Hewlett Packard
Enterprise

HPE VM Explorer

Software Version: 6.7

HPE VM Explorer User Guide

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Documentation updates

The title page of this document contains the following identifying information:
- Software Version number, which indicates the software version.
- Document Release Date, which changes each time the document is updated.
- Software Release Date, which indicates the release date of this version of the software.

To check for recent software updates, go to https://softwaresupport.softwaregrp.com/patches.

To verify that you are using the most recent edition of a document, go to https://softwaresupport.softwaregrp.com/manuals.

This site requires that you register for an HPE Passport and sign in. To register for an HPE Passport ID, go to https://hpp12.passport.hpe.com/hppcf/login.do.

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- Search for knowledge documents of interest
- Submit and track support cases and enhancement requests
- Download software patches
- Access product documentation
- Manage support contracts
- Look up HPE support contacts
- Review information about available services
- Enter into discussions with other software customers
- Research and register for software training

Most of the support areas require that you register as an HPE Passport user and sign in. Many also require a support contract.

To register for an HPE Passport ID, go to https://hpp12.passport.hpe.com/hppcf/login.do.

To find more information about access levels, go to https://softwaresupport.softwaregrp.com/access-levels.

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Get Started

HPE VM Explorer is a low-cost, easy-to-use and reliable backup solution for VMware vSphere and Microsoft Hyper-V environments. Within minutes you can start centrally managing your backups to disk, tape and cloud through an intuitive and easy-to-navigate web interface.

Advanced backup capabilities include incremental backups and replication, snapshot integration and native cloud support for leading Cloud platforms. With instant VM recovery, direct file level restore from the cloud, encryption, and verification, HPE VM Explorer delivers resiliency, efficiency and agility in your virtual environments.

The following documentation explains the main tasks required for configuration and daily use of HPE VM Explorer. All services hereinafter are brought to you by HPE.

For more information on which HPE VM Explorer version is best suited to your needs, consult our website: https://software.microfocus.com/en-us/products/vm-server-backup/overview.

Requirements

In order to install and operate HPE VM Explorer, you need to meet the system requirements on your computer. For more information, see the HPE VM Explorer Support Matrix.

Browser prerequisites

You need to have one of these browsers installed on your system to download and run HPE VM Explorer:

- Mozilla Firefox
- Google Chrome
- Microsoft Edge
- Opera
- Internet Explorer 11

Operating System and .NET version prerequisites

HPE VM Explorer has been designed to work with the following operating systems:

- Windows Server 2016
- Windows Server 2012 R2
- Windows Server 2012
- Windows Server 2008 R2

The required Microsoft .NET Framework version is 4.6.2.

Hardware prerequisites

In order to install and run HPE VM Explorer 6.7, your local computer needs to meet the following hardware requirements:

- CPU 2 GHz x64 or higher
- 8 GB RAM
- 1 GB free disk space for installation
- Broadband network connection (100 MB/s or higher)

Supported ESXi versions

HPE VM Explorer supports the following versions of ESXi:

- VMware ESXi 6.5
- VMware ESXi 6.0
- VMware ESXi 5.5

Supported Microsoft Hyper-V versions

HPE VM Explorer supports the following Microsoft Hyper-V versions:

- Hyper-V Server 2016
- Hyper-V Server 2012 R2
- Hyper-V Server 2012
- Hyper-V Server 2008 R2 (SP1)

> **NOTE:** .NET Framework 4.6.2 must also be installed on your Hyper-V host.

Supported tape libraries/autoloaders

HPE VM Explorer supports the following tape libraries/autoloaders:

- HPE StoreEver 1/8 G2 Tape Autoloader
- HPE StoreEver MSL2024
- HPE StoreEver MSL4048
- HPE StoreEver MSL6480
- HPE StoreEver MSL8096
- HPE StoreOnce VTL
- Dell PowerVault 124T

> **NOTE:** HPE VM Explorer requires barcodes on every tape (which means, no support for standalone tape drives, or libraries without labeled media). HPE VM Explorer does not currently work with mixed media partitions. HPE VM Explorer does not support WORM media. HPE VM Explorer does not currently support Cleaning tapes.

Supported storage systems

HPE VM Explorer supports the following virtual storage systems:

- HPE 3PAR StoreServ, OS Version 3.1.3
- EMC ScaleIO 1.32
- HPE StoreVirtual VSA 12.6
- HPE StoreOnce Catalyst 3.16

Supported Microsoft Exchange Server releases

HPE VM Explorer supports Microsoft Exchange Server versions 2013 and 2016 for the granular Exchange e-mail item recovery feature.

Installation and Configuration

After downloading HPE VM Explorer, we recommend that you go to your browser's download folder and transfer the HPE-VMExplorer-6.7.xxx.exe file to a folder of your convenience. Then:

1. Run *HPE-VMExplorer-6.7.xxx.exe*. **Step Result**: The **HPE VM Explorer Setup** wizard screen is displayed.

2. In the **Welcome to the HPE VM Explorer Setup** wizard screen, click **Next**.

3. In the **End User License Agreement** wizard screen, read the terms and conditions, select the **I accept the terms in the License Agreement** checkbox and click **Next**.

4. In the **Destination Folder** wizard screen, click **Change** if you want to select a different destination folder than the default one, or click **Next**.

5. Click **Install**.

6. In the **Completed the HPE VM Explorer Setup Wizard** screen, the **Launch HPE VM Explorer now** checkbox is selected by default, but you can clear it if you want to run HPE VM Explorer at a later date. Click **Finish** to exit the installation wizard and start HPE VM Explorer.

Important! You need to have SSL 3.0 or earlier deactivated on the computer on which you are installing HPE VM Explorer. See the Microsoft Knowledge Base Article dedicated to restricting the use of certain cryptographic algorithms and protocols in this respect, available here.

Starting HPE VM Explorer

If the **Launch HPE VM Explorer now** checkbox is selected by default in the **Completed the HPE VM Explorer Setup Wizard** screen at the end of your installation process, HPE VM Explorer will start as soon as the installation is complete.

To start HPE VM Explorer independently from the installation process, go to *Start > All Programs > HP Enterprise > HPE VM Explorer* or double-click the HPE VM Explorer icon on your desktop.

- If this is your first time using HPE VM Explorer, the **HPE VM Explorer - WebServer Settings** window is displayed, where you can configure the web settings for the application. For more information, see Configuring HPE VM Explorer, on the next page.

- If this is not your first HPE VM Explorer installation and you want to preserve your previous settings (and your previous installation directory is intact), click the green Earth icon in the HPW HPE VM Explorer® - Starter screen. To modify your previously saved configurations, click Web Settings. For more information, see Configuring HPE VM Explorer, on the next page.

HPE VM Explorer Starter screen

Next, you need to log on to the application. For more information, see Running the HPE VM Explorer web interface, on page 18.

Configuring HPE VM Explorer

If you have not configured the HPE VM Explorer web server or if the HPE VM Explorer web server is not running, once you run HPE VM Explorer for the first time, you need to configure the web server settings. To do so, click **WebServer Settings** in the **HPE VM Explorer® – Starter** screen.

1. In the **HPE VM Explorer – Web Server** settings window, configure the boxes, as follows:

    In the Web Interface Address section:

    Hostname or IP

    Change your local computer hostname or IP, if different from the default one.

    Listening Port

    Change the listening port, if different from the default one.

    Enable HTTPS

    Select this checkbox to make the web interface accessible using the HTTPS protocol. This causes the web address to change accordingly. Not enabling HTTPS will require you to change the listening port from the default 443. Also, depending on your selection, the UI options available to you at this stage may vary.

    Certificate

    Displays the HTTPS certificate. A self-signed HTTPS certificate for HPE VM Explorer is automatically installed on your local computer, in the Personal store. To find out more information about your certificate, click the hyperlink and then read the **Certificate** dialog box.

