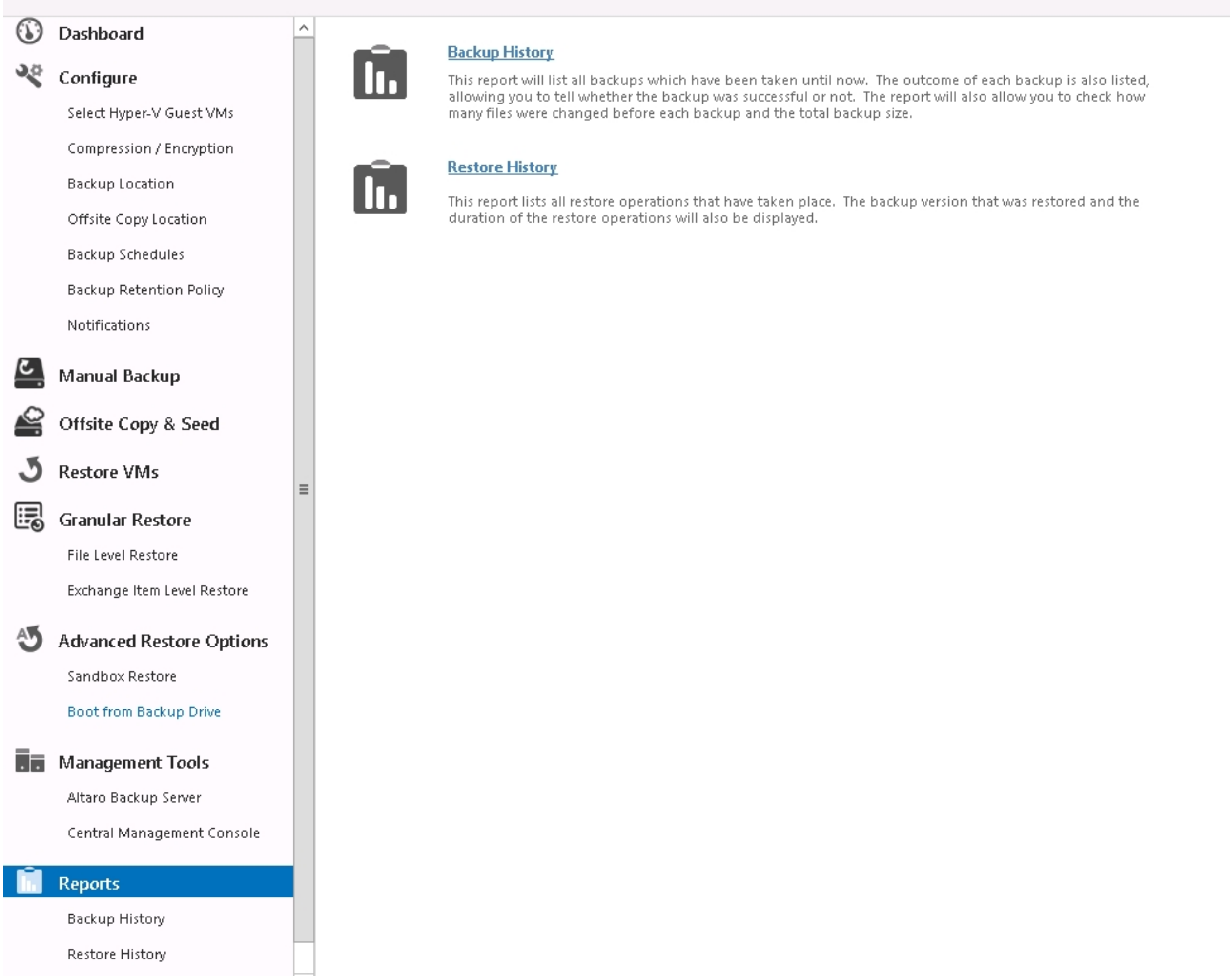
At the top right corner of the Boot From Backup Drive screen is a close button which will return you to the Manager Screen.
This button is disabled while one or more VMs are booting or booted.



Reports

To view reports simply open the **Management Console** and select the option **[Reports]** from the left hand side main menu.

Read instructions on how to open the Management Console here.



Backup History

This report will list all backups which have been taken until now. The outcome of each backup is also listed, allowing you to tell whether the backup was successful or not. The report will also allow you to check how many files were changed before each backup and the total backup size.

Restore History

This report lists all restore operations that have taken place. The backup version that was restored and the duration of the restore operations will also be displayed.

Three Reports are Available:

- Backup History Report
- Restore History Report

Backup History

The Backup History report displays the following information:

- The VM name that was backed up.
- Date and time of the backup.
- The backup status indicating whether the backup succeeded, succeeded with skipped files, or failed.
- The number of files backed up.
- The total size of the data that was backed up.
- The duration of the Backup.

View List of Skipped Files

Double-clicking on a backup which has a warning icon or error icon will bring up a list of files that were skipped during that backup. A reason why the file was skipped is also given.

View List of Backed up Files

Double-clicking on a successful backup will bring up a list of files that were backed up during that backup. Information on whether the file was created, changed, renamed or deleted is also given.

Alternatively you may right-click on a backup to bring up a context menu with all options.

Restore History

The Restore History report displays the following information:

- The VM name that was restored.
- Date and time of the restore operation.
- The restore status indicating whether the restore operation succeeded or failed.
- The duration of the restore operation.

Managing Backup Drives

- Supported Backup Destinations
- Configuring Backup Destinations
- Managing Backup Space

Supported Backup Destinations

The supported Backup Destinations are listed here.

Configuring Backup Destinations

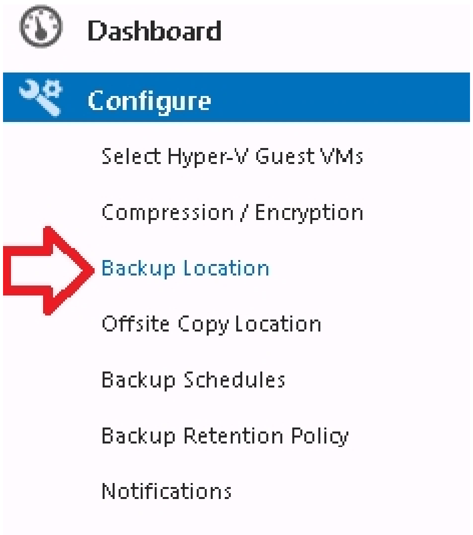
- Configuring your backup destination
- Selecting a Backup Drive using the "Backup Drive Selector"

- Selecting a Network Path using the "Backup Drive Selector"
- Changing your Primary Backup Drive Selection
- Multiple Primary Backup Drive Swapping
- Drive Swap using RDX Cartridges
- Configuring a Mirror Backup Drive
- Switching to the Mirror Backup Drive
- Backup Drives in a Hyper-V Cluster Environment

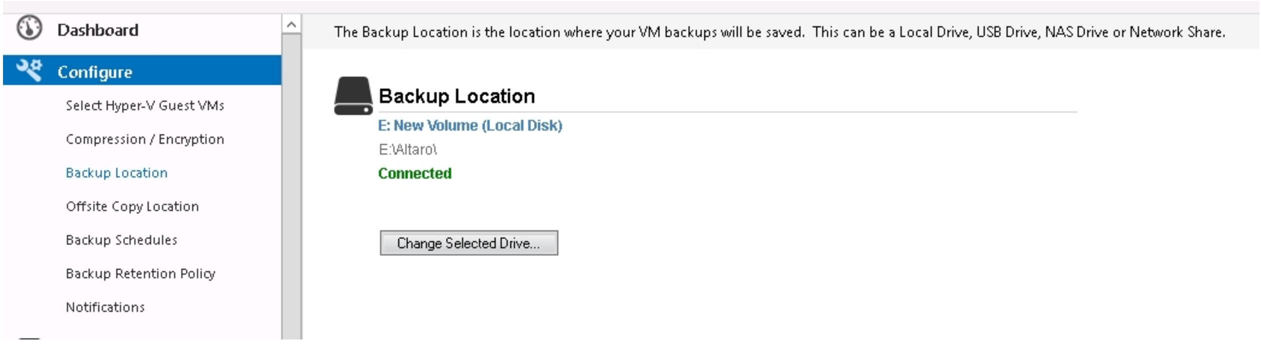
Configuring your backup destination

To select a drive or network path as your backup destination, open the **Management Console** and select the option **Backup Location** from the left hand side menu.

Read instructions on how to open the Management Console here.



Your current backup drive will be shown on the right as follows:



The Backup Location is the location where your VM backups will be saved. This can be a Local Drive, USB Drive, NAS Drive or Network Share.

Backup Location

E: New Volume (Local Disk)

E:\Altaro\

Connected

The next step is to click on the **'Change Selected Drive'** button, before configuring any of the other options. This will bring up the “Backup Drive Selector” window described here.

Important Terminology – Please read!

There are various ways the backup locations can be configured. Please read these definitions that are used throughout the rest of this document. Setting up the different configurations will be explained in more detail in the following sections of this document.

Backup Location:

Your Backup location (previously known as your primary drive) is a backup location to which the virtual machine files are copied directly from the host (via a shadow copy of the VM files).

Offsite Copy Location:

You may specify one or more *Offsite Copy Locations,* which will be a redundant copy of the primary drive. Backup data is always synchronized from the backup location to the offsite copy location, and backup data is never copied to the offsite copy location directly from the source files on the host. If the backup location is not connected, no data can be synchronized to the offsite copy location.

RDX cartridges:

You can also select an RDX cartridge enclosure as your *Offsite Copy Location*. In this case any cartridge inserted in the designated RDX enclosure will be used as your offsite copy drive.

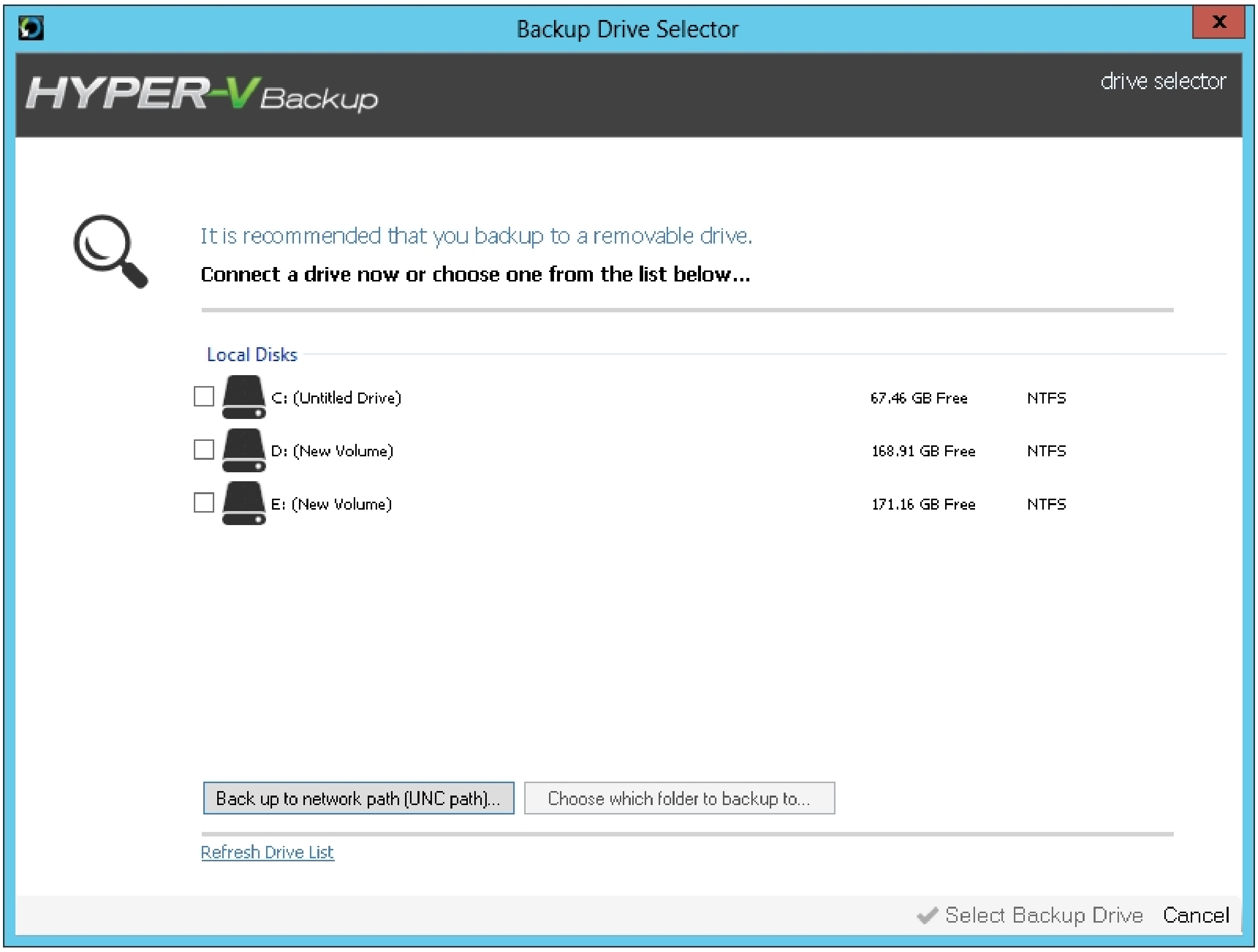
Selecting a Backup Drive using the "Backup Drive Selector"

The Backup Drive Selector will show after clicking the “Select Backup Drive” button here.

However, this window is also used in other areas related to the backup storage options, and other sections further below will refer to this section when required.

This section will describe locally attached storage. For backup locations on a network path, see this article.

This is an example of a typical Backup Drive Selector view:



It is recommended that you backup to a removable drive.

Connect a drive now or choose one from the list below...

Local Disks

□	C: (Untitled Drive)	67.46 GB Free	NTFS
□	D: (New Volume)	168.91 GB Free	NTFS
□	E: (New Volume)	171.16 GB Free	NTFS

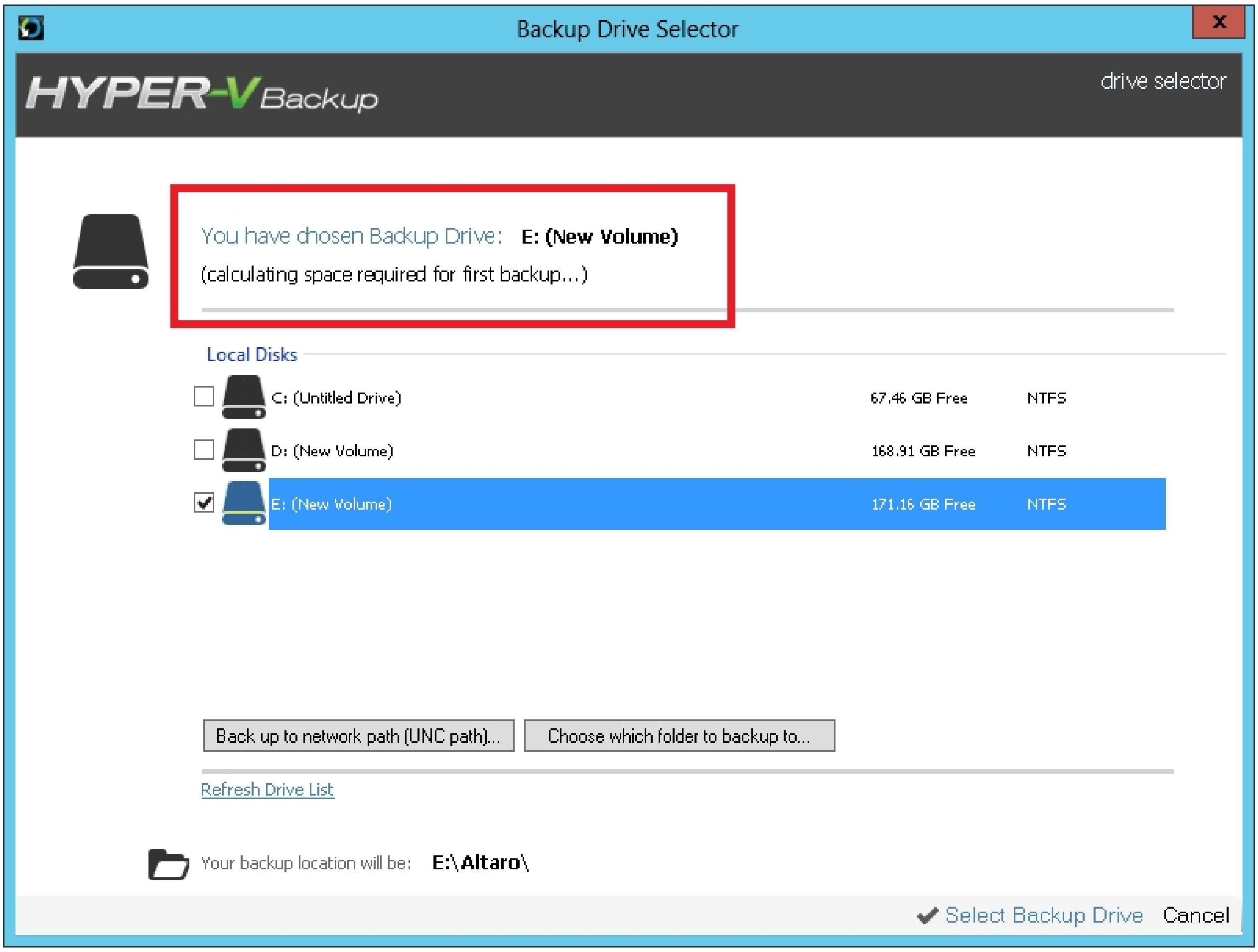
Back up to network path (UNC path)...
Choose which folder to backup to...
Refresh Drive List
✓ Select Backup Drive
Cancel

Removable Disks, which are usually recommended for this purpose over fixed local disks will be grouped together and shown at the top of the window.

Local Disks, although not recommended for backup storage, will still be shown under the heading “Local Disks” and will also be available for selection.

The right hand column will show the free space for each drive, and also the format of the drive, which for the purpose of Altaro Hyper-V Backup is recommended to be NTFS formatted.

Once you select a drive by clicking on the checkbox to the left of the drive icon, you will see the amount of space on the drive to be used at the top of the window as shown in the example for Drive C: below:



You have chosen Backup Drive: **E: (New Volume)**

(calculating space required for first backup...)

Local Disks

□	C: (Untitled Drive)	67.46 GB Free	NTFS
□	D: (New Volume)	168.91 GB Free	NTFS
☑	E: (New Volume)	171.16 GB Free	NTFS

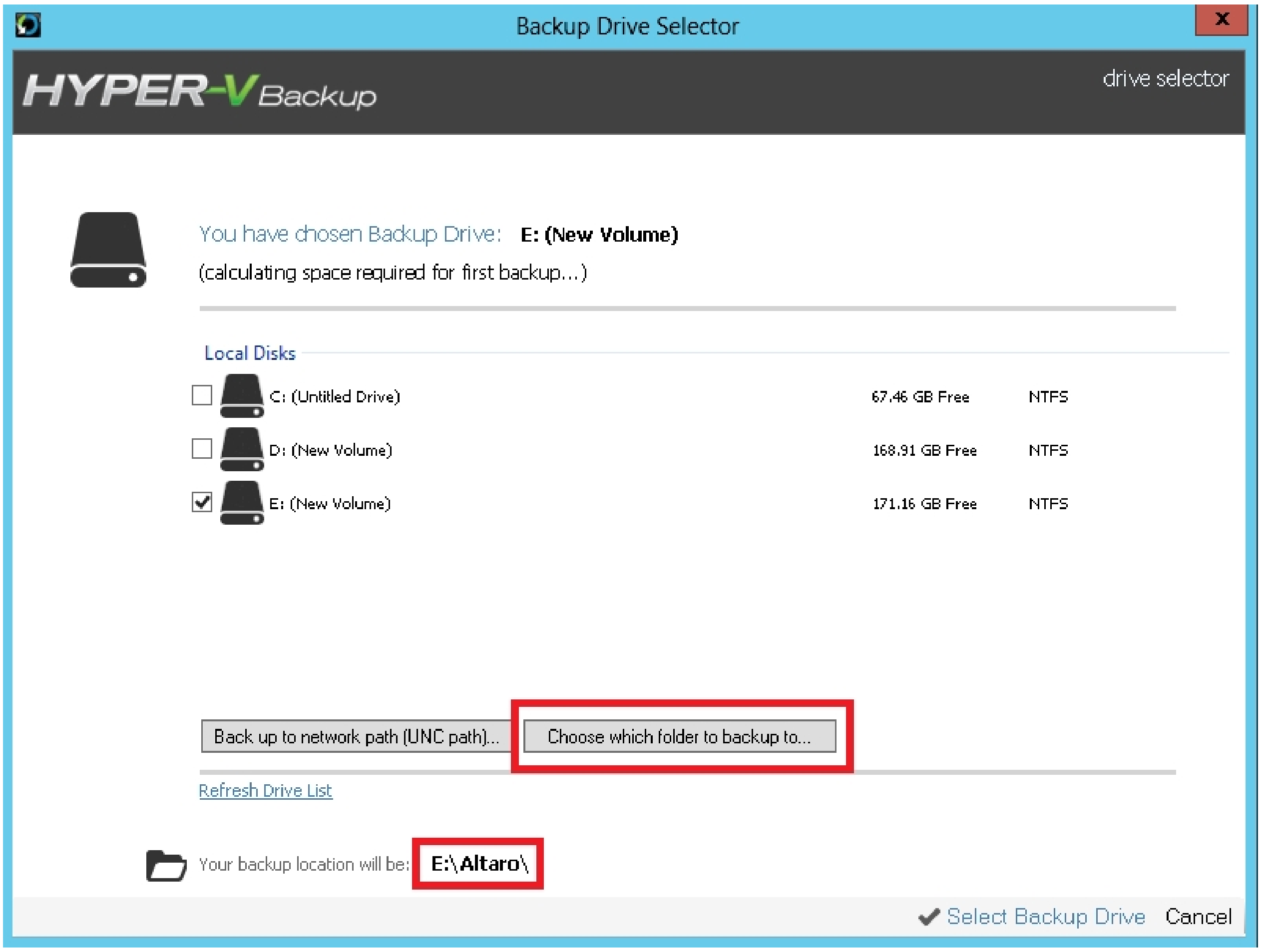
Back up to network path (UNC path)...
Choose which folder to backup to...
Refresh Drive List

Your backup location will be: **E:\Altaro\**

Using the same drive letter in the example above, the destination folder will by default be chosen as **E:\Altaro**.

This may be automatically changed to **E:\AltaroSharedFolder\Altaro** in case the backup location may need to be shared with other nodes on a cluster as described here.

You can change the default backup folder by clicking on the “Choose with folder to backup to” button at the bottom of the window as shown in the image below. Your backup location will be updated in the bold text below the link:



Backup Drive Selector

HYPER-V Backup

drive selector

You have chosen Backup Drive: **E: (New Volume)**

(calculating space required for first backup...)

Local Disks

□	C: (Untitled Drive)	67.46 GB Free	NTFS
□	D: (New Volume)	168.91 GB Free	NTFS
☑	E: (New Volume)	171.16 GB Free	NTFS

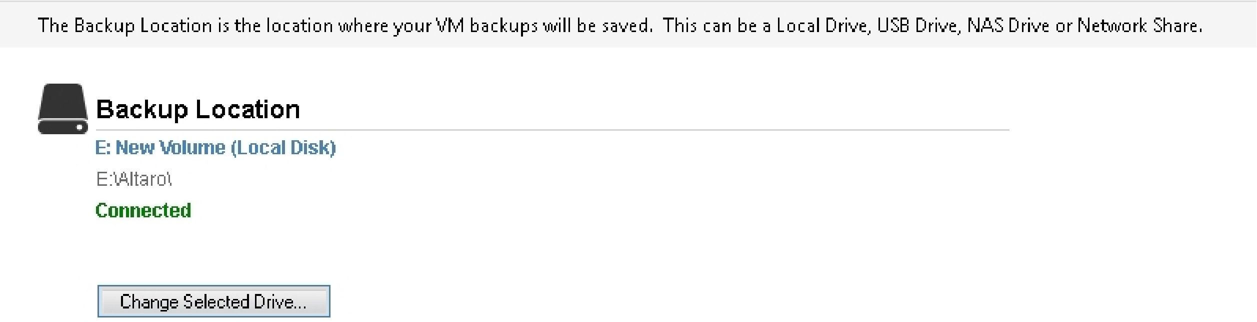
Back up to network path (UNC path)...
Choose which folder to backup to...
Refresh Drive List

Your backup location will be: **E:\Altaro\**

✓ Select Backup Drive
Cancel

Once you are done, click on the “Select Backup Drive” button at the bottom right of the window.

You will be returned to the main drive configuration panel, now showing the drive selected as shown below:



The Backup Location is the location where your VM backups will be saved. This can be a Local Drive, USB Drive, NAS Drive or Network Share.

Backup Location

E: New Volume (Local Disk)

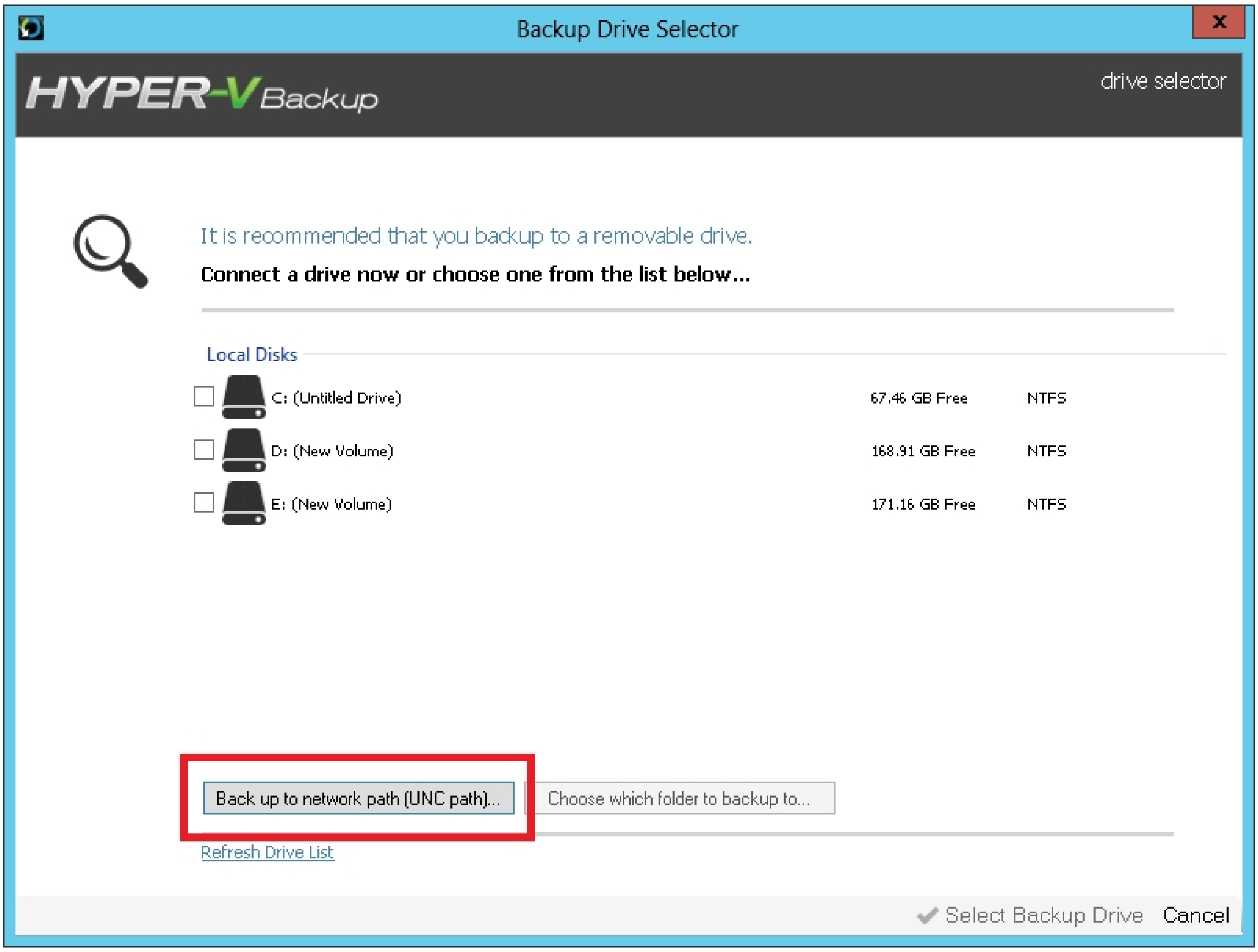
E:\Altaro\

Connected

If you have a Hyper-V cluster set up, configuring a locally attached backup location may require an extra step as described here.

Selecting a Network Path using the "Backup Drive Selector"

Selecting a UNC Path as your backup drive is very easy with Altaro Hyper-V Backup. Simply follow the instructions on selecting a backup drive here but click on the "**Backup up to a Network Path (UNC Path)...**" button when presented with the drive list.



Backup Drive Selector

HYPER-V Backup

drive selector

It is recommended that you backup to a removable drive.

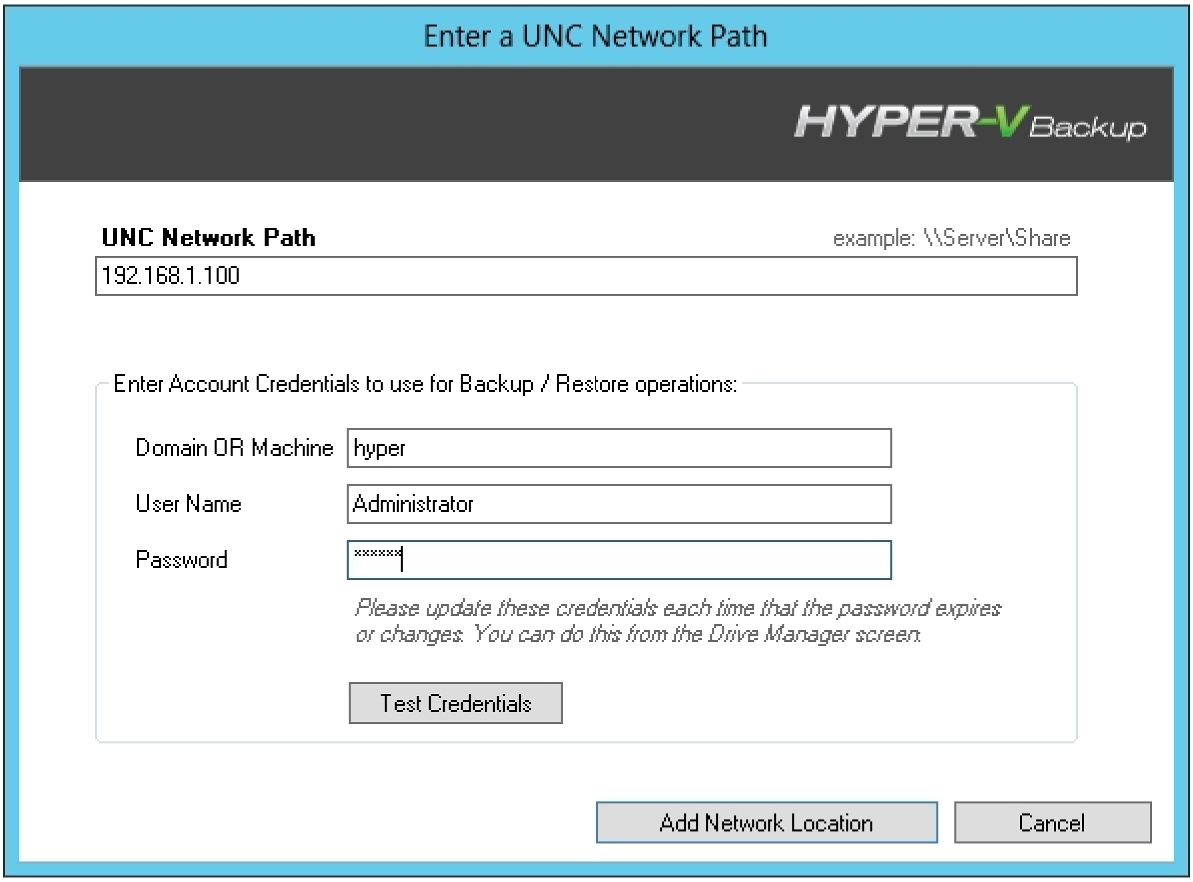
Connect a drive now or choose one from the list below...

Local Disks

□	C: (Untitled Drive)	67.46 GB Free	NTFS
□	D: (New Volume)	168.91 GB Free	NTFS
□	E: (New Volume)	171.16 GB Free	NTFS

Back up to network path (UNC path)...
Choose which folder to backup to...
Refresh Drive List
✓ Select Backup Drive
Cancel

This will bring up the following network path selection window:



Enter a UNC Network Path

UNC Network Path: 192.168.1.100

Enter Account Credentials to use for Backup / Restore operations:

Domain OR Machine: hyper

User Name: Administrator

Password: ******

Please update these credentials each time that the password expires or changes. You can do this from the Drive Manager screen.

Enter the network path in the topmost field. The supported formats here are:

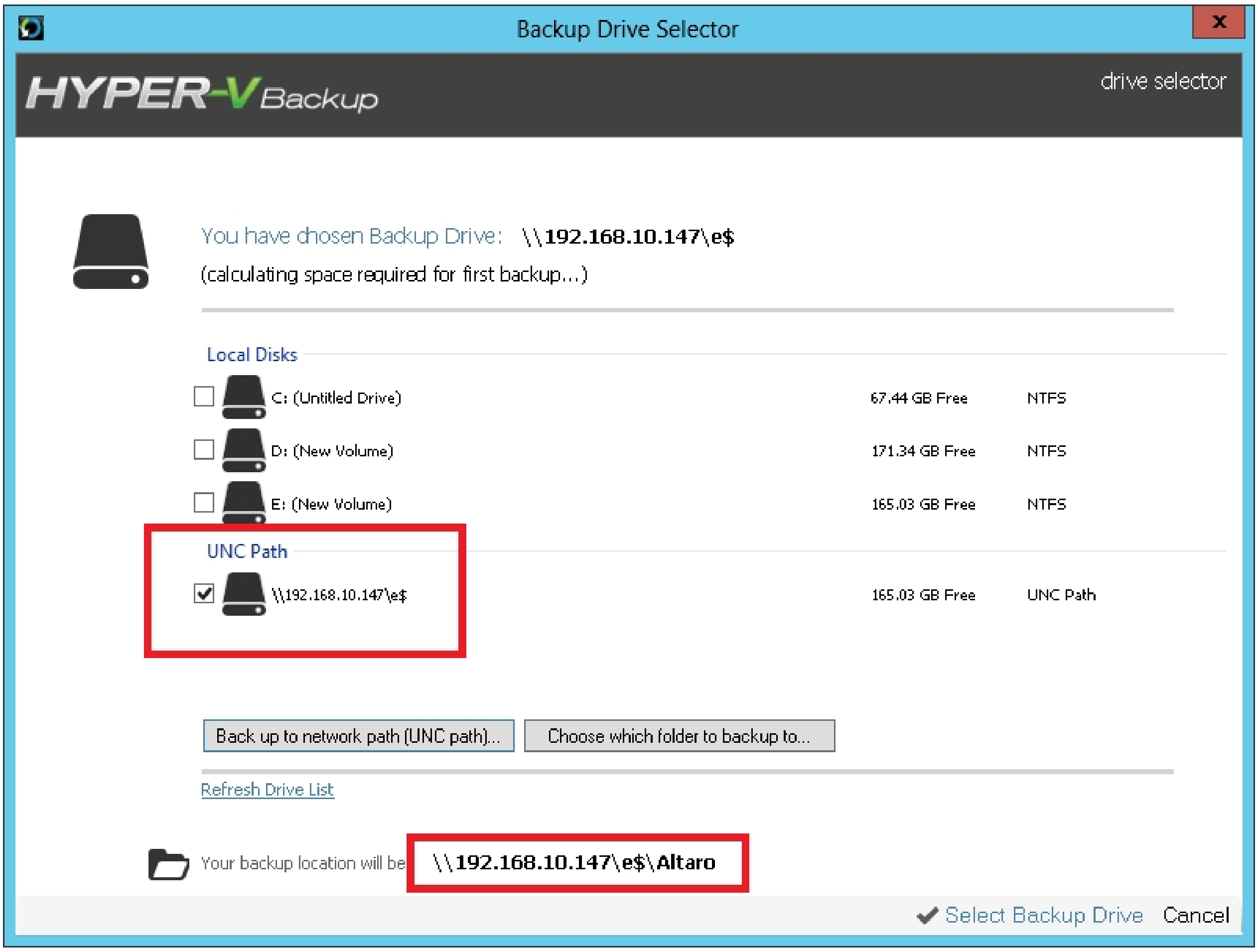
- \\IP Address\Share, for example \\192.168.10.110\Backup
- \\ServerName\Share, for example \\BackupServer\Backup
- Both of the above with one or more extra folders, for example \\192.168.10.110\Backup\Altaro

Entering a server name or IP address alone, for example “\\192.168.10.110” , alone with no share name, is not supported.

In the three lower fields, you must enter the domain name, or else the IP Address, with no slashes, of the backup destination, the username to be used to authenticate to the path, and the password. The password is never stored as plain text in the Altaro Hyper-V Backup configuration files.

An IP address is usually used instead of the domain name when the backup destination is not running Windows or is not part of the domain, for example a NAS drive enclosure or similar.

Once you are done, click on the “Test Credentials” to make sure the authentication works and then click “Add Network Location”. This will add the network path as an option in the drive selector window alongside the other detected drives:



You have chosen Backup Drive: \\192.168.10.147\e$

(calculating space required for first backup...)

Local Disks

□	C: (Untitled Drive)	67.44 GB Free	NTFS
□	D: (New Volume)	171.34 GB Free	NTFS
□	E: (New Volume)	165.03 GB Free	NTFS

UNC Path

☑	\\192.168.10.147\e$	165.03 GB Free	UNC Path

Your backup location will be \\192.168.10.147\e$\Altaro

You can also select any further subfolders to use for the backup location by clicking on "Choose with folder to backup to" link, as described here.

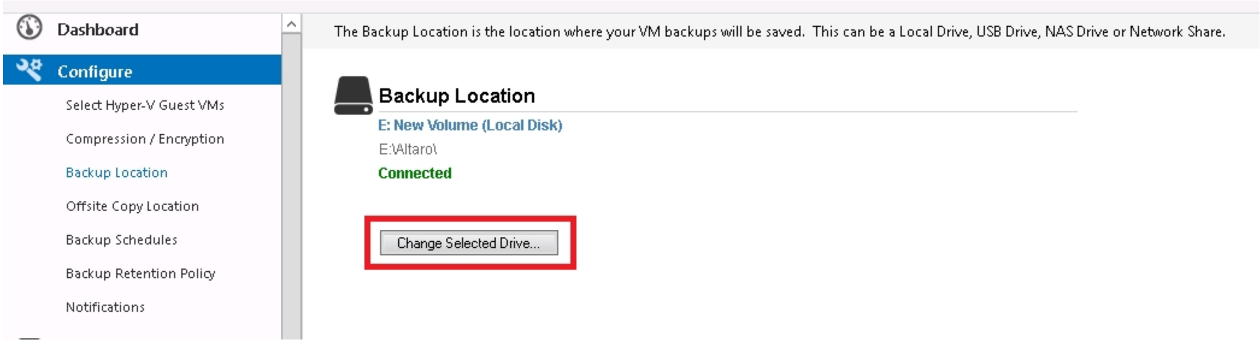
Once you are sure of your selection, click on "Select Backup Drive" at the bottom of the window as described here.

Changing your Primary Backup Drive Selection

If you are using a network path as your primary drive, or you have decided not to use the drive swap feature as described here and use only one primary drive, you may want to change the drive to another primary drive.

If you are using the drive swapping feature, you may also want to change the currently connected drive to a new location, with the option of migrating all the data as described further below.

To do this, click on the "Change Selected Drive" button shown in the image below:



Dashboard

Configure

Select Hyper-V Guest VMs

Compression / Encryption

Backup Location

Offsite Copy Location

Backup Schedules

Backup Retention Policy

Notifications

The Backup Location is the location where your VM backups will be saved. This can be a Local Drive, USB Drive, NAS Drive or Network Share.