    Important! When using your personal certificate, make sure it is valid (not expired), that it has a private key and that the Enhanced Key Usage has already been set. The Enhanced Key Usage is an option you need to add in your Personal Certificate to make it valid for HPE VM Explorer.
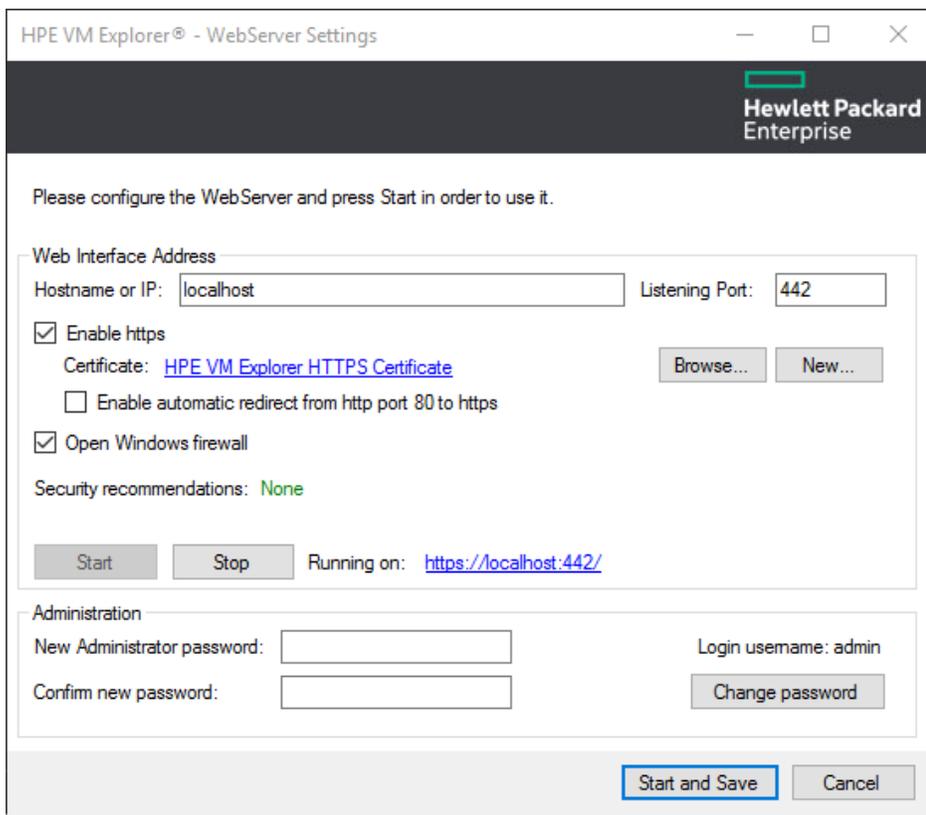
WebServer Settings

The **Friendly Name** (or the **Issuer By** name, if the first is not available) of the current HTTPS certificate is displayed in the **Details** tab, otherwise HPE VM Explorer will display *Certificate not found*.

> **NOTE:** You can use only certificates already installed in the following folders of your local computer:
> - Personal
>
> - Trusted Root Certification Authorities
>
> - Intermediate Certification Authorities
>
> - Trusted Publishers
>
> - Untrusted Certificates
>
> - Third-Party Root Certification Authorities
>
> - Trusted People
>
> - Other People

When finished, click **OK** to return to the **HPE VM Explorer- WebServer Settings** window.

Browse…

Click this button to add a new certificate. If you already have one available on your computer, select the desired certificate in the **Windows Security** dialog box and then click **OK**.

New

Click this button to generate and install a new HPE VM Explorer HTTPS certificate after clicking **OK** in the **Create new https certificate** confirmation dialog box.

Enable automatic redirect from http port 80 to https

Select this checkbox to enable automatic redirection from the default HTTP port 80.

Open Windows firewall

Select this checkbox to enable Windows Firewall to allow access for HPE VM Explorer.

SSL protocols status: Disabled/Enabled

HPE VM Explorer needs all SSL protocols (3.0, 2.0) to be disabled to function properly. For more information, see Microsoft KB Article 187498.

Start

Click to start the web server, if not started already.

Stop

Click to stop the web server, if needed.

Running on:

Displays the localhost. Note that, depending on the settings, your browser could display a warning message when opening HTTPS links, as the HTTPS certificate is self-signed and not issued by a trusted certificate authority. To select a user trusted certificate, click **Browse…** See earlier in this publication for the options available to you at this stage.

In the Administration section:

New Administrator password

Type your administrator password before entering the web interface for the first time. The default login user name is *admin*. Your password must comply with the HPE VM Explorer security policy and must observe the following requirements whenever you create or modify a user:

- A minimum of 10 and a maximum of 20 characters

- At least one lower case letter [a-z]

- At least one upper case letter [A-Z]

- 2 digits (0-9)

- At least 1 special character (such as: % & ? ; : ! - . _ * @ # + $ =)

To recover a lost password, see Recovering your password, on page 126.

Confirm new password

Confirm your administrator password.

Change password

Click if you need to change your existing password.

2. When finished, click **Start and Save**. **Step Result**: If you have correctly configured all settings, HPE VM Explorer opens in your default browser. For the list of supported browsers, see Browser prerequisites, on page 10.

Disabling SSL protocols

For security purposes, we recommend that you disable SSL protocols versions 2.0 and 3.0 to force the use of Transport Layer Security (TLS) when using HPE VM Explorer.

To disable SSL protocol 2.0:

1. Go to *Start > regedit.exe*, right-click it and point to **Run as administrator** on the shortcut menu.

2. In the **Registry Editor** window, expand the tree to *HKEY_LOCAL_ MACHINE\SYSTEM\CurrentControlSet\Control\SecurityProviders\Schannel\Protocols\SSL 2.0*.

3. If, under **Protocols**, the keys from the subpaths **SSL 2.0/Server/Enabled** and **SSL 2.0/Client/DisabledByDefault** do not exist, create them, as follows:

   a. Right-click **Protocols** and, in the shortcut menu, click *New > Key* and name the key **SSL 2.0**.

   b. Right-click the **SSL 2.0** key, point to *New > Key* and then name the key **Client**.

   c. Under **SSL 2.0**, right-click **Client**, point to *New > DWORD (32-bit) Value* and name the value **DisabledByDefault**.

   d. Right-click the **SSL 2.0** key, point to *New > Key* and name the key **Server**.

4. Under **SSL 2.0**, right-click **Server**, point to *New > DWORD (32-bit) Value* and name the value **Enabled**.

5. Under **SSL 2.0**, select **Client** and then, in the right pane, double-click the **DisabledByDefault REG_DWORD** value.

6. In the **Edit DWORD (32-bit) Value** dialog box, in the **Value Data** box, change the value to **1** and click **OK**.

7. Under **SSL 2.0**, select **Server** and then, in the right pane, double-click the **Enabled REG_ DWORD** value.

8. In the **Edit DWORD (32-bit) Value** dialog box, in the **Value Data** box, leave the value at **0** and then click **OK**.

9. Restart your Windows server.

To disable SSL protocol 3.0:

1. Go to *Start > regedit.exe*, right-click it and point to **Run as administrator** on the shortcut menu.

2. In the **Registry Editor** window, expand the tree to **HKEY_LOCAL_ MACHINE\SYSTEM\CurrentControlSet\Control\SecurityProviders\Schannel\Protocols\SSL 3.0**.

3. If, under **Protocols**, the keys from the subpath **SSL 3.0/Server/Enabled** do not exist, create them, as follows:

   a. Right-click **Protocols** and, on the shortcut menu, point to *New > Key* and name the key **SSL 3.0**.

   b. Right-click the **SSL 3.0** key, point to *New > Key* and name the key **Server**.

    c. Under **SSL 3.0**, right-click **Server**, point to ***New > DWORD (32-bit) Value*** and name the value **Enabled**.

4. Under **SSL 3.0**, select **Server** and then, in the right pane, double-click the **Enabled DWORD** value.

5. In the **Edit DWORD (32-bit) Value** dialog box, in the **Value Data** box, leave the value at **0** and then click **OK**.

6. Restart your Windows server.

For more information, visit the Microsoft support page: https://support.microsoft.com/en-us/kb/245030.

Disabling 3DSCipher

To avoid a security issue, you must also disable 3DSCipher on the system where you have installed HPE VM Explorer. To do so:

1. Open your Group Policy Editor. To do so, go to ***Start > Run***, type *gpedit.msc* and press **Enter**.

2. In the **Local Group Policy Editor** screen, expand ***Administrative Templates>Network*** and click **SSL Configuration Settings**.

3. Under **Setting**, open **SSL Cipher Suite Order** and then, in the **SSL Cipher Suite** dialog box, click **Enabled**. The SSL Cipher suites are displayed below **Options**, delimited by "," (comma).

4. Copy and paste the SSL Cipher suites in a text editor, then search and remove ciphers containing the *3DES* occurrence. Then, replace the SSL Cipher suites in the **SSL Cipher Suite** dialog box with the edited string and click **Apply**.

5. When finished, restart your computer to apply the new settings with the disabled 3DSCipher.

Configuring TCP ports

HPE VM Explorer uses different TCP ports to communicate with hosts or enable communication between hosts:

Server	Required Port Number	Observations
ESXi Servers	443 (HTTPS)	Enabling **Use HPE VM Explorer Agent** on ESXi requires ports 22 (SSH), 443 (HTTPS) and 62000-65000. Using VDDK requires port 902.
vCenter	443 (HTTPS)	-
Hyper-V Servers	9000, 9001, 62000-65000	-
Linux and FreeBSD	22 (SSH), 2500-3000 and 62000-65000	-

Running the HPE VM Explorer web interface

After configuring HPE VM Explorer, you need to log on using the credentials you selected during the configuration stage. For more information, see Configuring HPE VM Explorer, on page 13.