Backup Location

E: New Volume (Local Disk)

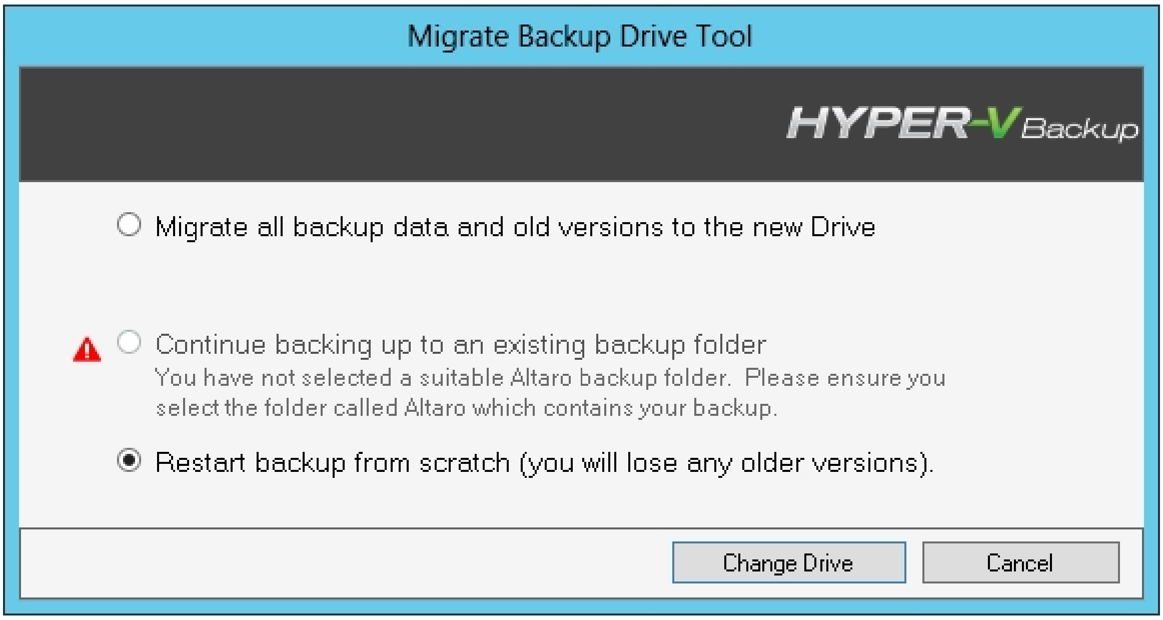
E:\Altaro\

Connected

Change Selected Drive...

Clicking the button will display the Drive Selector window, and you can choose an alternative primary drive location, locally attached or on a network path, as described here and here respectively.

Once you have chosen the new primary backup drive, you will be prompted with three options as shown below:



Migrate Backup Drive Tool

○ Migrate all backup data and old versions to the new Drive

○ Continue backing up to an existing backup folder
You have not selected a suitable Altaro backup folder. Please ensure you select the folder called Altaro which contains your backup.

● Restart backup from scratch (you will lose any older versions).

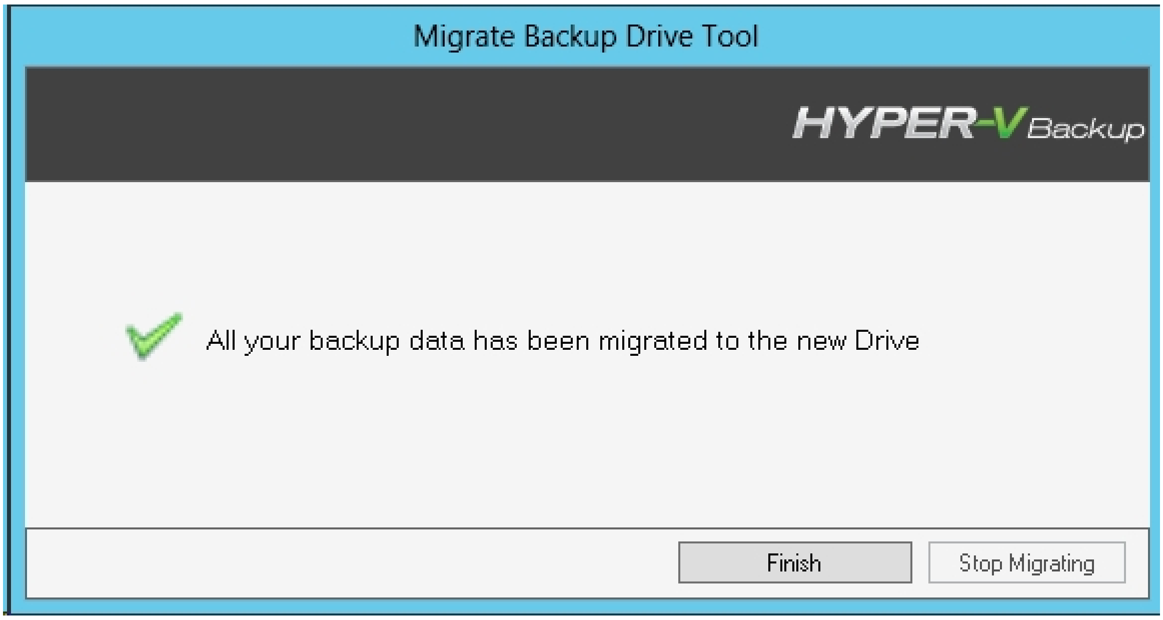
Change Drive | Cancel

The three options are explained below:

1) Migrate all backup data and old versions to the new drive.

This option is available when the previously selected primary drive is still available. If you choose this option, all data will be copied over to the new backup location, and the new backup drive will resume incremental backups seamlessly from the time of the last backup to the previously selected drive.

Please note that the migration procedure may take several hours depending on the amount of data that needs to be transferred. Once the migration is complete, you will be shown the following alert, and from that point on the backups may resume to the newly selected drive:



All your backup data has been migrated to the new Drive

2) Continue backing up to an existing backup folder

This option is enabled if the software detects that the newly selected primary drive was already used with the same backup configuration. You may choose this option if you would like to resume incremental backups on the newly selected drive, automatically linking to the previous backup available on that drive.

This option is useful when you want to move the location of the primary drive. For example if you have performed the first backup on a drive connected via USB, and then connected that same drive on a shared network path on another computer, you may re-map to the same backup drive using this option.

3) Restart backup from scratch

Choose this option when you do not want to copy any backup data from the previously connected drive (if available) and start the backups on the newly selected drive from scratch.

Configuring an Offsite Copy Location

With Altaro Hyper-V Backup you have the option of assigning one or many drives as second backup drive(s) - aka an Offsite Copy Location.
As described in here, a mirror drive is a redundant copy of the primary drive.

Your Offsite Copy Location can be either of the following:

- An Altaro Backup Server
- One or many locally connected USB drive(s)
- An RDX cartridge enclosure
- One or many NAS drive(s)
- One or many Network Folder Share(s) / UNC path(s)

Backup data is always synchronized from the backup location to the offsite copy location, and backup data is never copied to the offsite copy location directly from the source files on the host. If the backup location is not connected, no data can be synchronized to the offsite copy location.

To select a single Offsite Copy Location drive, follow the instructions described here.

To select multiple Offsite Copy Locations (i.e. Drive Swapping), follow the instructions described here.

To select an RDX cartridge enclosure as your Offsite copy Location, follow the instructions described here.

Offsite Copy Drive Swapping

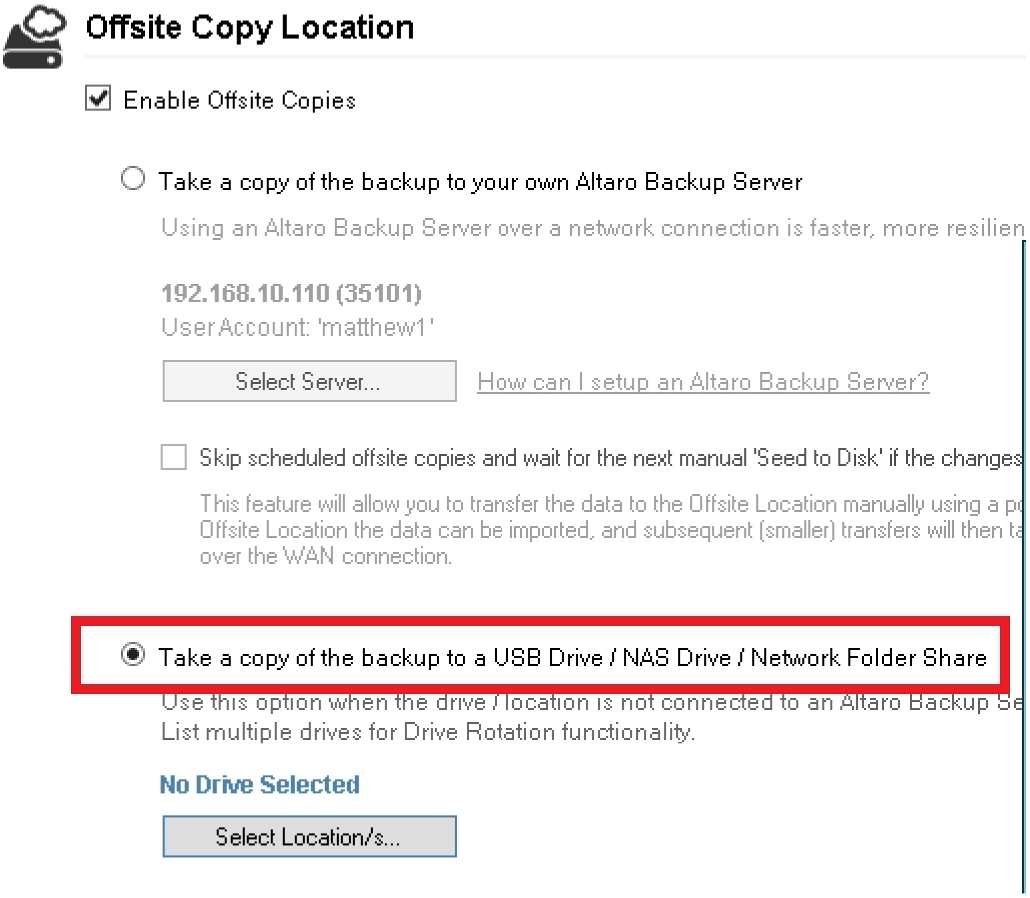
Altaro Hyper-V Backup allows you to configure multiple drives for your Offsite Copy location and allows you to swap between these drives seamlessly after they have been configured.

As described here, this option requires that you have already configured a local or network path as your original Backup Location.

To configure multiple drive swapping for your Offsite Copy Location, please proceed as follows:

1. From the Management console go to **Configure** >> **Offsite Copy Location**

2. Here choose the second radio button option to "**Take a copy of the backup to a USB Drive / NAS Drive / Network Share**" as shown below:



Offsite Copy Location

☑ Enable Offsite Copies

○ Take a copy of the backup to your own Altaro Backup Server

Using an Altaro Backup Server over a network connection is faster, more resilien

192.168.10.110 (35101)
User Account: 'matthew1'

□ Skip scheduled offsite copies and wait for the next manual 'Seed to Disk' if the changes

This feature will allow you to transfer the data to the Offsite Location manually using a p
Offsite Location the data can be imported, and subsequent (smaller) transfers will then t
over the WAN connection.

● Take a copy of the backup to a USB Drive / NAS Drive / Network Folder Share

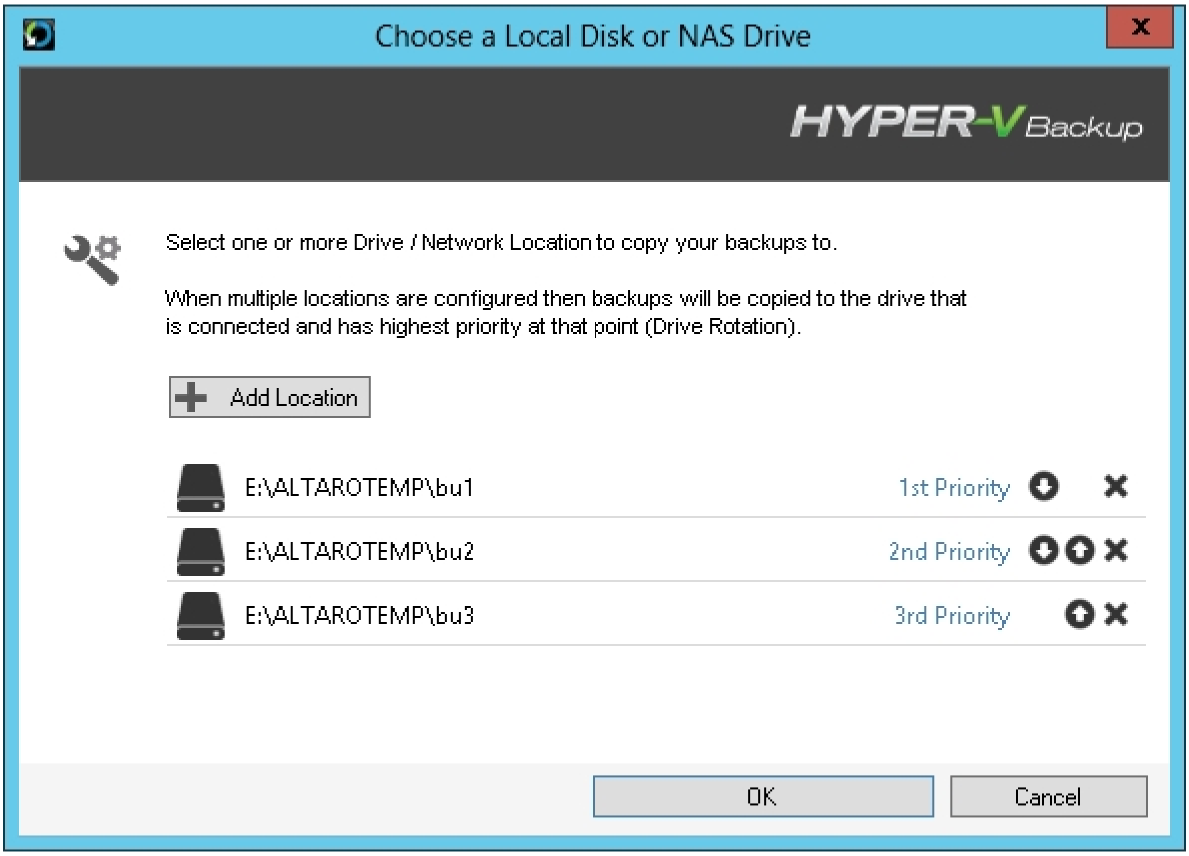
Use this option when the drive / location is not connected to an Altaro Backup Se
List multiple drives for Drive Rotation functionality.

No Drive Selected

3. Here click the "**Select Location(s)**" button and you will be prompted to choose one or many drives as your Offsite Copy Location(s)

4. Proceed to click the "**Add Location**" button which will load the Backup Drive Selector. Choose your drives as described here: Local Drives / Network Paths

5. Once you have added all your desired Offsite Copy locations, they will show in the drive selector prompt as follows:



Select one or more Drive / Network Location to copy your backups to.

When multiple locations are configured then backups will be copied to the drive that is connected and has highest priority at that point (Drive Rotation).

E:\ALTAROTEMP\bu1 1st Priority

E:\ALTAROTEMP\bu2 2nd Priority

E:\ALTAROTEMP\bu3 3rd Priority

6. **Note:** Only one Offsite Copy Location may be active at any one time, so when adding multiple locations, you must specify which locations will be activated if more than one location is simultaneously connected. This is done by moving the drives' position up or down in the list in order to change their priority. A drive with a *higher* priority will be preferred over a simultaneously connected drive with a *lower priority*.
You can modify the priority of each Location using the up and down arrows to the right of each location as shown above.

7. Click OK when done. Note that you may also add and remove Offsite Copy drives at a later stage.

The currently active Offsite Copy Location is switched to another location in either of two cases:

1) A location with a higher assigned priority is connected.

2) The currently connected location is disconnected and a location with a lower priority is available.

If one of the above occurs, you will see a notification stating that Altaro Hyper-V Backup is swapping the Offsite copy Location, and also the drive will temporarily show up as **disconnected.**

After a few seconds, the Management Console (if open) will automatically close in order for the new drive details to be loaded. In the current version, the Management Console will not reopen automatically, and must be launched again by the user if required.

Offsite Copy to RDX Cartridges

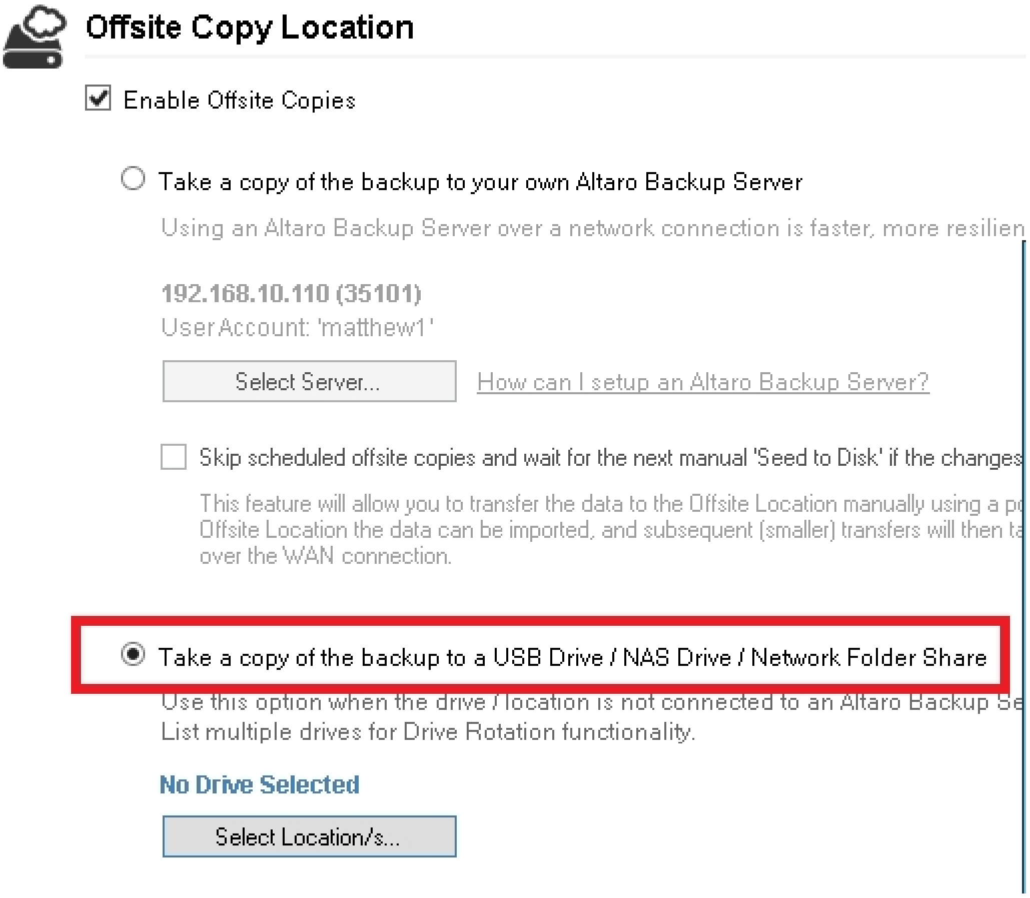
Altaro Hyper-V Backup allows you to configure RDX drives as your Offsite Copy location and allows you to swap between these drives seamlessly after they have been configured.

As described here, this option requires that you have already configured a local or network path as your original Backup Location.

To configure multiple RDX drives as your Offsite Copy Location, please proceed as follows:

1. From the Management console go to **Configure** >> **Offsite Copy Location**

2. Here choose the second radio button option to "**Take a copy of the backup to a USB Drive / NAS Drive / Network Share**" as shown below:



Offsite Copy Location

☑ Enable Offsite Copies

○ Take a copy of the backup to your own Altaro Backup Server

Using an Altaro Backup Server over a network connection is faster, more resilien

192.168.10.110 (35101)
User Account: 'matthew1'

□ Skip scheduled offsite copies and wait for the next manual 'Seed to Disk' if the changes

This feature will allow you to transfer the data to the Offsite Location manually using a p
Offsite Location the data can be imported, and subsequent (smaller) transfers will then t
over the WAN connection.