To run HPE VM Explorer, go to **Start > RUN > HPE VM Explorer** and, in the **HPE VM Explorer® - Starter** window, click the green Earth icon and type your login credentials.

The administrator login name is **admin** and the password has to be previously configured in the web interface settings. If your credentials are correct, you can access the HPE VM Explorer interface.
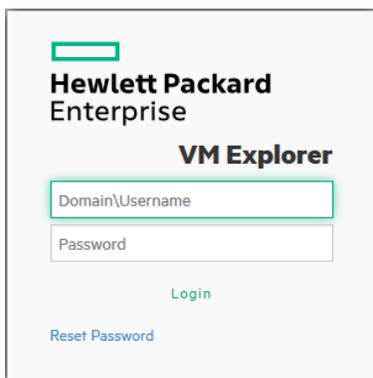
Web logon

If you have not selected your language of choice yet, you can choose which localization to use in the **HPE VM Explorer language selection** screen.
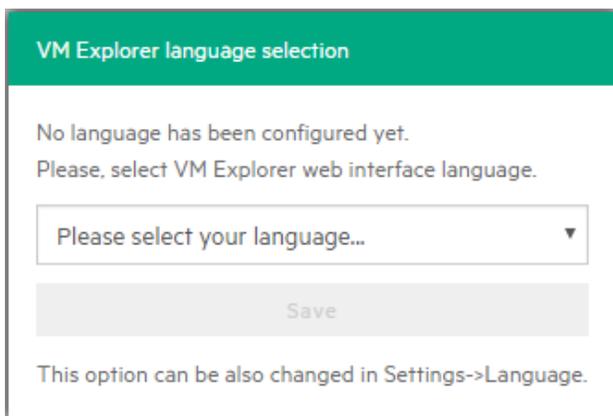
Language selection (first time access)

The languages currently available to you are:

- English
- French
- German
- Italian
- Spanish
- Japanese

- Russian
- Chinese—simplified
- Portuguese—Brazilian
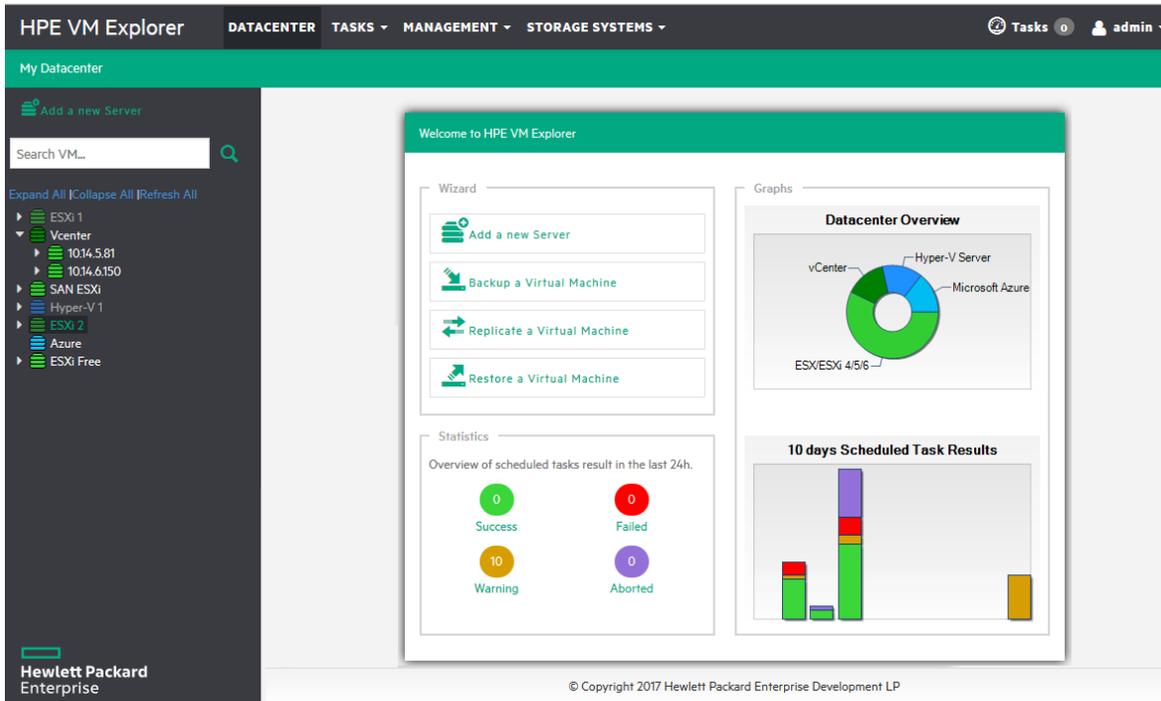
HPE VM Explorer Datacenter view

HPE VM Explorer license

HPE VM Explorer 6.7 features two types of licenses which function concurrently: the legacy license and the HPE AutoPass license.

> **NOTE:** When opening HPE VM Explorer for the first time, you are granted a 15 days evaluation version of the Enterprise Edition by default. You will then need to manually add your license key following the procedure described later in this document. When the free trial period expires, HPE VM Explorer's features will be reduced to the Free edition capabilities until a new license is installed. To purchase an HPE VM Explorer license, visit
> https://software.microfocus.com/buy/vm-server-backup.

To activate your HPE VM Explorer license:

1. In the **Settings** view, click **License Manager** and then click **Activate New License**.
2. In the **License Manager** wizard, select which type of license you want to activate: **HPE AutoPass** or **Legacy** (Trilead). The next screen varies depending on your selection at this stage.

   > **NOTE:** If you have an existing license with HPE VM Explorer, there is no need for you to

change your license at this time. To get an HPE AutoPass License, log on to the HPE Entitlement site, at http://www.hpe.com/software/entitlements.
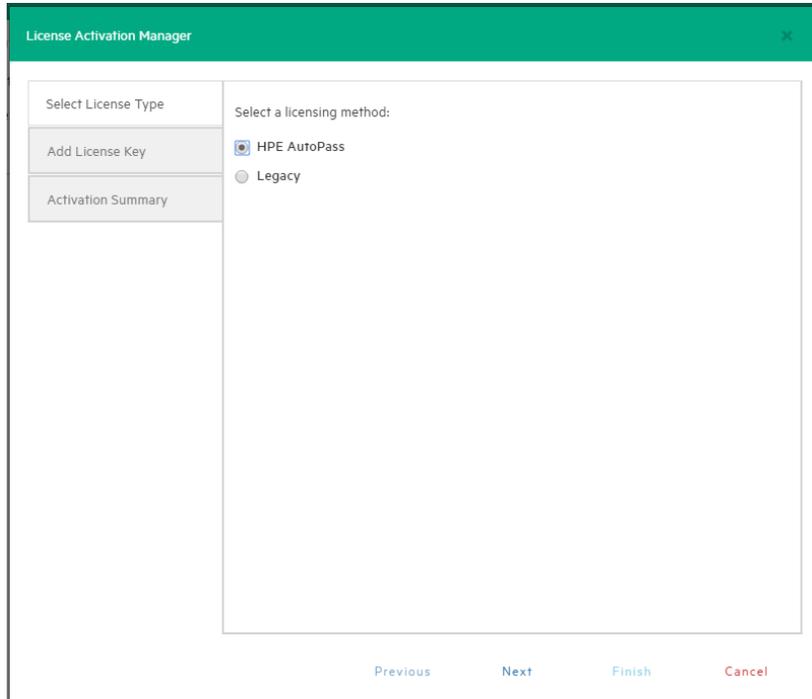
License Activation Manager wizard - Select License Type screen

3. In the **Add License Key** wizard screen:

    - For **HPE AutoPass**—Click **Browse** to upload a valid license or you can paste the activation code in the **License Key** section. When finished, click **Activate**.
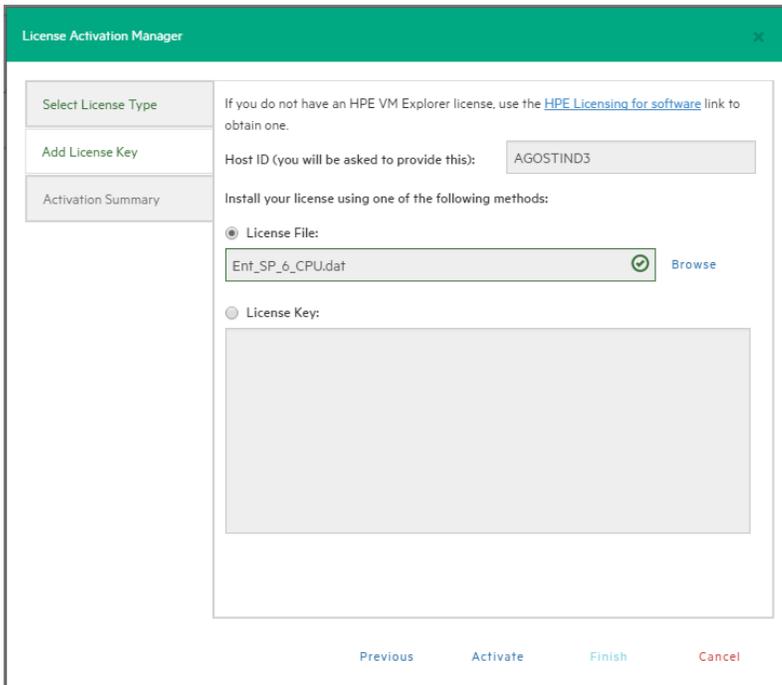
License Activation Manager wizard - Add License Type for HPE AutoPass screen