● Take a copy of the backup to a USB Drive / NAS Drive / Network Folder Share

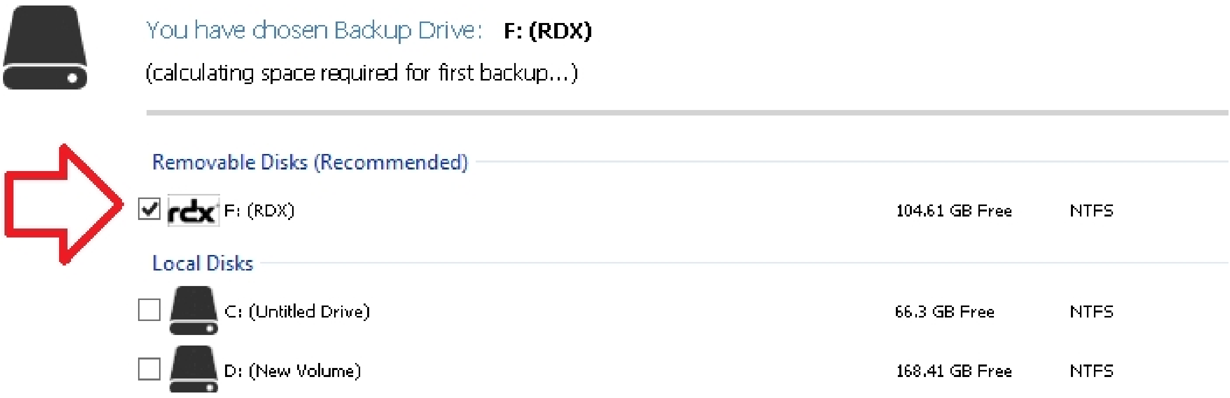
Use this option when the drive / location is not connected to an Altaro Backup Se
List multiple drives for Drive Rotation functionality.

No Drive Selected

3. Here click the "**Select Location(s)**" button and you will be prompted to choose one or many drives as your Offsite Copy Location(s)

4. Proceed to click the "**Add Location**" button which will load the Backup Drive Selector.

5. You will see your RDX drive listed here as shown below:



You have chosen Backup Drive: **F: (RDX)**

(calculating space required for first backup...)

Removable Disks (Recommended)

☑	F: (RDX)	104.61 GB Free	NTFS

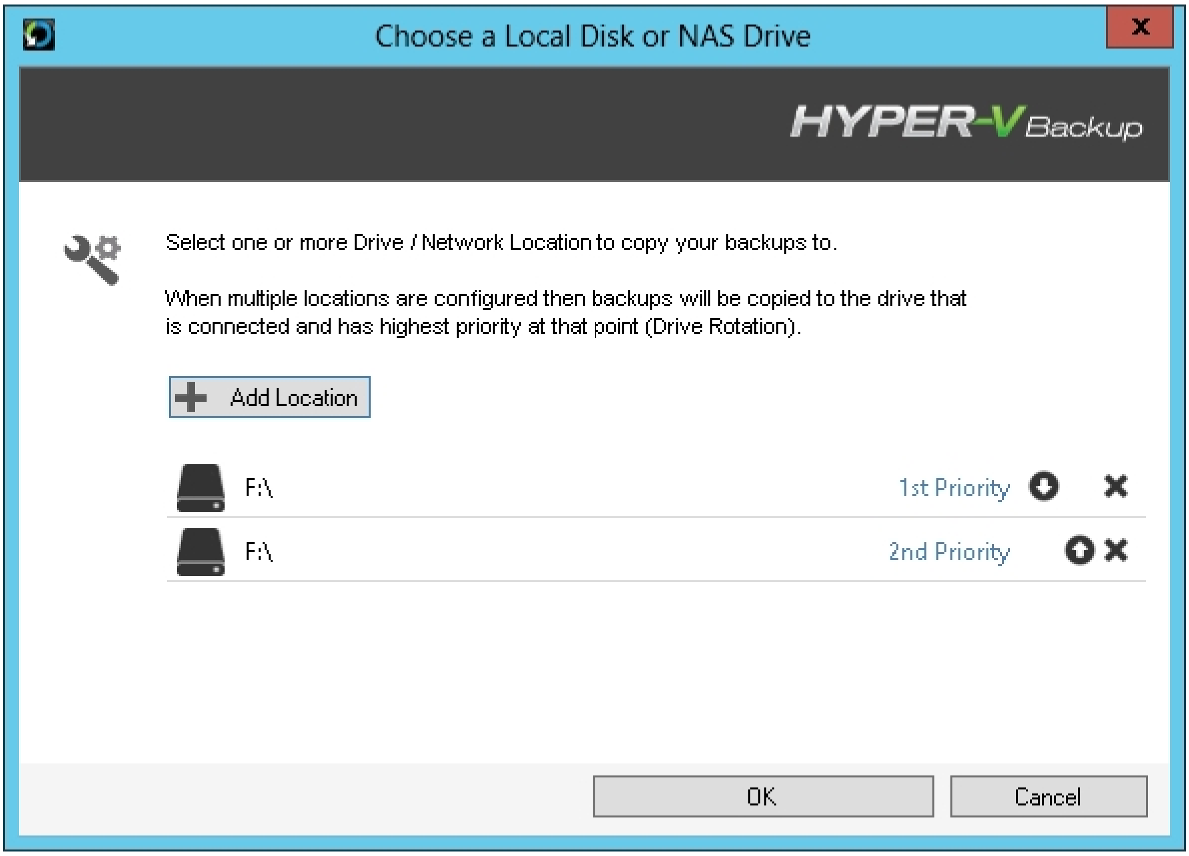
Local Disks

□	C: (Untitled Drive)	66.3 GB Free	NTFS
□	D: (New Volume)	168.41 GB Free	NTFS

6. Select the RDX drive and click "**Select Location**" to add the current cartridge to your list of locations

7. **Important:** Repeat this process for each RDX cartridge

8. Once you have added all your RDX cartridges, they will show in the drive selector prompt as follows:



Choose a Local Disk or NAS Drive

Select one or more Drive / Network Location to copy your backups to.

When multiple locations are configured then backups will be copied to the drive that is connected and has highest priority at that point (Drive Rotation).

F:\ 1st Priority

F:\ 2nd Priority

9. Click OK when done.

Please note that you may also add and remove RDX drives at a later stage.

Backup Drives in a Hyper-V Cluster Environment

If you have a Hyper-V cluster set up, Altaro Hyper-V Backup will communicate with other cluster nodes and instruct them to back up any selected VMs to the same backup location.

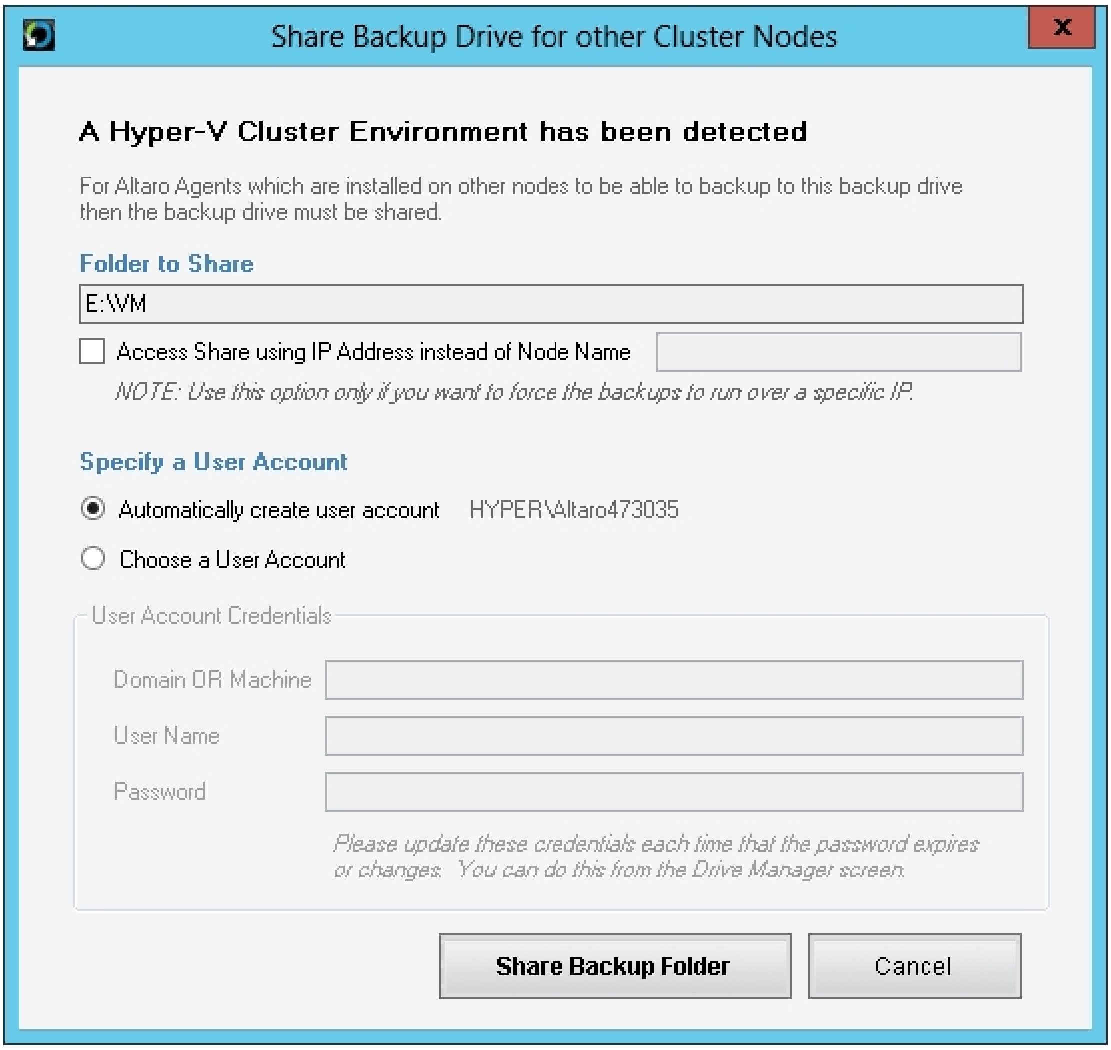
If your primary drive is a network location, the network path credentials are securely communicated to the other cluster nodes so that they can authenticate to and access the backup location.

If on the other hand, your primary drive or drives are locally attached drives such as USB drives etc., then the backup folder on those drives are automatically shared using Windows file sharing, so that the other cluster nodes will have access to the backup location.

When this setup is detected, an extra configuration window is shown after selecting the drive from the Drive Selector window.

A folder called "AltaroSharedFolder" is automatically created at the topmost level of the selected backup location, and this folder is shared using standard Windows File Sharing.

You will be prompted with the following window:



Share Backup Drive for other Cluster Nodes

A Hyper-V Cluster Environment has been detected

For Altaro Agents which are installed on other nodes to be able to backup to this backup drive then the backup drive must be shared.

Folder to Share

E:\VM

□ Access Share using IP Address instead of Node Name

NOTE: Use this option only if you want to force the backups to run over a specific IP.

Specify a User Account

● Automatically create user account HYPER\Altaro473035

○ Choose a User Account

User Account Credentials

Domain OR Machine

User Name

Password

Please update these credentials each time that the password expires or changes. You can do this from the Drive Manager screen.

At the bottom, there is a section titled "Specify a User Account". This refers to the Active Directory Domain User that will have access (both Share access and NTFS security permissions) to the newly created share.

As shown in the image above, you can simply leave it in the hands of Altaro Hyper-V Backup to create a special Active Directory Domain User for this purpose (Altaro070948 in the example above).

The created share will be accessible only by this user, and the randomly generated credentials will be securely communicated to the other Hyper-V nodes when backup is required on another node.

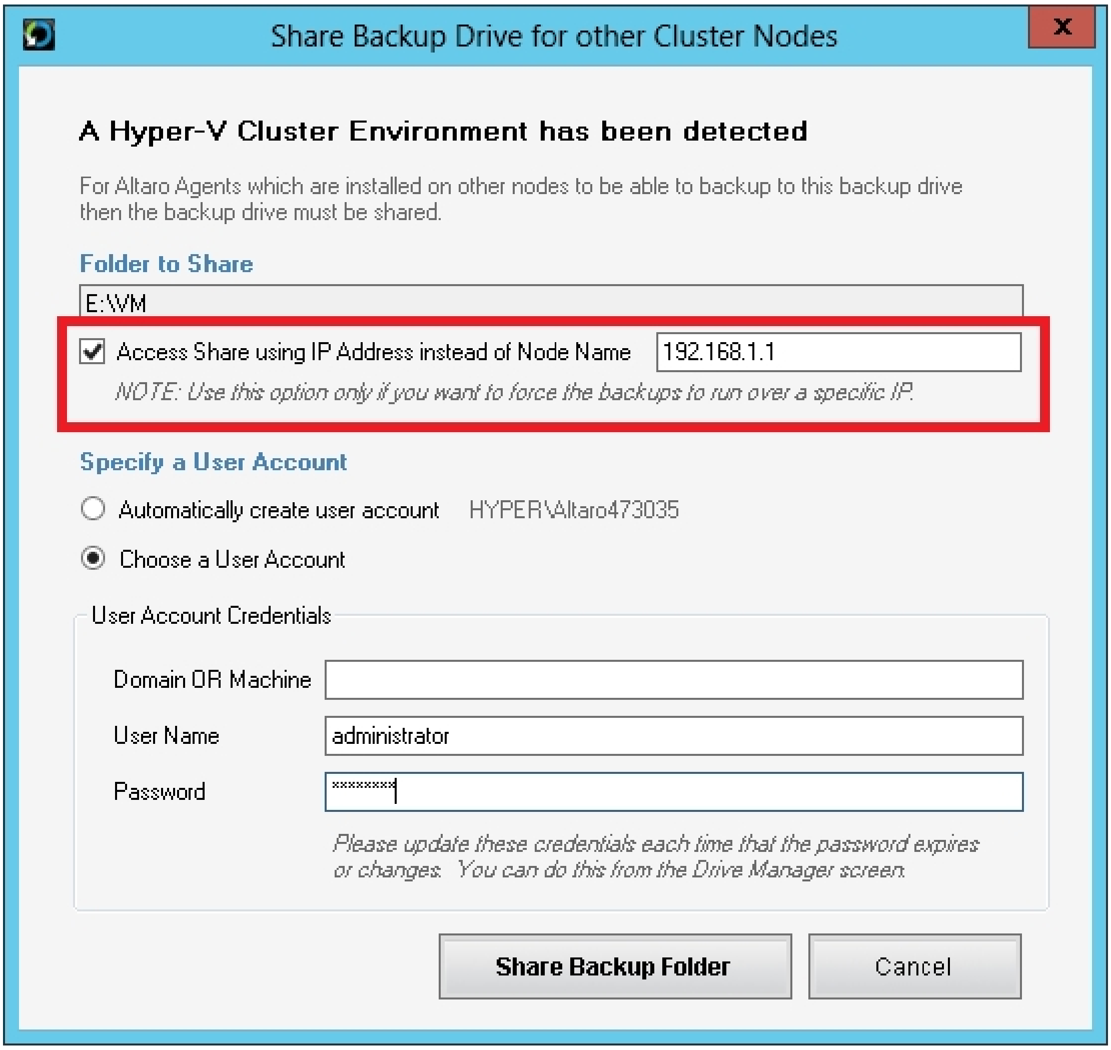
The newly created share will only be accessible by the newly created user.

If you prefer to specify an already existing user, you may click the "Choose a User Account" radio button and specify the credentials as shown in the image below:

Other settings – Specifying a preferred IP:

With Hyper-V cluster setups, the cluster nodes may be connected to a Gigabit or faster network, typically fibre channel, on which the Cluster Shared Volumes are set up. This is usually independent of the standard domain network (the management network), which may not reach the same speeds.

What this means is that a remote cluster node may reach the shared backup drive using one of two networks, one possibly being much faster than the other. If you would like to specify which IP the remote cluster node should use in order to access the locally connected backup drive, you may select the checkbox shown in the image below and specify the required IP.



Share Backup Drive for other Cluster Nodes

A Hyper-V Cluster Environment has been detected

For Altaro Agents which are installed on other nodes to be able to backup to this backup drive then the backup drive must be shared.

Folder to Share

E:\VM

☑ Access Share using IP Address instead of Node Name: 192.168.1.1

NOTE: Use this option only if you want to force the backups to run over a specific IP.

Specify a User Account

○ Automatically create user account HYPER\Altaro473035

● Choose a User Account

User Account Credentials

Domain OR Machine:

User Name: administrator

Password: ********

Please update these credentials each time that the password expires or changes. You can do this from the Drive Manager screen.

If you do not specify this setting, the IP address of the current node (on which the backup drive is shared) will be resolved using the node name on the remote cluster node.

Managing Backup Space

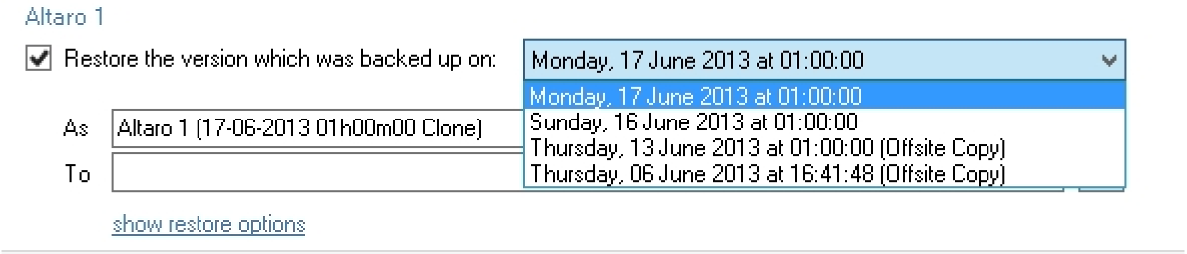
- Limiting the age of older versions (Automatic Backup Retention operations)
- Manually deleting older versions (Manual Backup Retention operations)
- Delete Backups of VMs that have been removed from your Backup Plan

Limiting the age / size of Older Versions (Automatic Maintenance)

During each backup Altaro Hyper-V Backup stores the **latest version** of all files as a complete mirror copy. In fact, the backup destination may be accessed simply through Windows explorer and the latest backup may be browsed manually.

Whenever a file changes (or is deleted) from the source data, the older version (or deleted file) is then moved to the "old versions" repository. Over time this "old versions" repository will continue to grow as files keep on changing and more versions are stored. Altaro's **ReverseDelta** technology compresses older files to reflect only changes between one version and another, while still leaving the latest version as a full copy. This ensures that minimal space is required for the "old versions' repository. (See the section about ReverseDelta in this manual).

As shown in the image below, the Restore Console shows the backup history allowing you to choose which version to restore:



Altaro 1

☑ Restore the version which was backed up on: Monday, 17 June 2013 at 01:00:00

Monday, 17 June 2013 at 01:00:00
Sunday, 16 June 2013 at 01:00:00
Thursday, 13 June 2013 at 01:00:00 (Offsite Copy)
Thursday, 06 June 2013 at 16:41:48 (Offsite Copy)

As: Altaro 1 (17-06-2013 01h00m00 Clone)

To:

Altaro Hyper-V Backup gives you the possibility of restoring a Hyper-V Guest VM to the exact state it was at the specified timestamp.

Each version contributes to the size of the total backup set on the backup drive. This increase in size is dependent on the nature of the changes that occurred between that backup and the previous one. The way Altaro Hyper-V Backup controls the increase in size is by referencing unchanged files across snapshots to the same data on the disk, and also by making use of delta technology in order to store only the changes within a file from one backup to the next.

Old versions may be deleted from the backup set, with the limitation that versions **can only be deleted contiguously starting from the oldest available version**.

Some users may want to perform periodic maintenance their "old versions" repository to ensure that it does not exceed a certain size limit or contain old and obsolete versions. There is one ways to limit the backup size in Altaro Hyper-V Backup:

- Limit the **age** of the oldest file versions that are stored on the backup drive.

This can be taken care of automatically by setting a Backup Retention Policy. You can learn on how to do this by reading this section.

Retention by Age:

Drag and Drop VMs into the appropriate Retention Groups to define how long the older versions of a VM will be kept for.

As an example, let's assume today's date is the 15th January 2013 and I set my age limit to 2 months. This would mean that any backups older than the 15th November 2012 will be deleted from the backup drive. This does not happen immediately, but will be done by a retention operation routine run at the end of each backup job.