- For **Legacy**—Paste the license key you have received from your vendor and then click **Activate**.
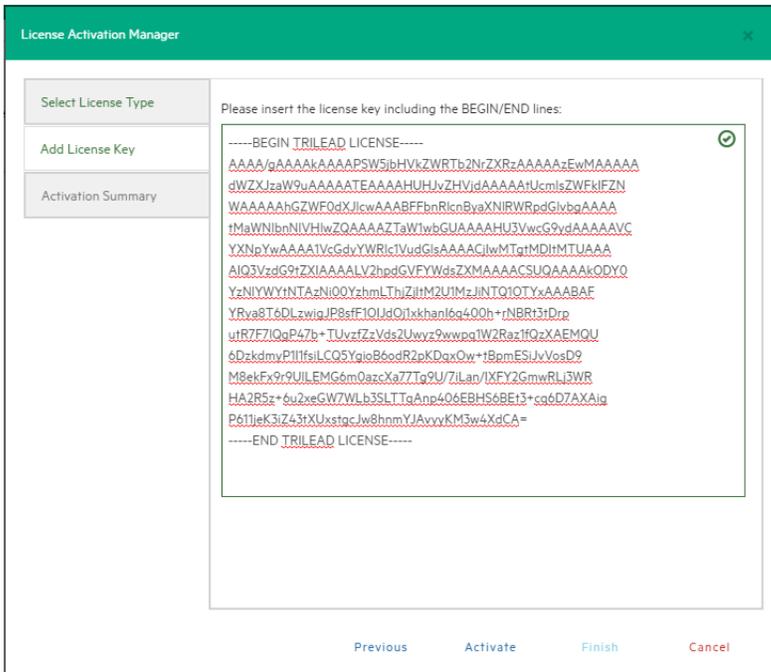
License Activation Manager wizard - Add License Type for Legacy screen

4. In the **Activation Summary** screen, you can see the status of your License Key. Click **Close** to return to the **License Manager** section.
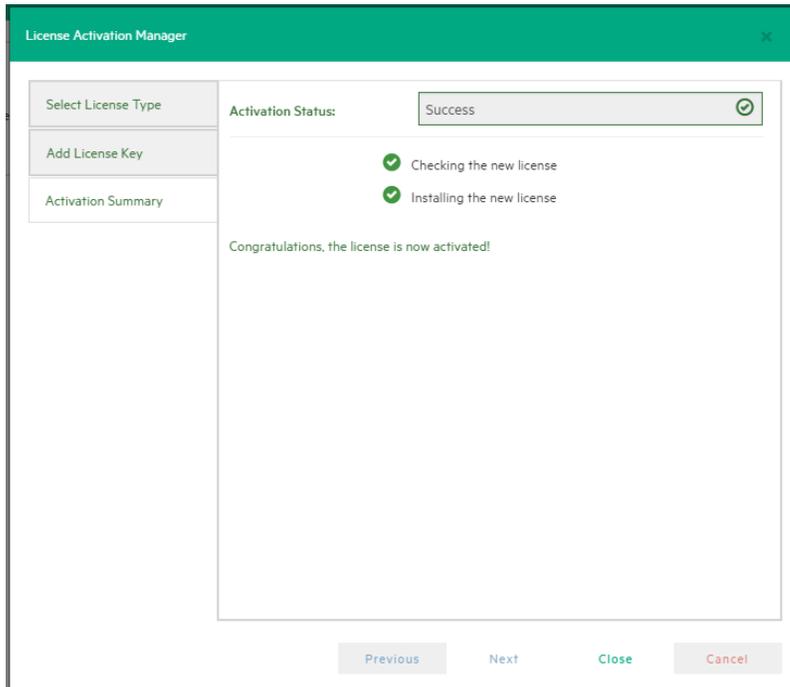
License Activation Manager wizard - Activation Summary screen

5. In the **License Manager** section you can see the number of sockets purchased. The following license options are available to you:

- HPE VM Explorer Professional Starter Pack license provides 4 sockets by default.

- HPE VM Explorer Additional Socket Pro Edition license provides a custom number of sockets.

- HPE VM Explorer Enterprise Starter Pack license provides 6 sockets by default.

- HPE VM Explorer Additional Socket Enterprise Edition license provides a custom number of sockets.

> **NOTE:** Contact your vendor if you need additional socket licenses for your environment.

Setting Up Your Storage Environment in HPE VM Explorer

You can set up a variety of storage targets in HPE VM Explorer. For more information, see:

Working with Servers in HPE VM Explorer

You can add a large variety of servers to the HPE VM Explorer Datacenter, from hypervisors to public/private clouds, which you can later modify or delete.

Visual representations of the supported servers and VM status

To make navigation easier for you, every supported server is represented by a dedicated icon in the datacenter, as follows:

Folder

ESX/ESXi host

vCenter

Hyper-V

Hyper-V Cluster

Linux host

FreeBSD host

Amazon S3

OpenStack

Rackspace Cloud

Azure Compatible

S3 Compatible

In addition, various icons enable you to recognize the state of the Virtual Machine deployed in the hypervisor:

VM powered on

VM powered off

VM paused

VM in safe state (Hyper-V only)

Invalid VM

Unrecognized VM

Adding hypervisor servers

Before you can start using HPE VM Explorer, you need to add your hypervisor hosts.

There are two ways to add a hypervisor server.

1. Click the **Add a New Server** link on the intro page of HPE VM Explorer.
2. Click **Add Server**.

OR

1. Right-click **My DataCenter**.
2. Click **Add Server**.

   Both methods start the **Add Server Wizard**.

3. In the **Add Server** wizard screen, select the type of server you want to add.
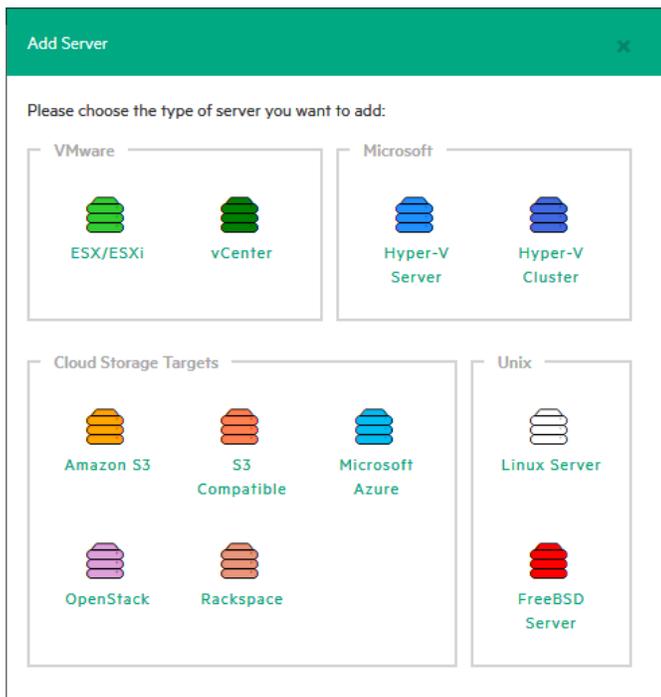
Add Server screen

4. Configure the **Add Server <Server Name>** wizard screen, as required. During the configuration process, you can navigate through the previously completed wizard screens at any time. Depending on your server selection at this stage, the procedures available to you may vary. Read later in this publication for more information.

> **NOTE:** Before adding servers to HPE VM Explorer, we recommend that you integrate your host (s) into a folder structure to increase your efficiency. To do so, right-click a host on the **My Datacenter** view, point to **Add Folder** and then type a meaningful name for your folder. Note that you can only add one child level folder to the root.

Initializing Virtual Disk Service (VD Service)

When enabled, the Virtual Disk service uses the VMware VDDK (Virtual Disk Development Kit) to perform backups. This will leverage VMware's VADP (vStorage API's for Data Protection) enabling enhanced features, including Change Block Tracking, which results in more efficient backups. This is only available for paid editions of VMware ESXi, it is not supported in ESXi Free.

To enable the Virtual Disk Service in HPE VM Explorer

1. Go to **<User Name> Manuals > Enabling Virtual Disk Service (VD Service).**
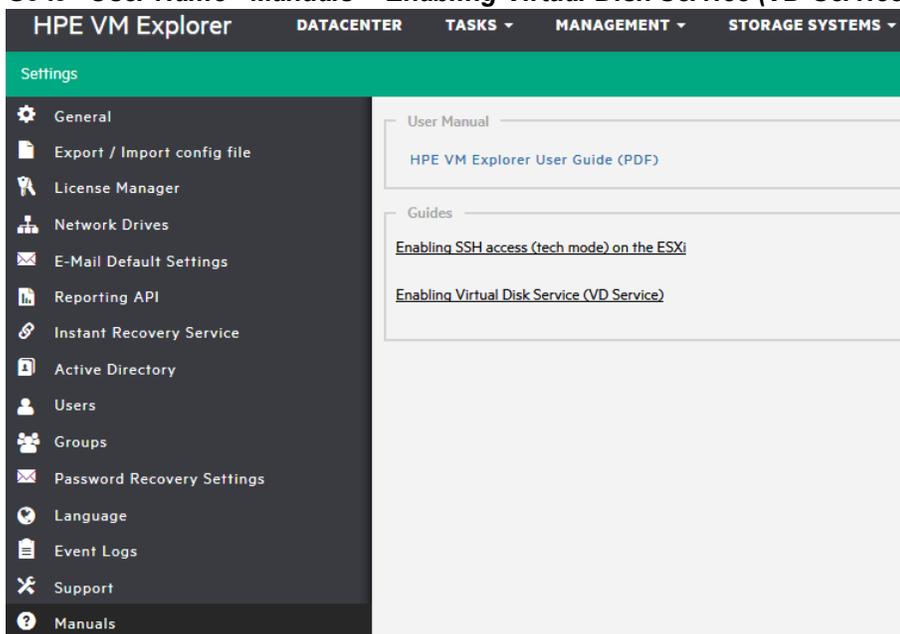
Settings - Manuals

2. In the **How to Enable Virtual Disk Service (VD Service)** screen, install the VDDK package on the computer where HPE VM Explorer is running from the manufacturer's website http://www.vmware.com/download/download.do?downloadGroup=VDDK65.
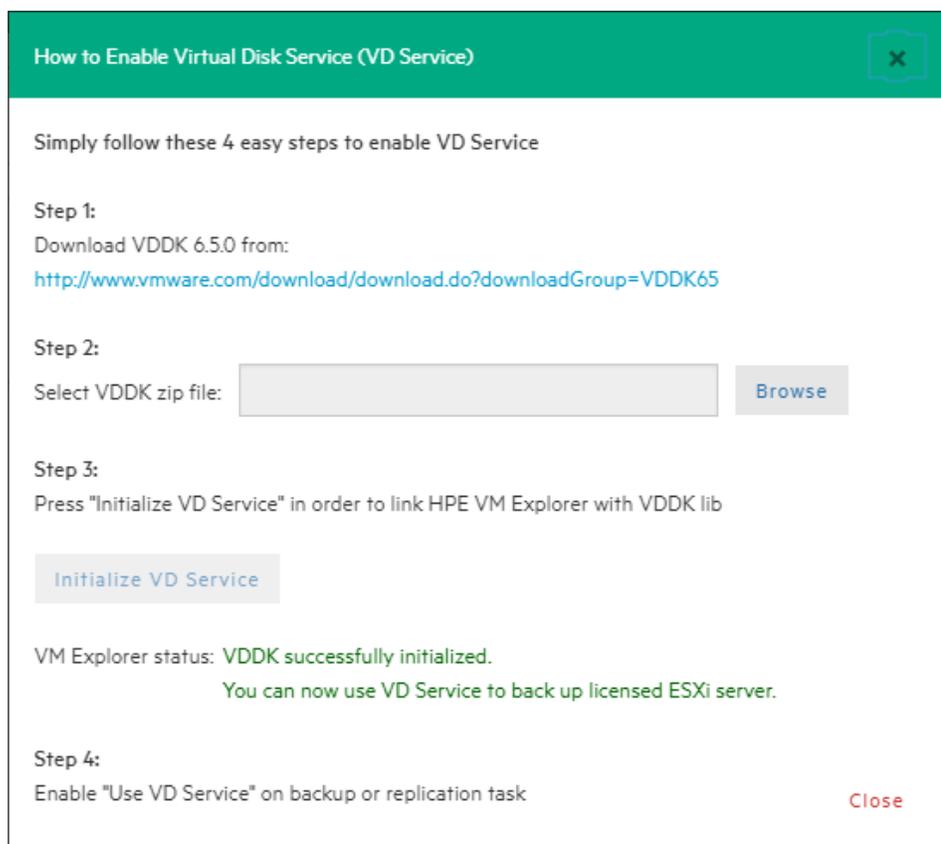
How to enable Virtual Disk Service (VD Service)

3. After installing the VDDK package, click **Initialize VD Service** in HPE VM Explorer.

Adding an ESXi server

You can add an ESXi server to HPE VM Explorer in the **Add Server (ESXi)** screen, which you can complete by clicking **Next** after filling in the required information. Note that, unless otherwise stated, these procedures are shared across the application when adding various servers and storage environments.

1. In the **Add Server** wizard, click **ESXi** and then, in the **Add Server (ESXi)** screen, select a display name for your server and browse to the desired location to store the server in the HPE VM Explorer Datacenter.

   NOTE: This action only organizes the server in different folders in the HPE VM Explorer Datacenter and will not influence backups or replication in any way.
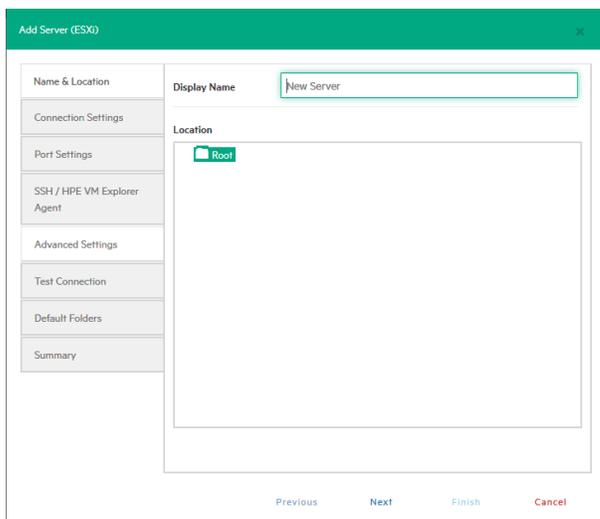
Add Server - Name & Location

2. In the **Connection Settings** screen, type the hostname (or IP), the username and the password, and the root password if you choose to connect to the host using a different user than the root.

> **NOTE:** If you connect to the host using a different user than "root", type the root password in the **Root Password** box.
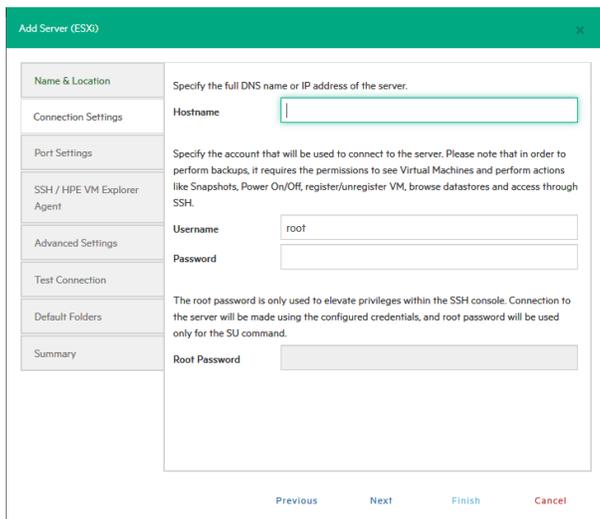
Add Server - Connection Settings

3. In the **Port Settings** screen, configure a port for SSH (if different from the default 22) and an HTTPS port for the ESXi Management Console (if different from the default 443).