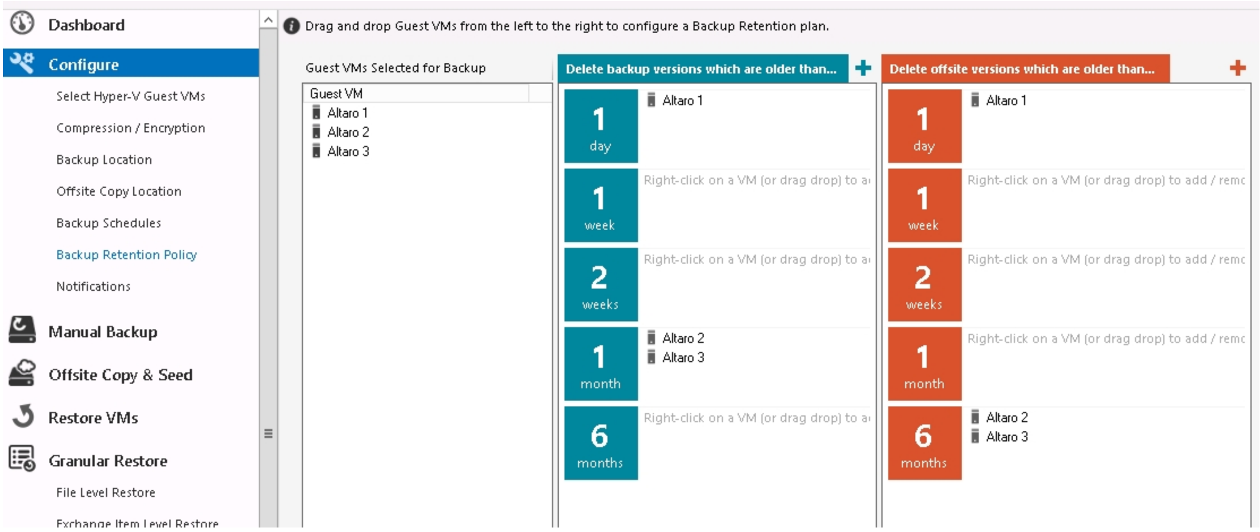
The latest version of each file will never be deleted even if the size limit remains exceeded after all the older versions are deleted. The latest backup must perfectly mirror the source data, and deleting any files from the latest backup would of course result in an incomplete backup. It is up to the user to select a backup destination that can hold at least one version of each VM.

In the example screen below:

Backup versions older than 1 day of the VM called "Altaro1" will be automatically deleted. Offsite copies of this VM older than 1 day will also be automatically deleted.

Backup versions older than 1 month of the VMs called "Altaro2" and "Altaro3" will be automatically deleted. Offsite copies of these VMs older than 6 months will be automatically deleted.

The automatic deletion will occur at the end of every backup job.



Drag and drop Guest VMs from the left to the right to configure a Backup Retention plan.

Guest VMs Selected for Backup

Guest VM
Altaro 1
Altaro 2
Altaro 3

Delete backup versions which are older than...

1 day: Altaro 1
1 week: Right-click on a VM (or drag drop) to a
2 weeks: Right-click on a VM (or drag drop) to a
1 month: Altaro 2, Altaro 3
6 months: Right-click on a VM (or drag drop) to a

Delete offsite versions which are older than...

1 day: Altaro 1
1 week: Right-click on a VM (or drag drop) to add / remo
2 weeks: Right-click on a VM (or drag drop) to add / remo
1 month: Right-click on a VM (or drag drop) to add / remo
6 months: Altaro 2, Altaro 3

<u>Common Questions:</u>

Will backup retention ever delete all versions of a backed up file?

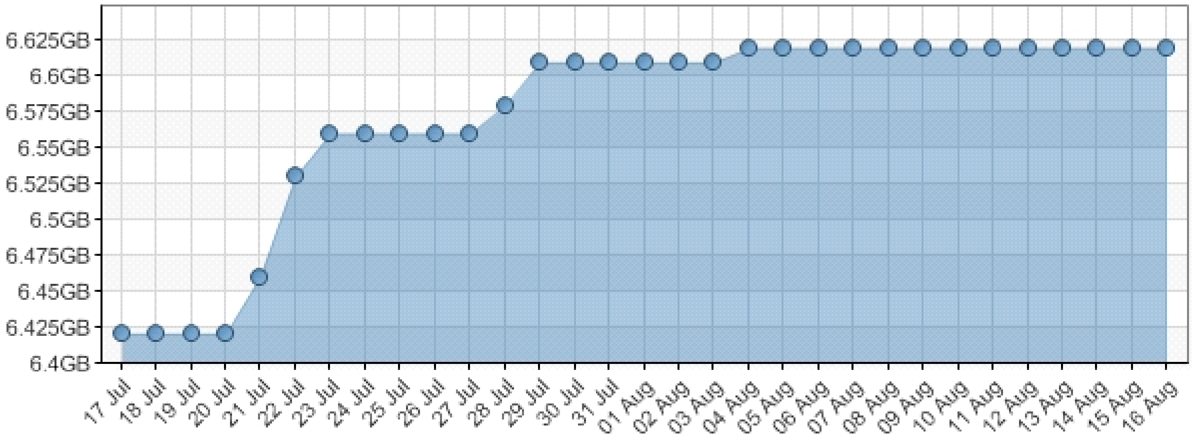
The retention operations will never delete all versions of a file, unless a file had been deleted from your Server for a period longer than the retention period set. Therefore using the same example, you have chosen to delete all versions older than two months and a particular file was deleted from your Server say three months ago.

Since that file was not present at any of the points in time displayed on the timeline then the file can no longer be restored by Altaro Hyper-V Backup from the Restore Console.

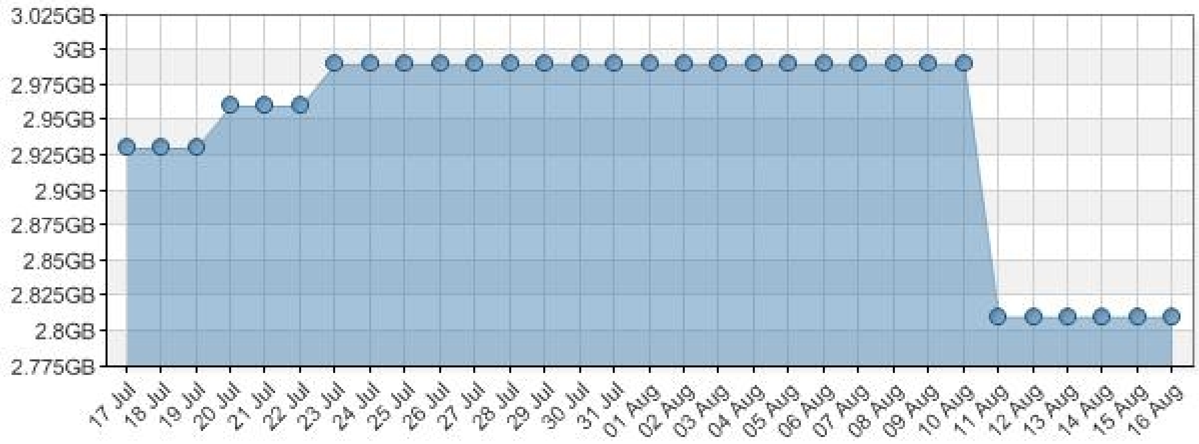
What is the end result of backup retention being activated?

The result of all of the above is that, assuming that the changes to your data are more or less similar between one backup and another, this will result in the backup size levelling off as shown in the image below.

This is because as one backup is added to the stack on the timeline, an older one is deleted, **so your backup window is always the same age or size**, moving forwards one day at a time. This levelling off is of course only seen when the oldest backup hits the limit set by the retention policy.



Please note that if you have no Retention Policy for quite a while, and then set the cut-off point to a point in time that is considerably "younger" than your oldest backup, you will see a dip in the size as shown in the graph below, as several backups in the timeline are purged simultaneously. You should then start seeing some levelling off in size thereafter.



Remember that the levelling off assumes that daily changes are fairly similar. If you add substantial amounts of data then you will still see an increase in the size of the graph. With regards to the renaming of folders, deleting of files etc. the files will remain in the backup history until they are flushed out by the retention policy.

How do I find the right setting for my Retention Policy?

Sometimes, trial and error is required to find the right balance between available disk space and age of versions to keep. Here at Altaro, we recommend that if drive space on your backup drive becomes an issue, start with a high setting, which is just below the age of your oldest backup. For example, if you have versions going back 3 months set the setting at 2 months. Next wait until your backup size is maintained and you see a dip in size in the graph.

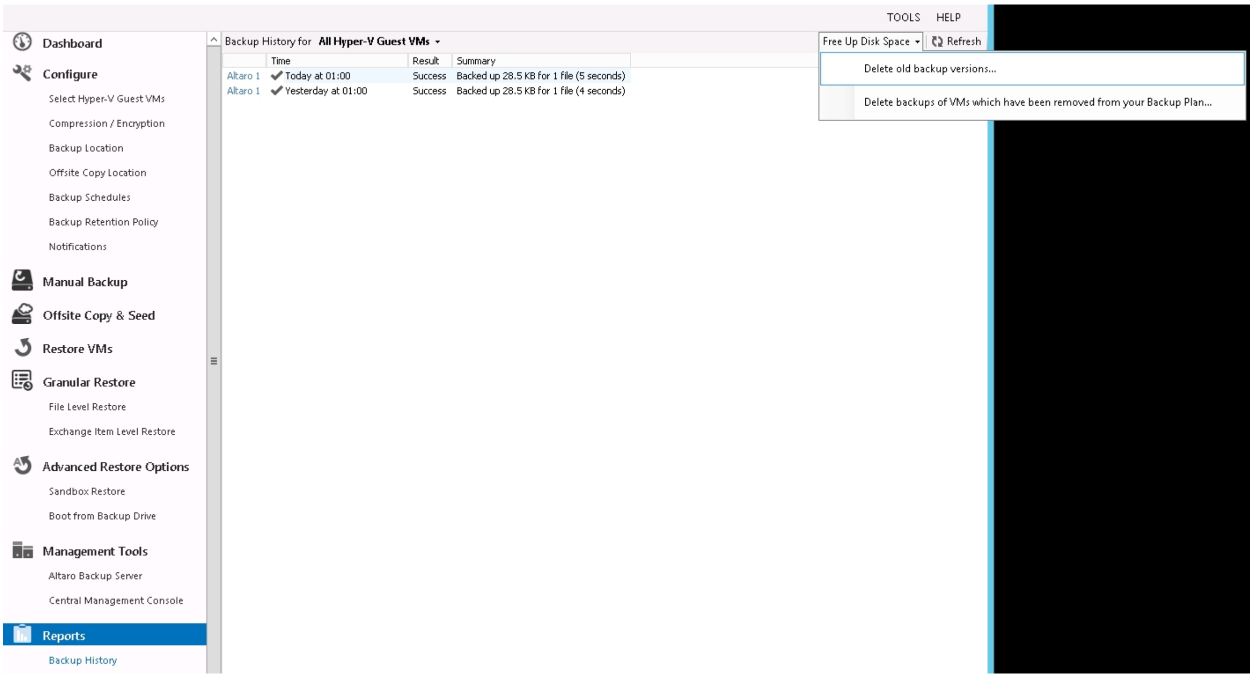
If after a few days you realize that drive space is still an issue, set the Retention Policy to a shorter time-window, and keep going until you achieve the desired balance.

Manually deleting older versions in the backup set (Manual Maintenance)

The **Altaro Hyper-V Backup Drive space manager** is a simple utility that can be used to clear out old versions from your backup drive. This utility will free up disk space and will also be presented to the user in the case that their backup drive is full or will soon be full.

To access the utility:

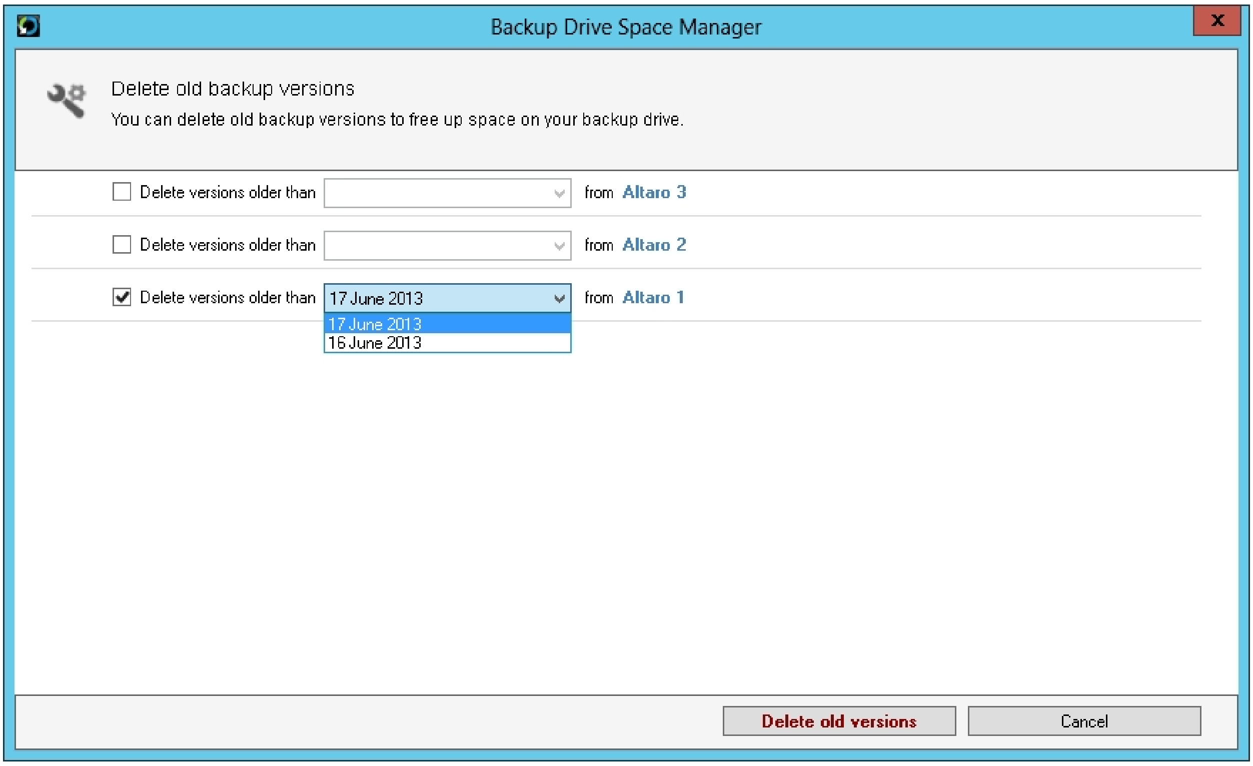
1. Open the Altaro Backup Hyper-V Management Console. (Instructions here)
2. Click on the **Reports** menu on the left hand side of the screen.
3. Choose the "**Backup History**" report.
4. Click on "**Free Up Disk space**" from the top right of the report, then click "**Delete old backup versions...**"



Backup History for **All Hyper-V Guest VMs**

	Time	Result	Summary
Altaro 1	✓ Today at 01:00	Success	Backed up 28.5 KB for 1 file (5 seconds)
Altaro 1	✓ Yesterday at 01:00	Success	Backed up 28.5 KB for 1 file (4 seconds)

You will now be presented with the following screen:


Backup Drive Space Manager

Delete old backup versions

You can delete old backup versions to free up space on your backup drive.

□ Delete versions older than [ ] from **Altaro 3**

□ Delete versions older than [ ] from **Altaro 2**

☑ Delete versions older than [17 June 2013] from **Altaro 1**

To delete old versions:

1. Choose the checkboxes to indicate on which VMs you would like to delete older versions of.
2. From the drop down lists select a "delete if older than" date, which may be independent for each VM. Versions which were created at a time which is older than the selected date will be marked for deletion.
3. Click on "Delete Old Versions".

4. You will now be presented with a progress bar which will indicate when the selected old versions have been deleted.

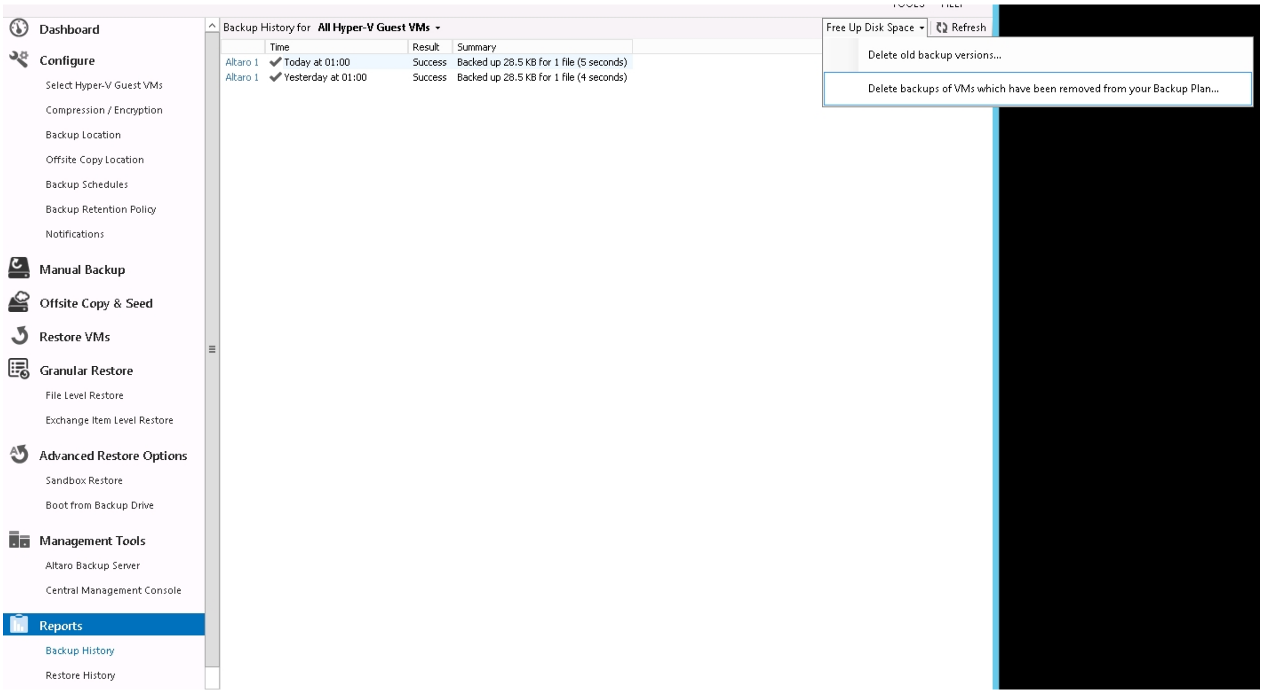
Please keep in mind that the graphs show the maximum size that existed on any one particular day, so the change in size may not be visible immediately on the dashboard.

Delete Backups of VMs that have been removed from your Backup Plan

When you remove a VM from your Backup Plan (using the VM Browser as explained here) the backup folder containing that VMs backup files is not deleted. This is intentional to allow users to reselect the VM and restore previous versions at a later date. There may be cases where the user is no longer interested in keeping the old backup folders and would like to free up space on the backup drive.

This utility will facilitate deletion of old backup folder. Please note that once a backup folder is deleted then you will not be able to restore that VM until it is backed up again.