> **NOTE:** : This procedure only applies to the ESXi host.
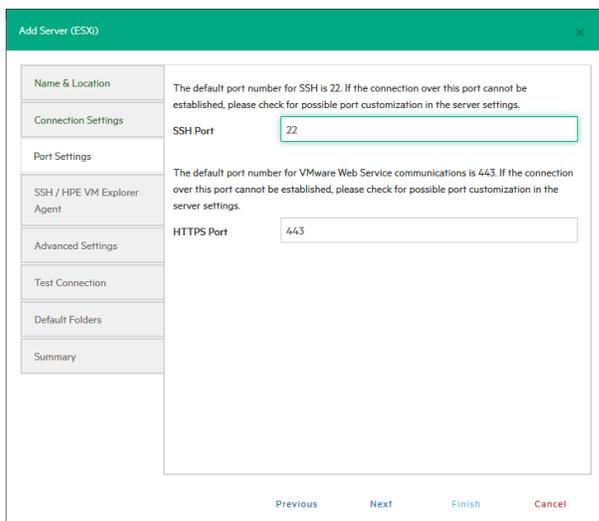
Add Server - Port Settings

4. In the **SSH / HPE VM Explorer Agent** wizard screen, select one of the following checkboxes.

> **NOTE:** This procedure only applies to the ESXi host. The HPE VM Explorer Agent is an automatically deployed wrapper over the Hypervisor API and it is used for performing various operations, such as creating, replicating, restoring backups and so on.)

a. **Enable SSH and use HPE VM Explorer agent automatically**. For ESXi 5.5 (or later), you can enable SSH and use the HPE VM Explorer agent automatically.

b. **Use SSH (SCP) to transfer files**. You can enable SSH to transfer files from your ESXi hosts. Click the link in the wizard screen to see how you can change your ESXi server into tech mode to enable SSH.

> **NOTE:** SSH is not faster than the normal ESXi API, but it is more stable for uploading files to your ESXi server.

c. **Try to use the HPE VM Explorer agent on ESXi**. HPE VM Explorer usually deploys an agent to the server so that backups are faster and more stable. ESXi does not support SSH by default, so no agent will be deployed. By selecting this option, HPE VM Explorer will deploy an agent to your ESXi server. We recommend that you activate this feature, as the performance will be much better than when using the official API.

> **NOTE:** Activating this feature is recommended, as the performance will be much better than when using the official API. Make sure the TCP ports 62000-65000 are available.
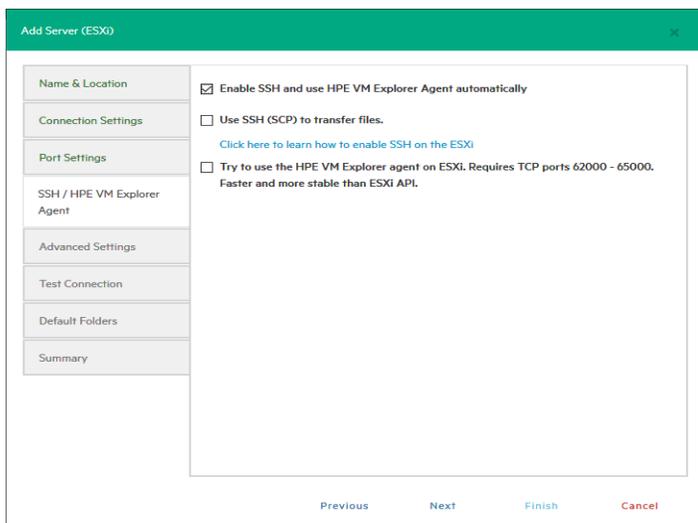
Add Server - SSH / HPE VM Explorer Agent

5. On the **Advanced Settings** tab, configure the following settings:

   a. **When using the backup agent, do not dynamically open the firewall**.

   This option only refers to Linux or ESXi 5.5 (or later) servers. HPE VM Explorer will configure the firewall automatically for your Linux or ESXi 5.5 (or later) server. You can open the ports yourself (for more information, see the HPE VM Explorer Practitioner Forum) and disable this option. In this case, the HPE VM Explorer Agent will not make any changes to your Linux or ESX firewall.

   b. **Use `vmkfstools` to locally copy virtual disks**

   This option is enabled by default and allows HPE VM Explorer to use the `vmkfstools` to copy virtual disks when the target host is the same as the source host. The use of `vmkfstools` increases the local copy speed but sometimes uses more system resources.

   Disable this option if you notice performance problems during your backups or replication from an ESXi host to the same ESXi host.

   c. **Enable VD Service automatically**

   This feature is enabled by default if VD service is already installed. Follow the on-screen instructions in the **Click here to learn how to install and initialize VD Service** section and configure the VD Service in the **How to Enable Virtual Disk Service (VD Service)** screen. For more information, see Initializing Virtual Disk Service (VD Service), on page 25.

   d. **Use VD Service**. If you enable this feature, you will be able to create incremental backups.

   To use the VD Service interface, you need to make a one-time installation and initialization of the VD libraries. For more details, follow the **Click here to learn how to install and initialize VD Service** link.

   > **NOTE:** Licensed ESXi 5.5 / 6.0 / 6.5 is required. This feature does not work on the free editions of ESXi 5.5 / 6.0 / 6.5.
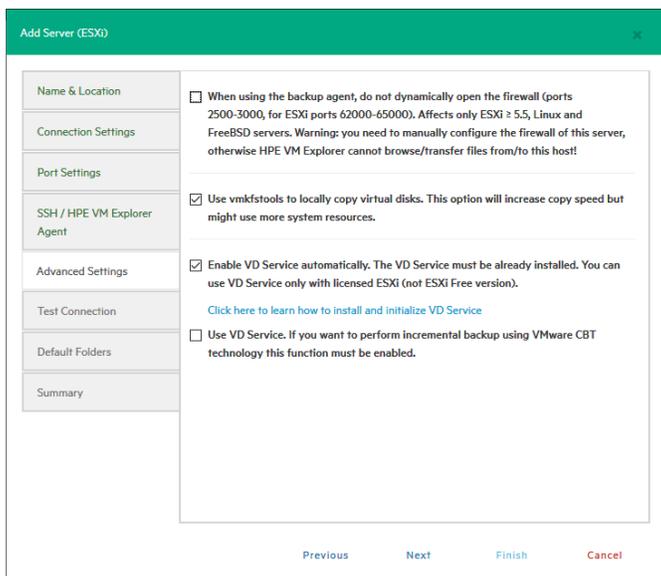
Add Server - Advanced Settings

6. In the **Test Connection** wizard screen, you can test your connectivity status. This is where you are notified of any errors.
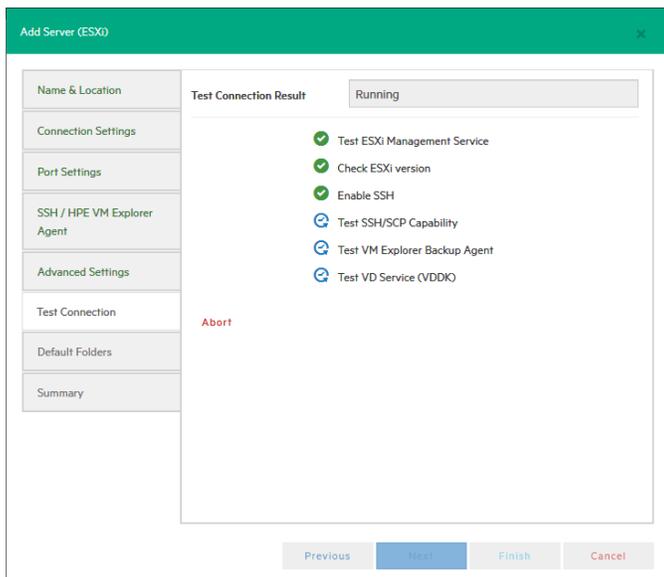
Add Server - Test Connection

7. In the **Default Folders** wizard screen, configure a default directory for backup/replication. This folder will be suggested to you in the setup dialog box when the current server is selected as a target server. You can also use the following placeholders:

   a. In the first box, configure a default directory which will appear on the backup/replication setup dialog when the current server is selected as a target server. You can use the {DATETIME}, {DATE} and {VM} placeholders in the path. Placeholders will be replaced with the following values:

   {DATETIME}: the current date/time, will write the date using the following format: YYYY-MM-DD-hhmmss

{DATE}: the current date, will write the date using the following format: YYYY-MM-DD

{VM}: the display name of the virtual machine.

b. In the second box, configure a default directory, which is used as the start directory when HPE VM Explorer File Explorer is selected. In File Explorer, when you start to navigate a specific server or when you click **Home**, you will be redirected to the configured directory.
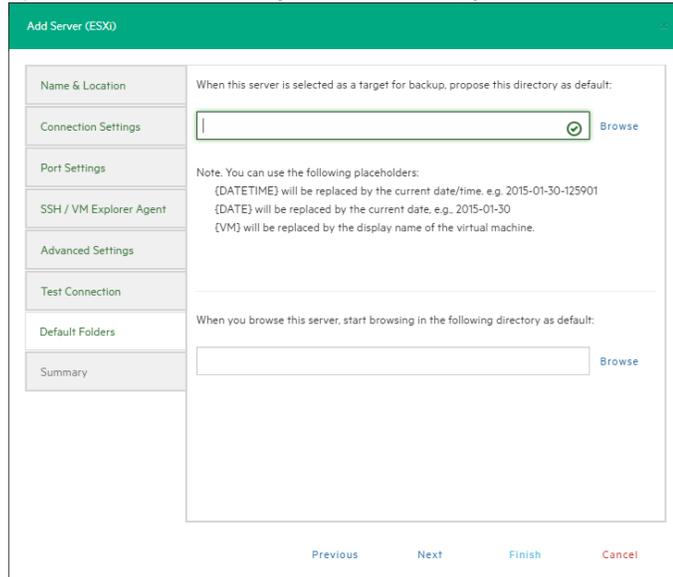
Add Server - Default Folders