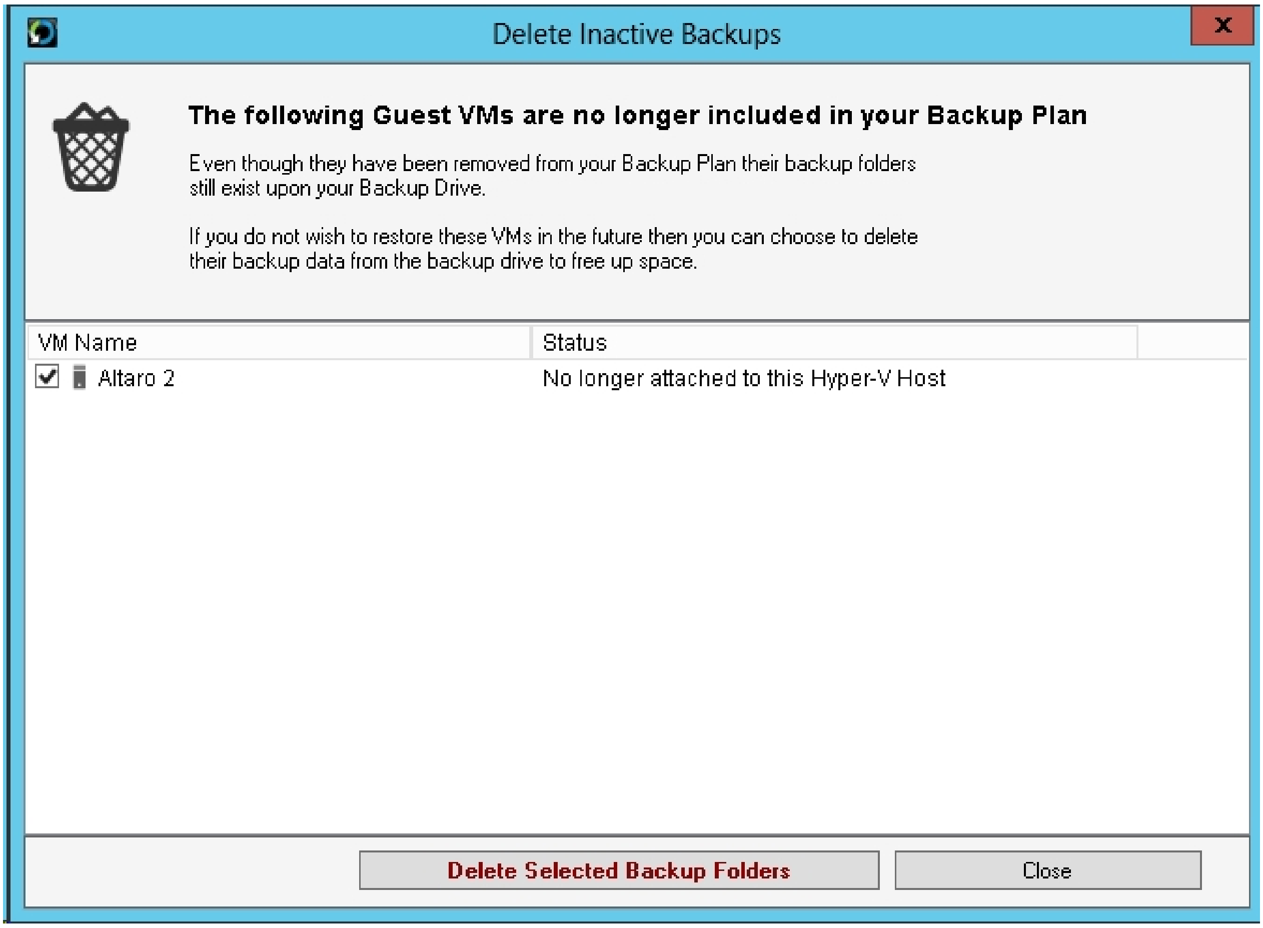
1. You can access this feature from the Backup History Report as shown in the next screenshot.



Backup History for **All Hyper-V Guest VMs**

	Time	Result	Summary
Altaro 1	✓ Today at 01:00	Success	Backed up 28.5 KB for 1 file (5 seconds)
Altaro 1	✓ Yesterday at 01:00	Success	Backed up 28.5 KB for 1 file (4 seconds)

2. Once launched the utility will list all VMs for which a backup folder exists on the backup drive, but the VM is no longer being backed up.



Delete Inactive Backups

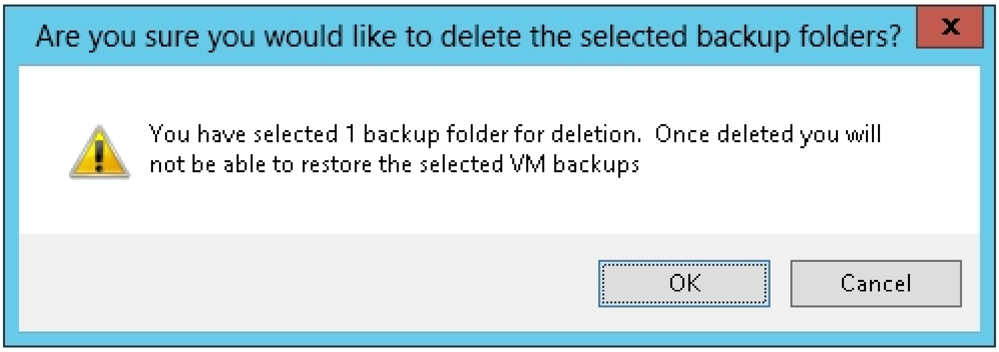
The following Guest VMs are no longer included in your Backup Plan

Even though they have been removed from your Backup Plan their backup folders still exist upon your Backup Drive.

If you do not wish to restore these VMs in the future then you can choose to delete their backup data from the backup drive to free up space.

VM Name	Status
☑ Altaro 2	No longer attached to this Hyper-V Host

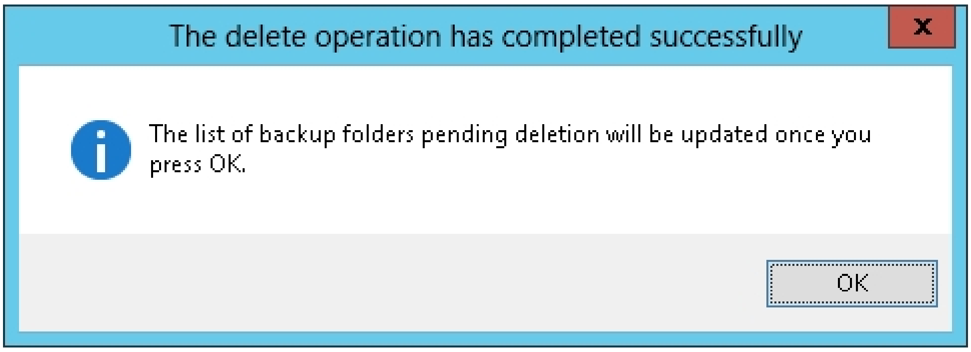
3. You may use the check boxes to select one or more backup folders to delete. Once the selections are made then you can simply click on "Delete Selected Backup Folders". You will be prompted for confirmation before the deletion starts.



Are you sure you would like to delete the selected backup folders?

You have selected 1 backup folder for deletion. Once deleted you will not be able to restore the selected VM backups

4. Once deletion is complete you will be notified and the list of VM Backups pending deletion will be updated.



The delete operation has completed successfully

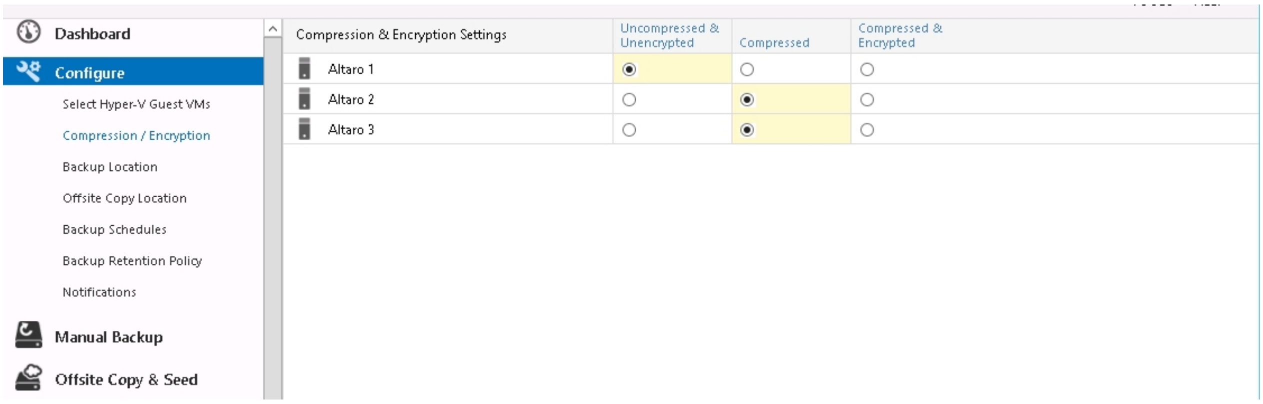
The list of backup folders pending deletion will be updated once you press OK.

Compression / Encryption

Enabling Backup Compression / Encryption

Altaro Hyper-V Backup offers the option for compressing your backup data before it is written to the backup drive.

To enable Compression, open the Altaro Hyper-V Backup Management Console and go to "**Configure >> Compression / Encryption"** as shown below

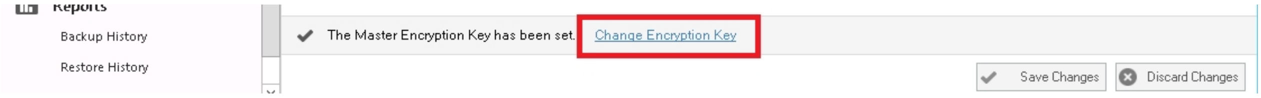


Compression & Encryption Settings	Uncompressed & Unencrypted	Compressed	Compressed & Encrypted
Altaro 1	●	○	○
Altaro 2	○	●	○
Altaro 3	○	●	○

Here, you will see a list of your VMs where you can toggle between:

- **Uncompressed & Unencrypted** - No compression or encryption will be applied to your backups.
- **Compressed** - Backup data will be compressed, but not encrypted.
- **Compressed & Encrypted** - Backup data will be both compressed and encrypted with AES Military grade encryption. (This option is required if backing up to an offsite server)

If you wish to enable Encryption, you will need to set an Encryption Key.
To do so you can click the '**Change Encryption Key**' link at the bottom of the page.



✓ The Master Encryption Key has been set. Change Encryption Key

Once you have chosen the settings you desire for each of your VMs and set your encryption key if necessary, click **Save Changes** to complete

Offsite Backups

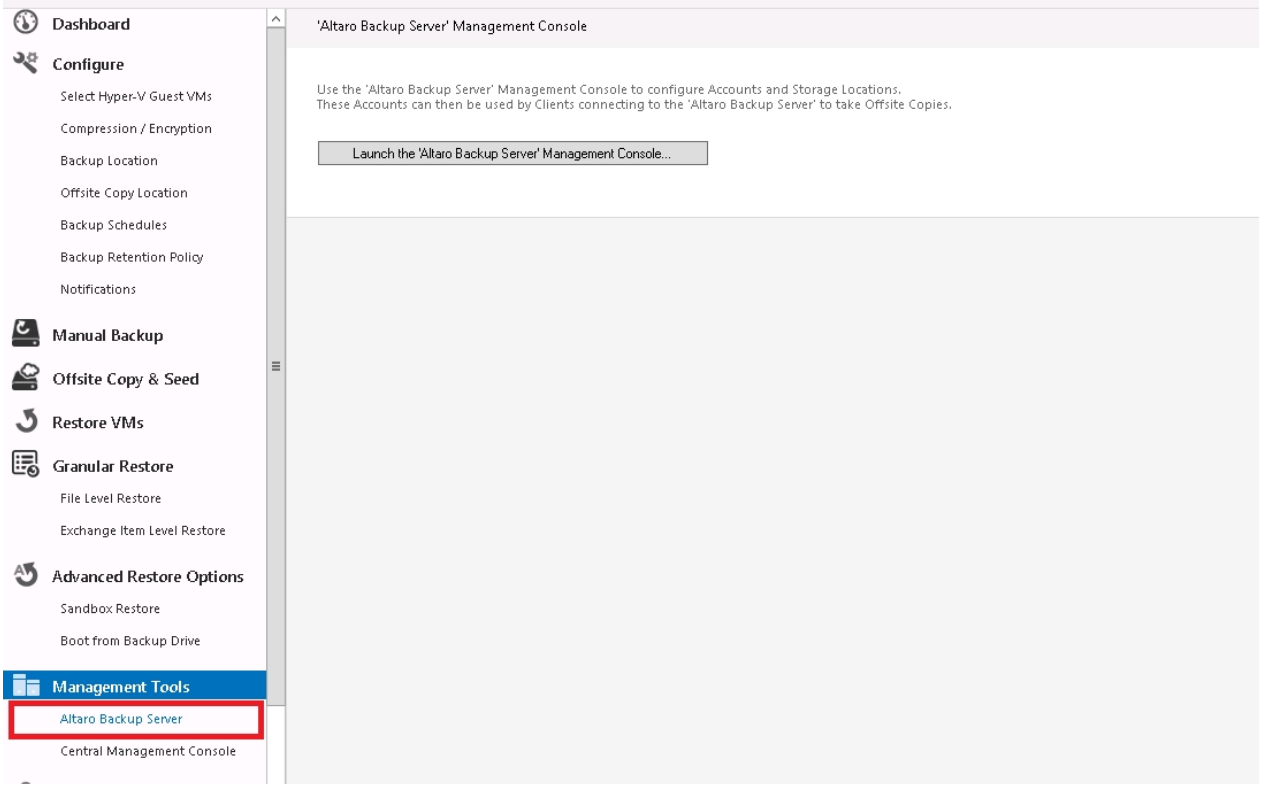
Setting up an Altaro Backup Server

The introduction of an Altaro Backup Server role means that you can install the Altaro Backup Server application on another server, and use that server as a backup target for your offsite backup copy.

Important: TCP Ports **35101 - 35105** are used for communication between the Altaro Hyper-V Backup software and the Altaro Backup Server and **must** be allowed through.

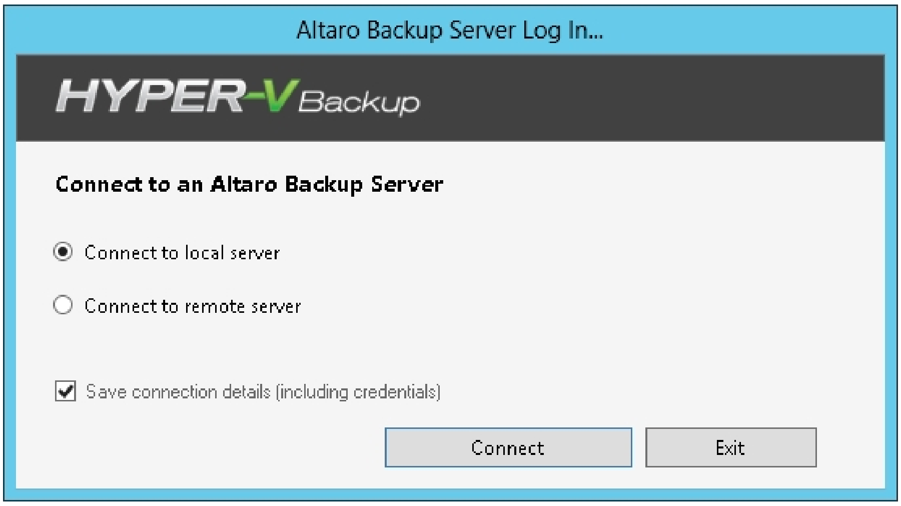
To install and configure the Altaro Backup Server, download and run the installer from here: http://www.altaro.com/hyper-v-backup/download-tools.php

Once installed, launch the "Altaro Backup Server" application from the **Management Tools** section of the Altaro Console as shown below:



Use the 'Altaro Backup Server' Management Console to configure Accounts and Storage Locations.
These Accounts can then be used by Clients connecting to the 'Altaro Backup Server' to take Offsite Copies.

You will then be prompted with this screen:



Altaro Backup Server Log In...

Connect to an Altaro Backup Server

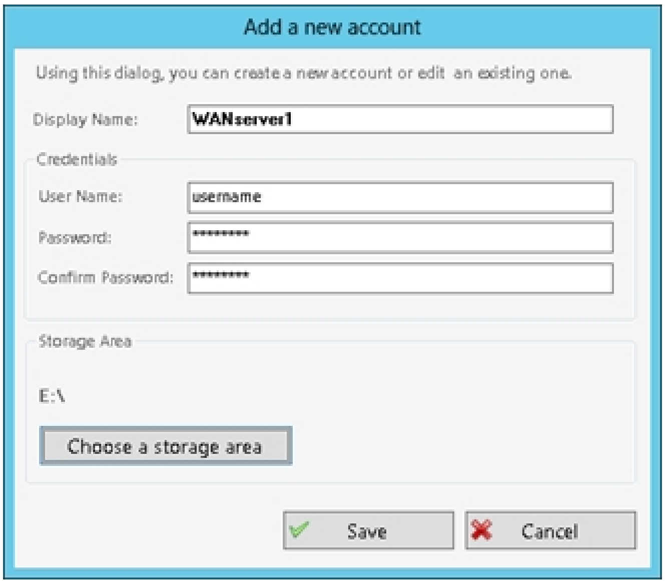
● Connect to local server

○ Connect to remote server

☑ Save connection details (including credentials)

Here choose to connect to the local server, which will then allow you to monitor/configure your remote backup server.

Here, click Configure Accounts, and then “Add a new account” to setup the connection details for this remote backup server as shown below.



Add a new account

Using this dialog, you can create a new account or edit an existing one.

Display Name: WANserver1

Credentials

User Name: username

Password: *********

Confirm Password: *********

Storage Area

E:\

Set the storage area and credentials you prefer and click Save.

You can also monitor backups from the Dashboard section, which will show you current activity, backup/ restore history and events.

Configuring the Altaro Backup Server as your Offsite Backup location

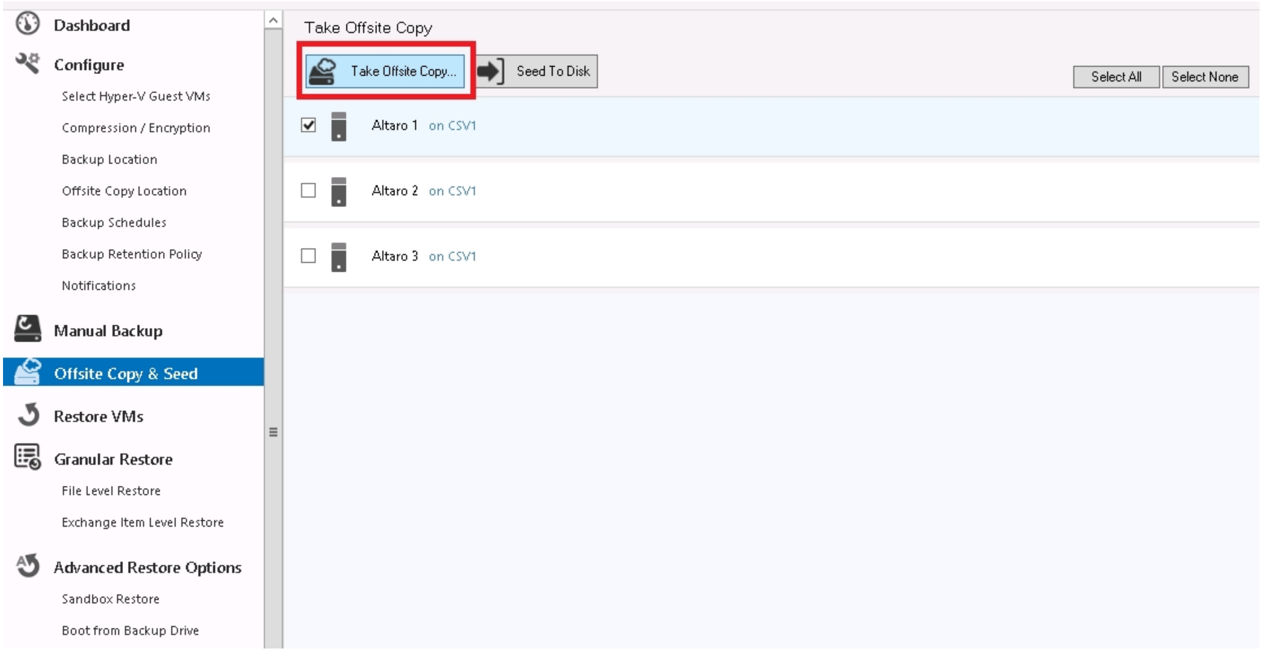
After you have configured an Altaro Backup Server, you will need to configure the main Altaro Hyper-V Backup application to back up to that server.