8. The **Summary** tab displays the summary of your ESXi settings. Click **Save** to add your settings to your Datacenter.
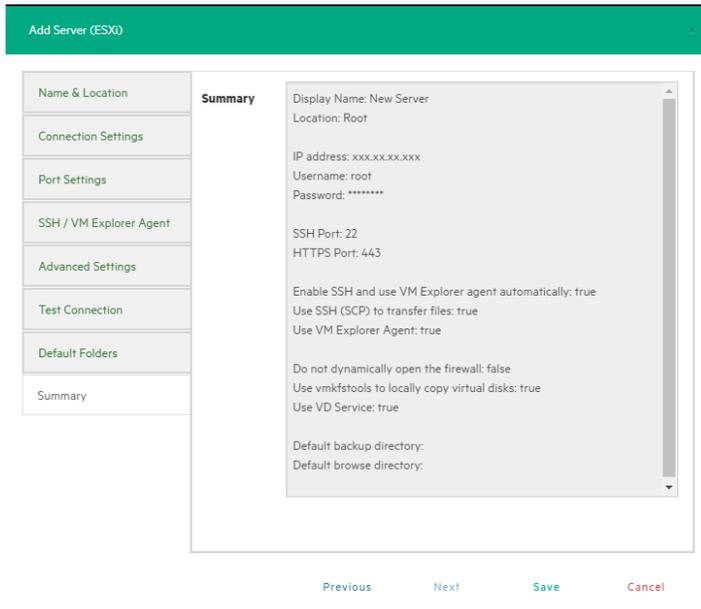
Add Server - Summary

Adding a Hyper-V server

This section covers the differences between adding an ESXi host and a Hyper-V host in the **Add Server** wizard of HPE VM Explorer. You can find information on the tabs not explained here earlier in this publication. For more information, see also Adding an ESXi server, on page 26.

To add a Hyper-V server

1. In the **Connection Settings (Hyper-V Server)** wizard screen, configure the credentials for connecting to the Hyper-V host. Make sure you have a valid account with the Hyper-V host. Select the **Start Hyper-V Agent using configured credentials** checkbox to start the Hyper-V Agent with these credentials, not as the local system's user, if such credentials exist. If not, the system will use the local system user's credentials as default.

Add server (Hyper-V) - Connection settings

2. In the **Advanced Settings (Hyper-V Server)** wizard screen, selecting the **Write data directly to the disk without being buffered** checkbox solves performance issues in applications and services when the system file cache consumes most of the physical RAM in certain services, as documented in the Microsoft KB Article 976618.

> **NOTE:** This option could slow down the backup process if target is set to **Local Computer**.
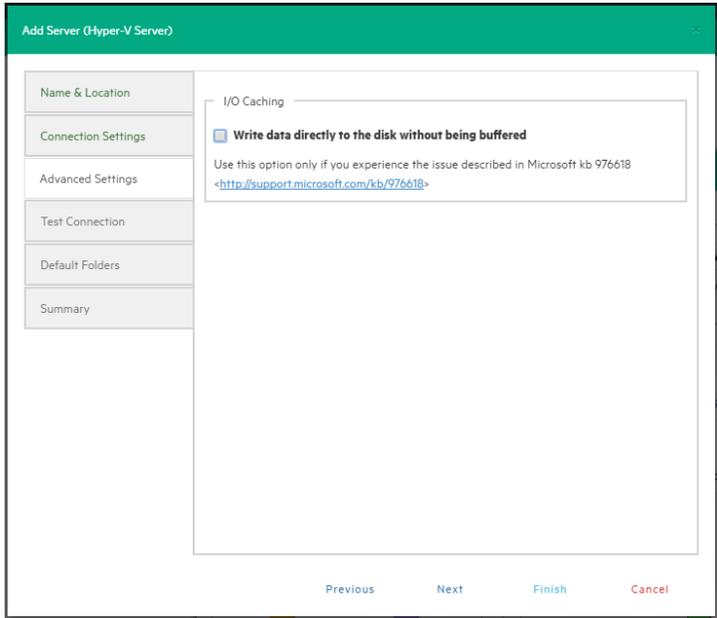
Add server (Hyper-V) - Advanced settings

3. In the **Test Connection (Hyper-V Server)** wizard screen, you can deploy the HPE VM Explorer Agent Manager Service to your server. In case of errors, the Agent Manager button is displayed; clicking it opens the Hyper-V Agent Manager window where you can manually deploy it. You can also choose to remove the HPE VM Explorer Agent Manager from the server. The HPE VM Explorer Agent Manager verifies if your HPE VM Explorer Agent is up-to-date and will install the latest version on your Hypervisor, if needed.
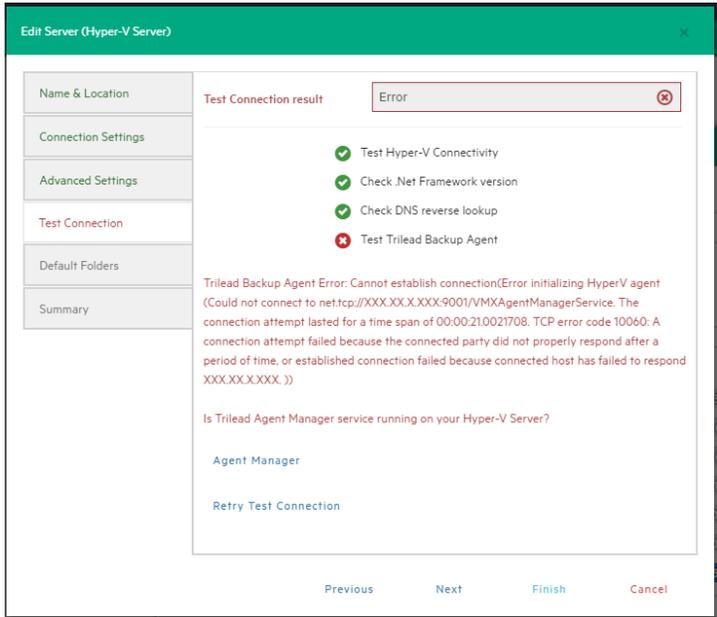
Add server (Hyper-V) - Test connection

You can also access this screen when selecting the server in the HPE VM Explorer Datacenter.
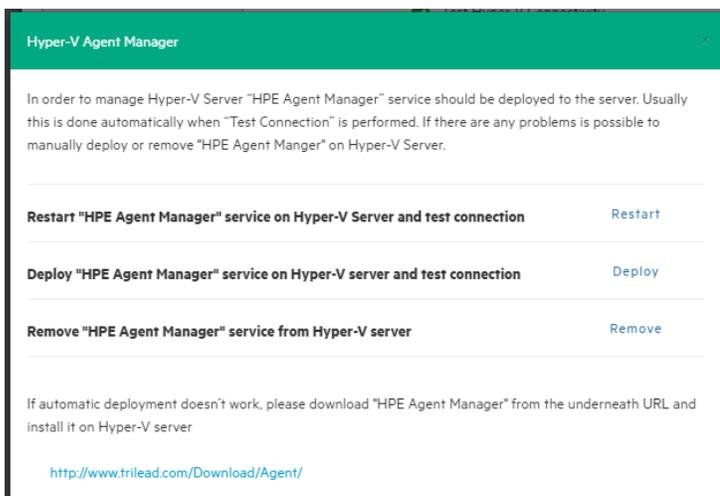
Add Server (Hyper-V) - Hyper-V Agent Manager

Adding a vCenter server

This section covers the differences between adding an ESXi host and a vCenter host in the Add Server wizard. You can find information on the wizard screens not explained here earlier in this publication. For more information, see also Adding an ESXi server, on page 26.