To do this, follow the instructions here to configure the ‘Offsite Copy Location” to point to your Altaro Backup server

Manually taking an Offsite Copy

To manually start an Offsite copy, please proceed as follows:

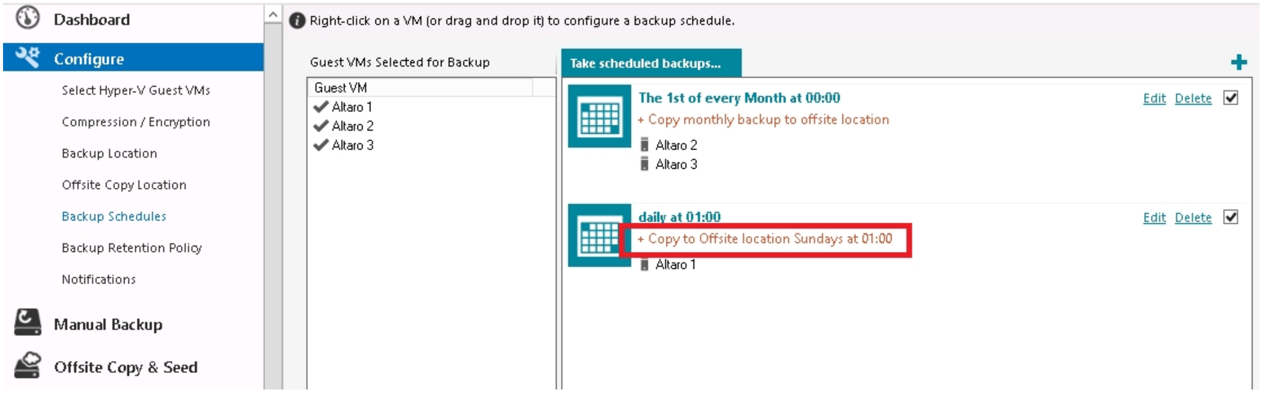
- Go to the **'Offsite Copy & Seed'** section
- Select the VM(s) you wish to start an offsite copy of
- Click the **'Take Offsite Copy'** button at the top of the screen as shown below:



Scheduling an Offsite Copy

To schedule Offsite Copies, please proceed as follows:

- Open the Altaro Management Console
- Go to Configure >> Backup Schedules
- Create a schedule group specifying the date and time for your Offsite copies, more details here.
- The schedule of your offsite copies will be shown in orange text in the summary of each schedule group, as below:



Right-click on a VM (or drag and drop it) to configure a backup schedule.

Guest VMs Selected for Backup

Guest VM
✓ Altaro 1
✓ Altaro 2
✓ Altaro 3

Take scheduled backups...

The 1st of every Month at 00:00
+ Copy monthly backup to offsite location
Altaro 2
Altaro 3

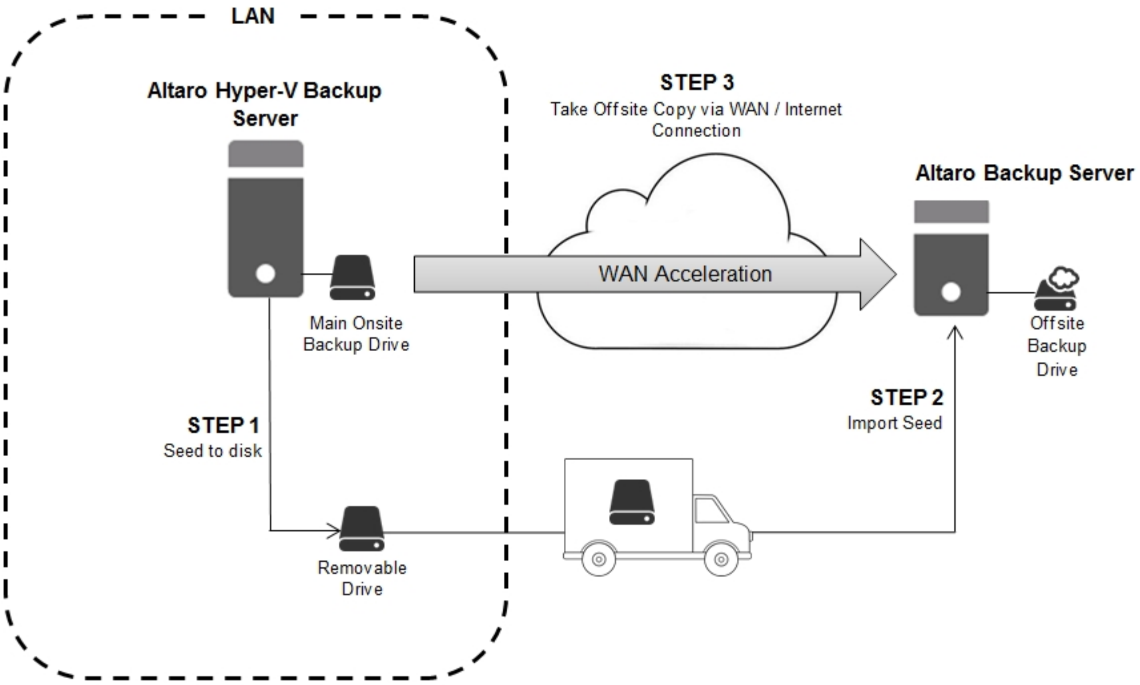
daily at 01:00
+ Copy to Offsite location Sundays at 01:00
Altaro 1

- Drag and drop the VM(s) from the left hand column over to the Schedule group you wish to add them to
- When done, click Save Changes

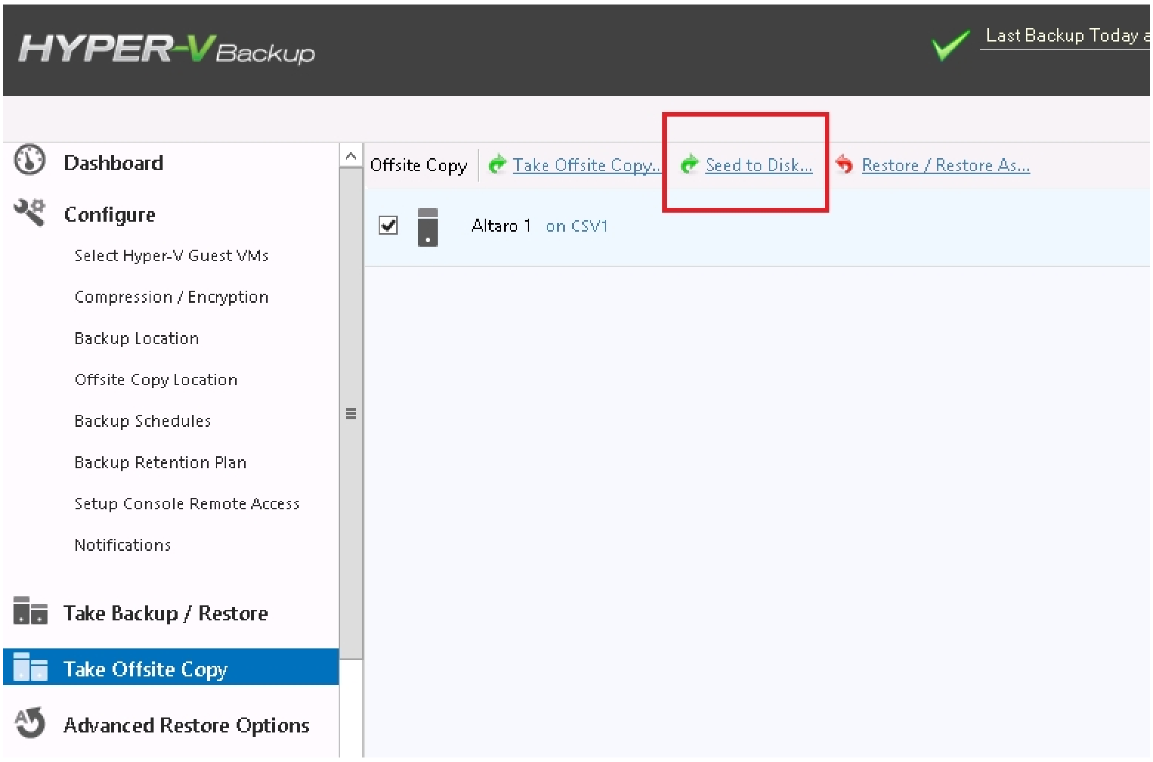
Seeding

When backing up to an Offsite Altaro Backup Server, it's likely that the bandwidth to that server may be limited, so we have introduced the option to manually take the first full backup to the Altaro Backup Server physically, which will then allow you to run only incremental copies over the WAN connection, we call this process *Seeding to disk*.

The below diagram summarizes the Seeding process in 3 steps:



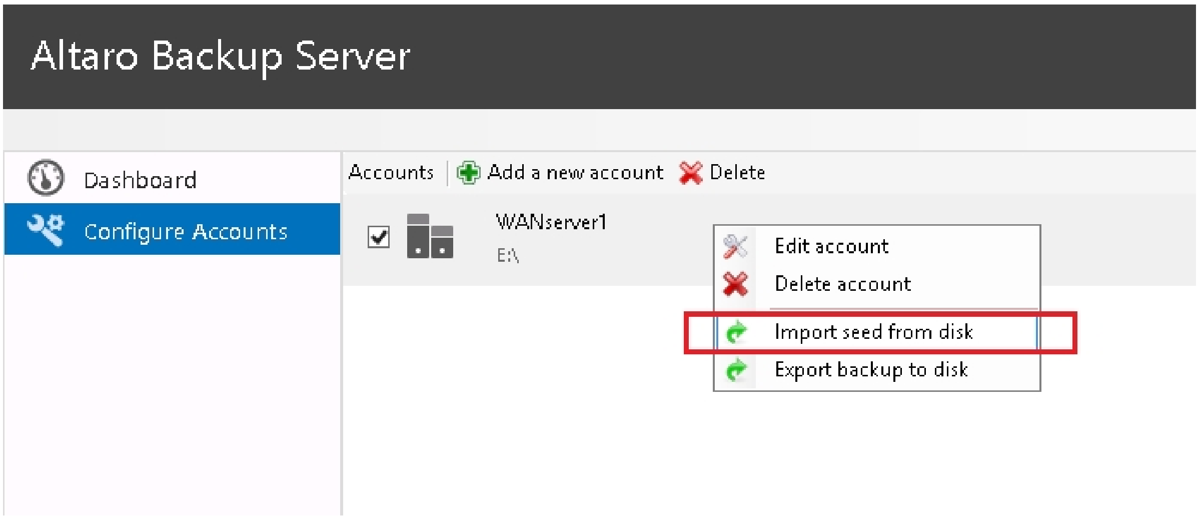
To do this, you will need a removable disk connected to your main Altaro server. Once done, go to the 'Take Offsite Copy' screen, select the VMs you wish to transfer the backups for and click the 'Seed to Disk' link at the top of the page as below:



Here, select the removable drive you wish to seed to, and click "Start seed to disk", and then OK. The seeding will proceed in the background, and when complete you can disconnect the drive and manually take it to your WAN server.

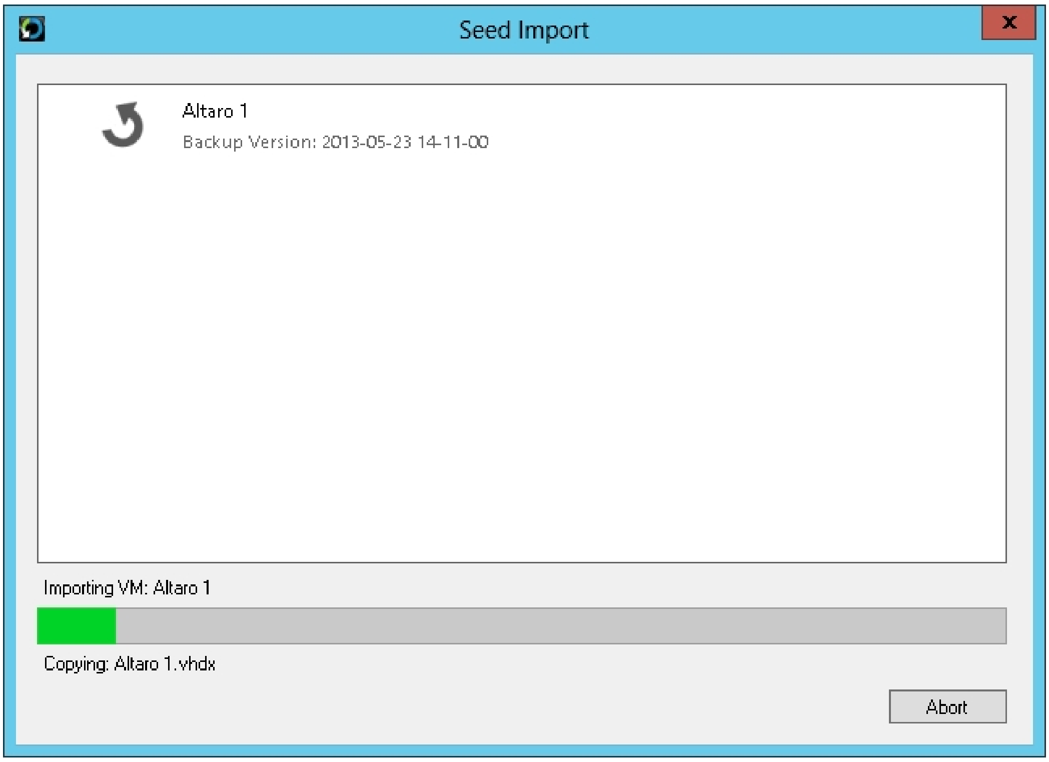
Once the removable disk has been connected to your Altaro Backup Server, launch the Altaro Backup Server console from the Start Menu.

Here, right click your server name and select "Import seed from disk" as shown below:



On the next screen, browse to the removable drive (and subfolder if applicable) where you exported the seed data to, select it and hit Start.

It will begin to import the seed data to the Altaro Backup Server's backup repository and show progress as below:



Altaro 1
Backup Version: 2013-05-23 14-11-00

Importing VM: Altaro 1

Copying: Altaro 1.vhdx

Once complete, any future backups to this Altaro Backup Server will be of incremental changes only.

Altaro Management tools

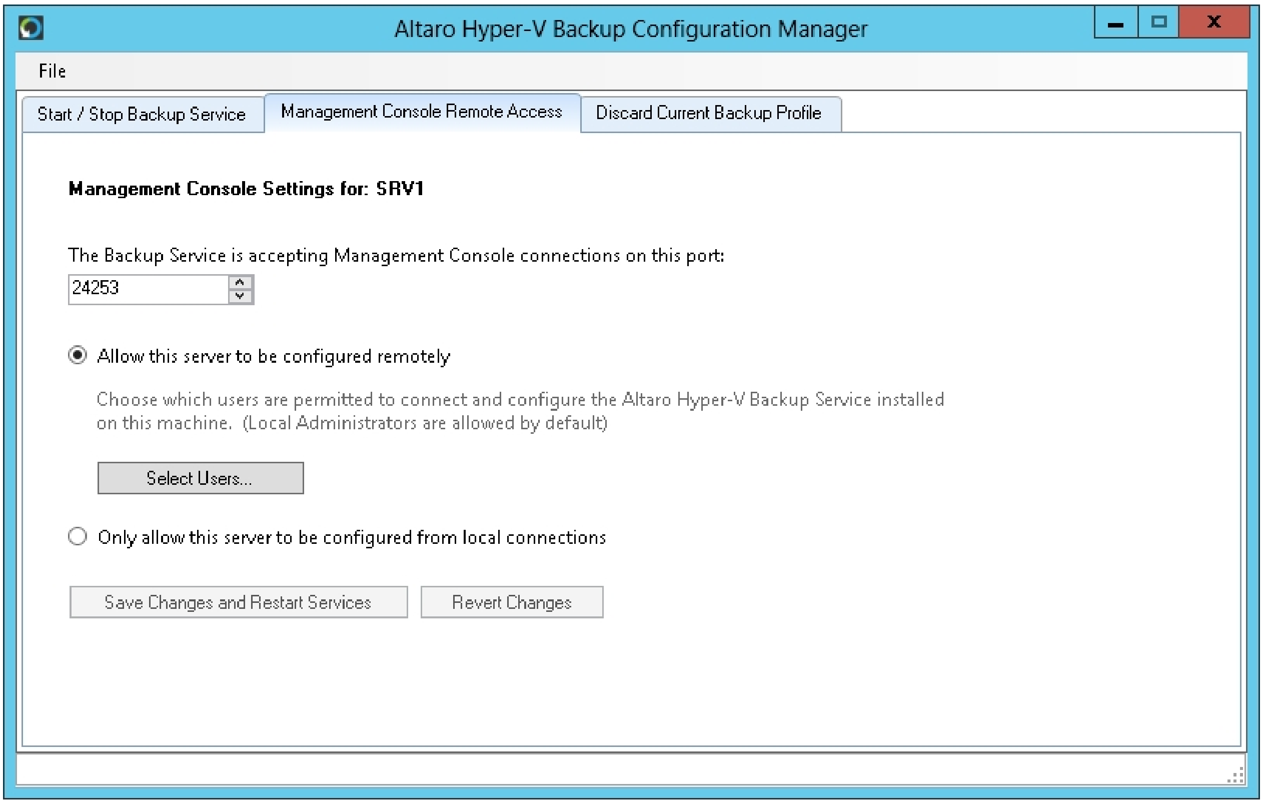
Setting up Console Remote Access to Altaro Hyper-V Backup

The introduction of the remote management console means that you can now install the software on another machine and manage the software from that remote machine.

By default this is already enabled for members of the Domain Administrators group, however should you wish to disable, or restrict remote access to the configuration,

You can use the "Management Console Remote Access" feature in the **Altaro Hyper-V Backup Configuration Manager**. You can learn how to access the Configuration Manager here.

- Once the configuration manager is launched, go to the second tab called **Management Console Remote Access** as shown below:


Altaro Hyper-V Backup Configuration Manager
File
Start / Stop Backup Service
Management Console Remote Access
Discard Current Backup Profile
Select Users...
Save Changes and Restart Services
Revert Changes

Management Console Settings for: SRV1

The Backup Service is accepting Management Console connections on this port:
24253

● Allow this server to be configured remotely

Choose which users are permitted to connect and configure the Altaro Hyper-V Backup Service installed on this machine. (Local Administrators are allowed by default)

○ Only allow this server to be configured from local connections

- Here you can choose to either disable remote access to the console by selecting 'Only allow local Management console connections', or you may choose to restrict access to certain users or groups by clicking the 'Select Users' button.
- Once you have configured as desired, click OK to save the changes.

You are now ready to install the Altaro Management tools on a remote machine and connect to your Altaro Hyper-V Backup console remotely.

Installing the Altaro Management Tools

To install the Remote management console on another machine, you must download and run the installer from here: http://www.altaro.com/hyper-v-backup/download-tools.php

This is only supported on 64-bit OS's, please see the full system requirements here.

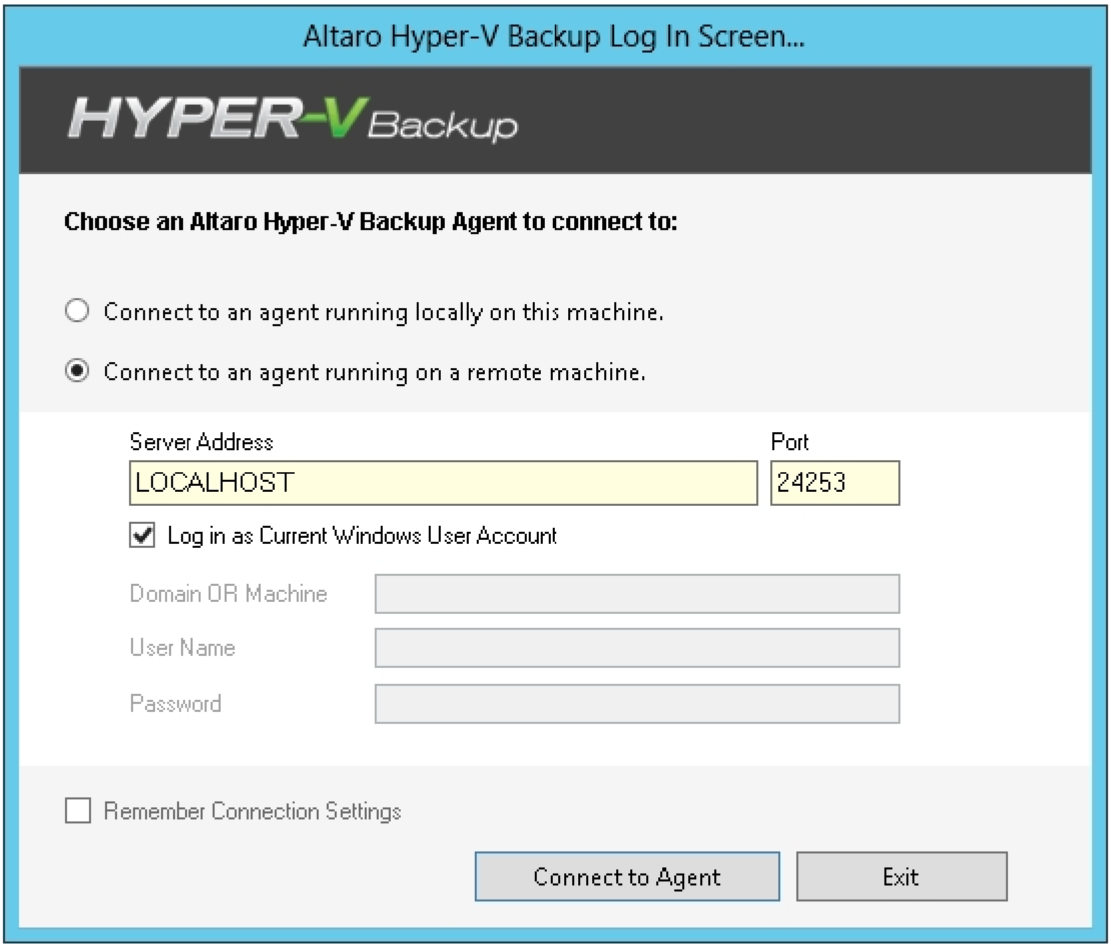
Once the Altaro Management Tools are installed, you will be able to launch the following consoles:

- The Altaro Hyper-V Backup console - used to access the configuration and console of a single remote Altaro Hyper-V Server
- The Altaro Backup Server console - used to access the configuration and console of a single remote Altaro Backup Server
- The Altaro Central Management console - used to monitor the multiple remote Altaro Hyper-V Servers at once, and connect to their management consoles if required.

Using the Remote Hyper-V Backup Console

The Remote Hyper-V Backup console will allow you to connect to the configuration console of a remotely installed Altaro Hyper-V Backup machine.
Please follow the instructions below for use:

1. From the Start Menu launch "Altaro Hyper-V Backup"
2. When the remote console is opened, you will be presented with a choice to connect to a local agent or a remote machine as below:



Altaro Hyper-V Backup Log In Screen...

Choose an Altaro Hyper-V Backup Agent to connect to:

○ Connect to an agent running locally on this machine.

● Connect to an agent running on a remote machine.

Server Address: LOCALHOST
Port: 24253

☑ Log in as Current Windows User Account

Domain OR Machine:
User Name:
Password:

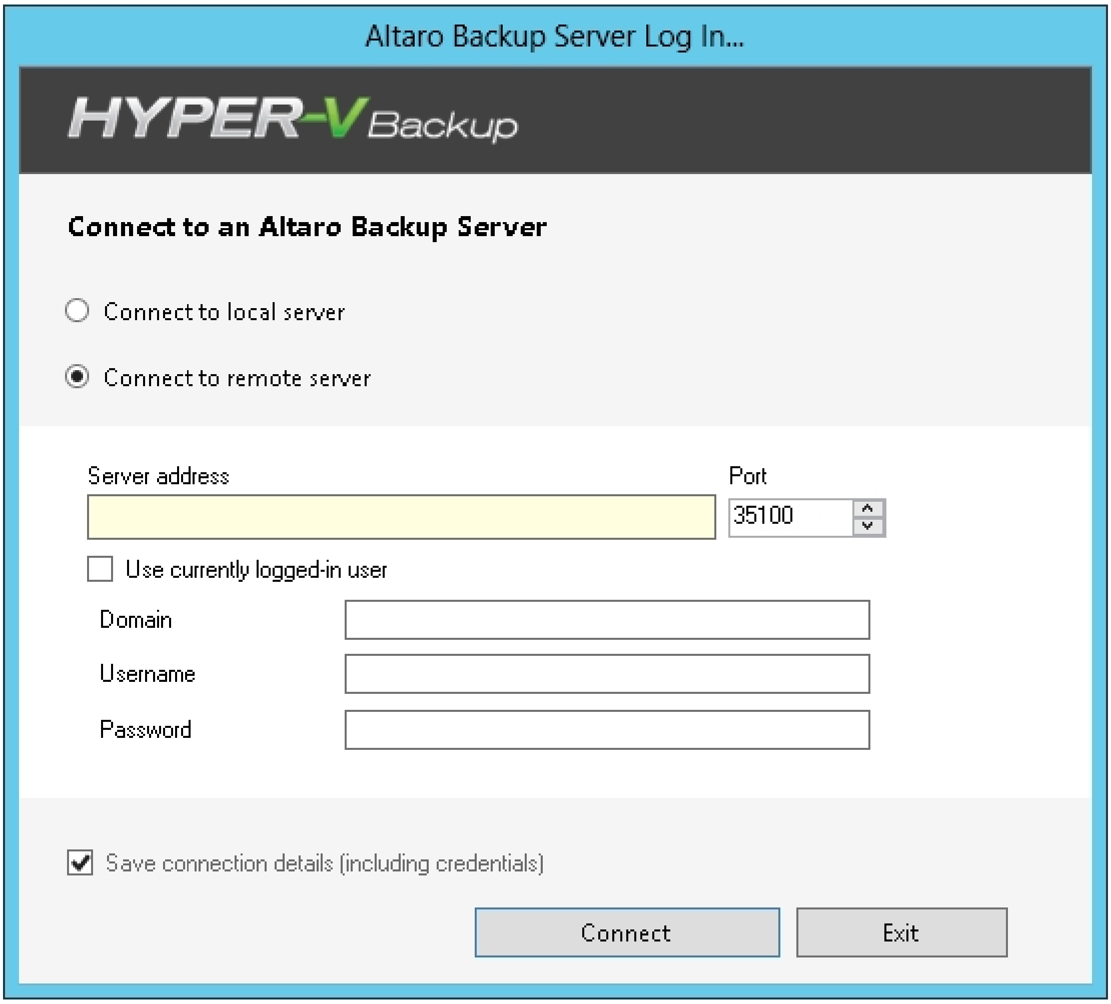
□ Remember Connection Settings

3. Here you can select the second option to connect to a remote Altaro console and manage its configuration.
4. Simply enter the servers IP, port and credentials and click Connect to Agent.
5. Ensure that the credentials you are using to connect have already been allowed in the Altaro Hyper-V Backup configuration as described here.

Using the Backup Server Console

The Remote Backup Server console will allow you to connect to the configuration console of a remotely installed Altaro Backup Server.
Please follow the instructions below for use:

1. From the Start Menu launch "Altaro Backup Server"
2. When the remote console is opened, you will be presented with a choice to connect to a local agent or a remote machine as below:



Altaro Backup Server Log In...

Connect to an Altaro Backup Server

○ Connect to local server

● Connect to remote server

Server address:

Port: 35100

□ Use currently logged-in user

Domain:

Username:

Password:

☑ Save connection details (including credentials)

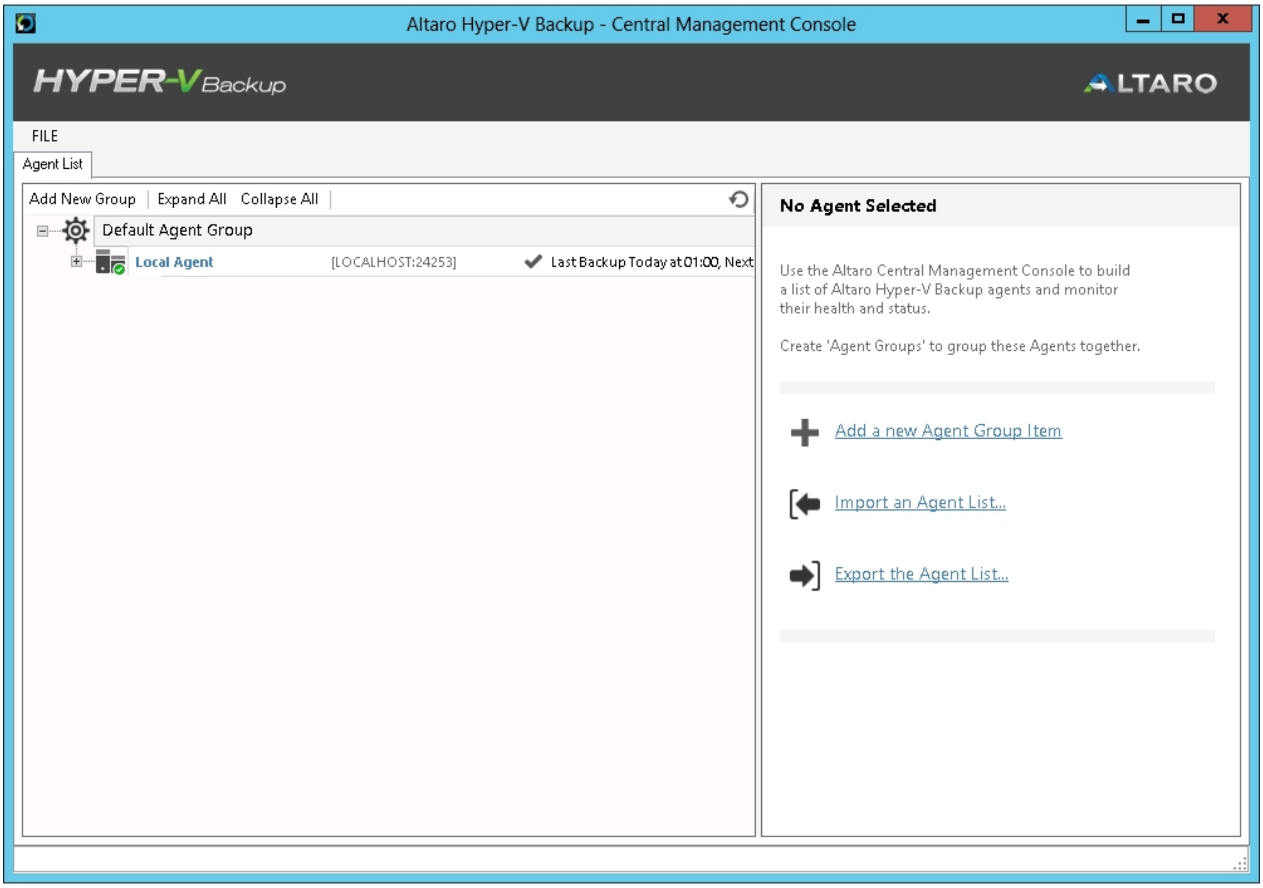
3. Here you can select the second option to connect to a remote Altaro Backup Server console and manage its configuration.
4. Simply enter the servers IP, port and credentials and click Connect.

Using the Central Management Console

The Altaro Central Management console will allow you to monitor multiple remotely installed Altaro Hyper-V Backup machines at once, and connect to their management consoles if required.
Please follow the instructions below for use:

1. From the Start Menu launch "Altaro Central Management Console"

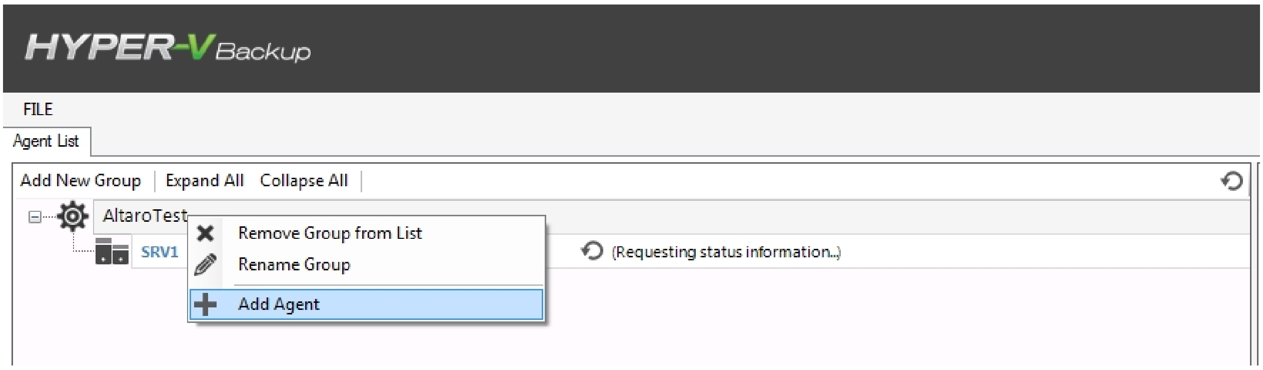
2. When the remote console is opened, you will be presented with a console as below:



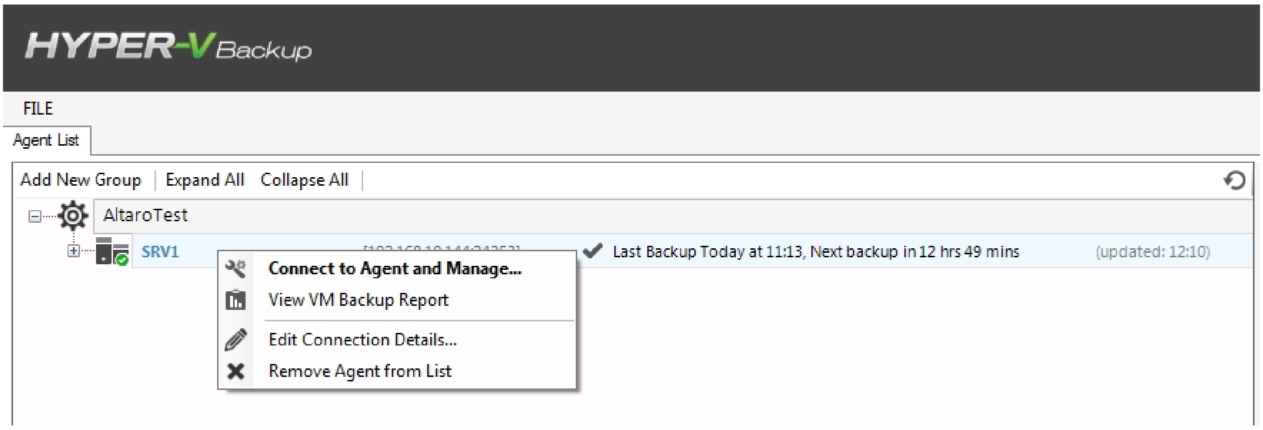
Use the Altaro Central Management Console to build a list of Altaro Hyper-V Backup agents and monitor their health and status.

Create 'Agent Groups' to group these Agents together.

3. Here you will see a list of currently connected agents.
   Right-clicking an Agent group will allow you to Add a new agent to the group, remove the group, or rename it as shown below:

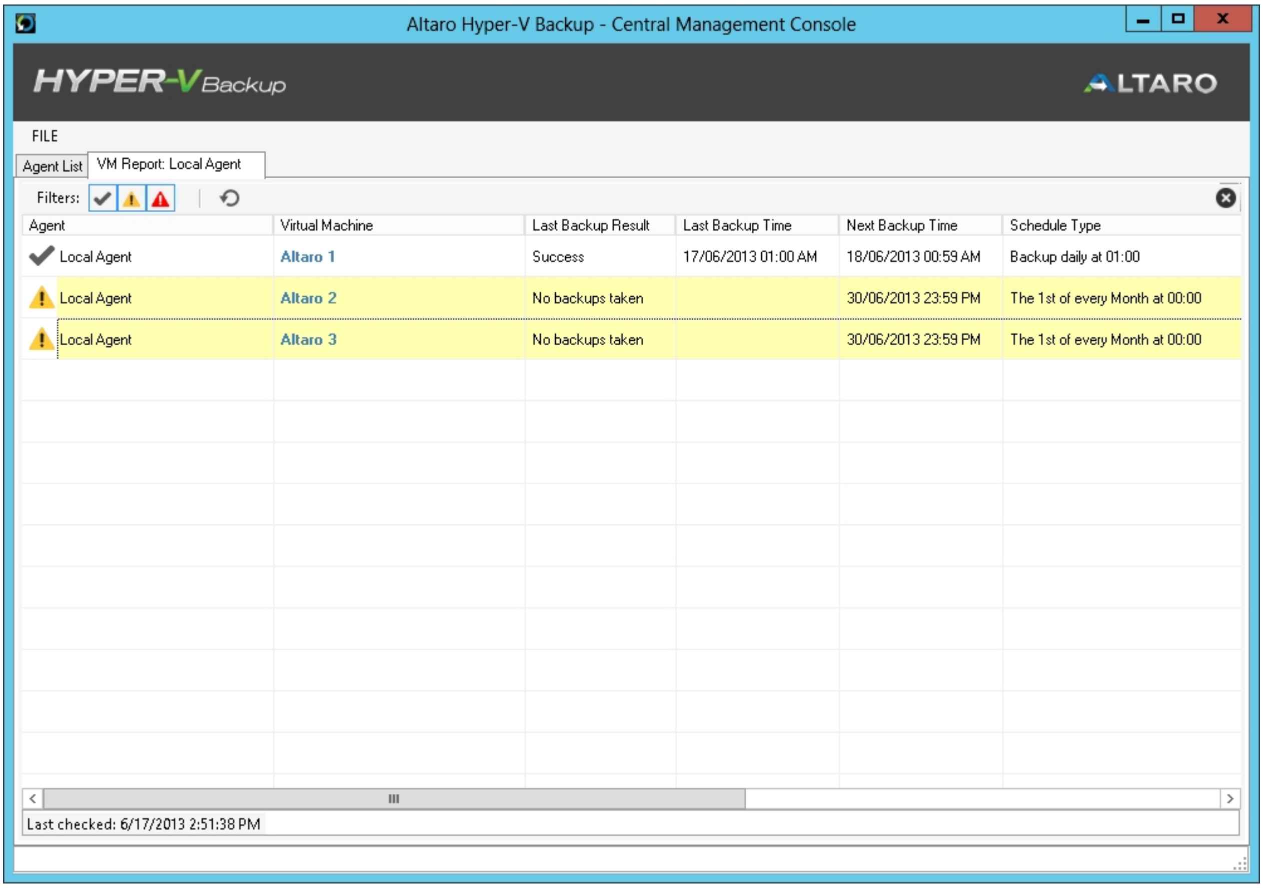


4. Right-clicking an Agent will bring up a menu for that particular agent as shown below:



Last Backup Today at 11:13, Next backup in 12 hrs 49 mins (updated: 12:10)

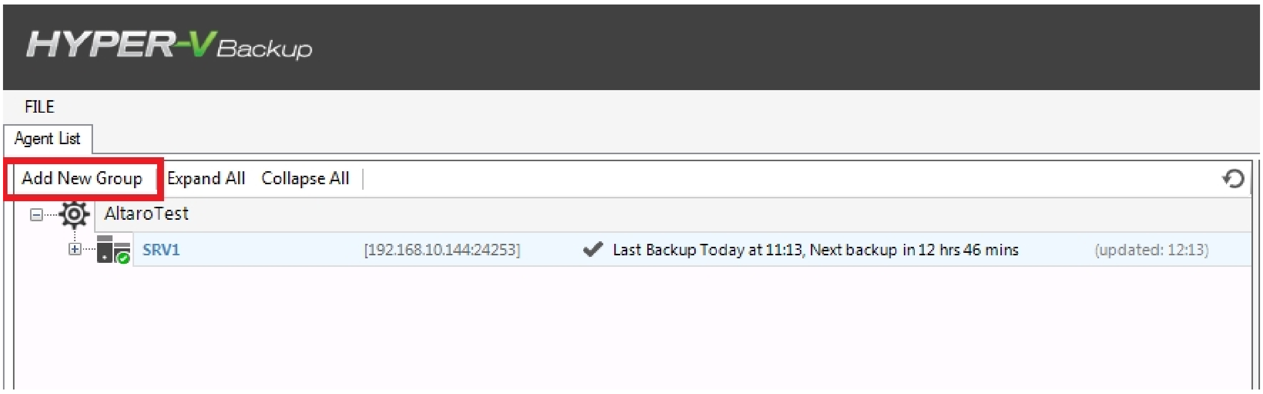
For each agent you have the following options:
- Connect to Agent and Manage - This will launch the full management console of the selected agent.
- View Guest VM Backup Report - This will bring up a report of the selected agent's backup status, results and sizes, similar to the one shown below.
- Edit Connection Details - This will allow you to change the Label, IP, Port and credentials of the connection to the selected agent.
- Remove Agent from list - This will delete the connection and remove the Agent from the Remote Management Console



Agent	Virtual Machine	Last Backup Result	Last Backup Time	Next Backup Time	Schedule Type
✓ Local Agent	Altaro 1	Success	17/06/2013 01:00 AM	18/06/2013 00:59 AM	Backup daily at 01:00
⚠ Local Agent	Altaro 2	No backups taken		30/06/2013 23:59 PM	The 1st of every Month at 00:00
⚠ Local Agent	Altaro 3	No backups taken		30/06/2013 23:59 PM	The 1st of every Month at 00:00

Last checked: 6/17/2013 2:51:38 PM

5. For better management and identification of your Agents, you can also create a new Agent groups from this screen using the "Add New Group" button on the top-left hand side of the console as below:



AltaroTest

SRV1 [192.168.10.144:24253] ✓ Last Backup Today at 11:13, Next backup in 12 hrs 46 mins (updated: 12:13)