To add a vCenter

1. In the **Connection Settings (vCenter):** wizard screen, type the hostname (or IP), the username and the password for the vCenter server.
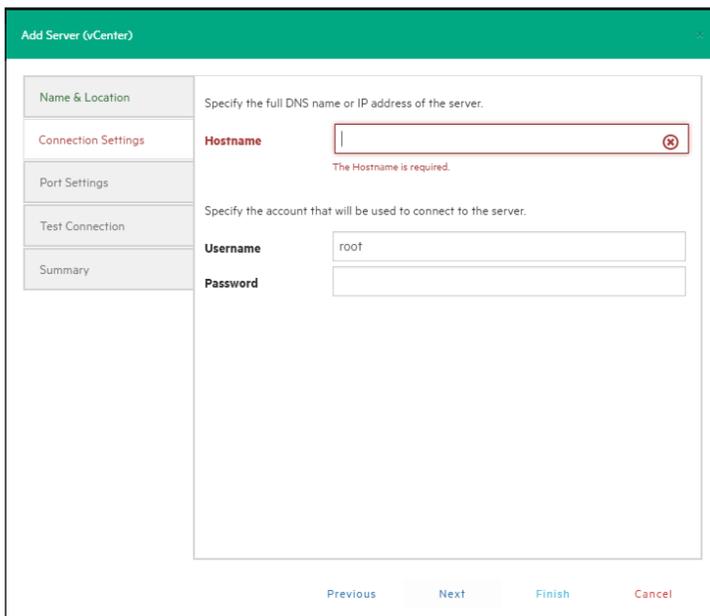
Add server (vCenter) - Connection settings

2. In the **Port Settings (vCenter)** wizard screen, configure an HTTPS port for the ESX Management Console (if different from the default 443).
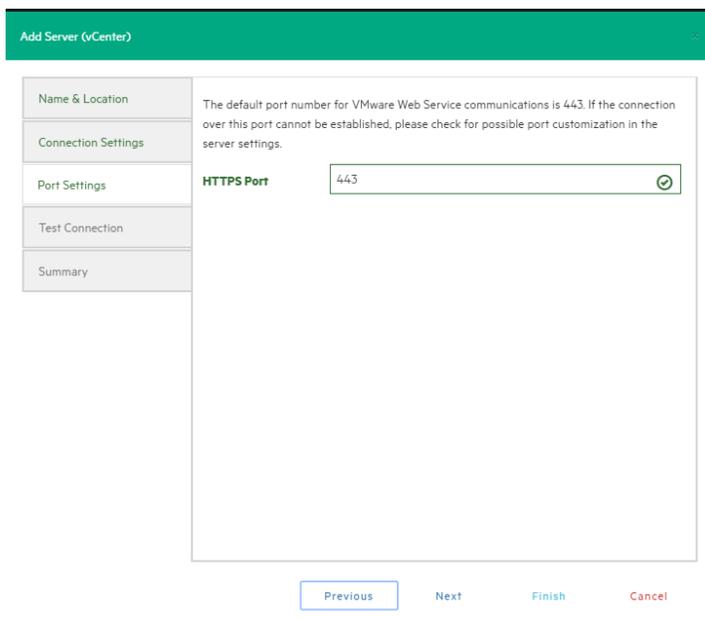
Add server (vCenter) - Port settings

After you have added the server, HPE VM Explorer displays all the hosts belonging to your vCenter.

To use the hosts, you must configure every host by right-clicking and selecting **Edit Server**. For configuration details, see Add an ESX/ESXi Server.

> **NOTE:** You cannot set ESXi servers to Lockdown mode because of permission issues. If ESXi servers are already in Lockdown mode, you must remove Lockdown. To do so, open the Direct Console User Interface (DCIU) on the host, press F2 for Initial Setup, and then select **Configure Lockdown Mode** and disable Lockdown mode.

To remove the lockdown mode

1. Open the Direct Console User Interface (DCIU) on the host.
2. Press **F2** for Initial Setup.
3. Select **Configure Lockdown Mode** and disable lockdown mode.

Adding storage target servers

In HPE VM Explorer, you can add the following storage targets: Amazon S3, OpenStack, Rackspace and Microsoft Azure cloud, as well as Linux and FreeBSD servers.

> **NOTE:** You cannot use any of the cloud storage or Unix servers as targets for VM replication.

Adding an Amazon S3 storage target

This section covers the differences between adding an ESXi host and adding an Amazon S3 Cloud host in the Add Server wizard. You can find information on the wizard screens not explained here earlier in this publication. For more information, see also Adding an ESXi server, on page 26.

To add an Amazon S3 storage target, in the **Connection Settings (Amazon S3 Cloud)** wizard screen, add your credentials to connect to the Amazon S3 Cloud as well as the region with which you want to work. Make sure you have access to an Amazon S3 server and to your cloud account's Access Key ID and Secret Access Key and type this information in the Connection Settings wizard screen. For more information, click here. You can select All Regions or just one of them from the list. If you select a specific region, the region-specific bucket will become visible.

> **TIP:** Choosing a specific region will reduce data latency.
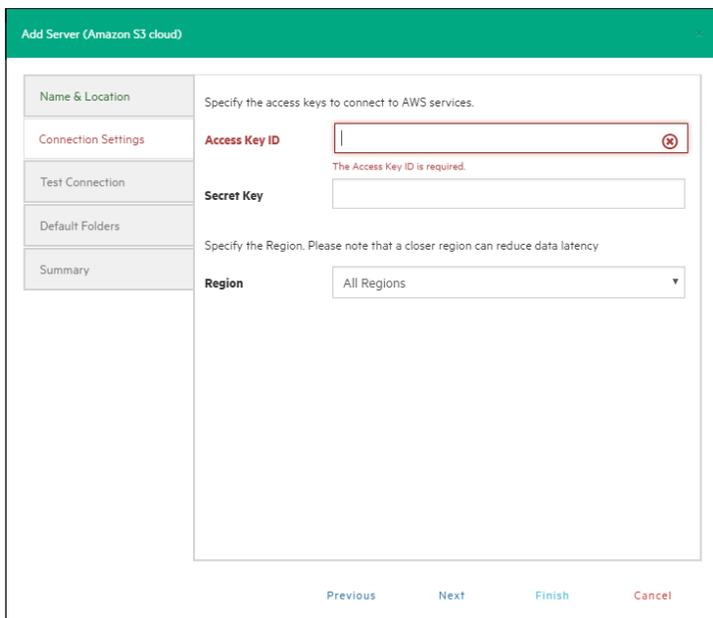
Add server (Amazon S3) - Connection settings

Once finished, you can schedule your backups to the Amazon S3 server. For more information, see .

Adding OpenStack, Rackspace, Microsoft Azure and Amazon S3 Compatible Cloud storage targets

This section covers the differences between adding a hypervisor host and adding an OpenStack, Rackspace, Microsoft Azure cloud or Amazon S3 Compatible storage target in the **Add Server** wizard. You can find information on the wizard screens not explained here earlier in this publication. For more information, see also .

You can choose between making backups directly to the cloud or to a local storage and then uploading the backup to the cloud.

> **NOTE:** You cannot use any of the cloud storage or Unix servers as targets for VM replication.

In the **Connection Settings** wizard screen, type the credentials you need to connect to the selected cloud. For OpenStack, HPE Helion and Rackspace, you can also select if you want to access to the **Tenant Name** or the **Tenant ID** and you can specify which one(s).

> **NOTE:** Earlier versions used the term *Project* instead of *Tenant*.
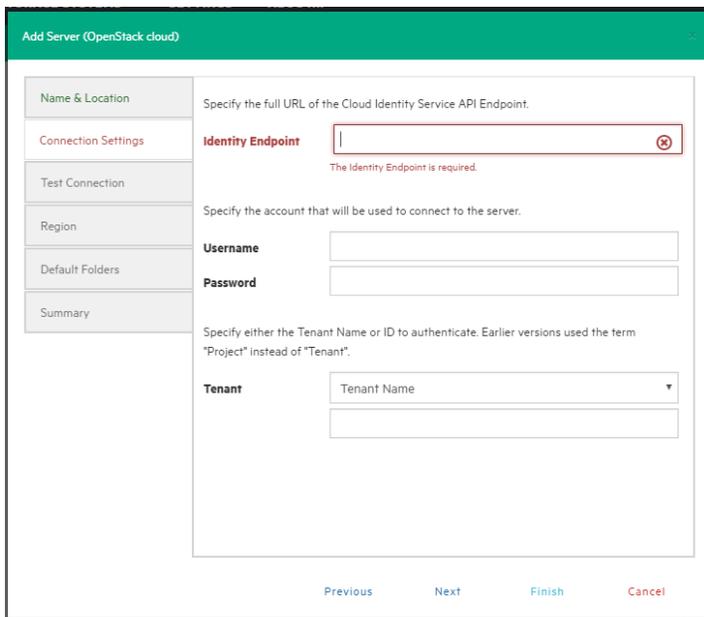
Add server (OpenStack, HPE Helion, Rackspace, Azure, S3 Compatible) - Connection settings

Adding Linux and FreeBSD servers

The procedure for adding Linux and FreeBSD servers are similar to adding an ESXi host, except for the **SSH/HPE VM Explorer Agent** and **Advanced Settings**, which are only used by ESXi hosts. For more information, see also Adding an ESXi server, on page 26.

Modifying a server

Depending on your needs, you can easily modify the settings of an existing server in HPE VM Explorer. To do so, go to the **Datacenter** view, right-click the server you want to modify and then point to **Edit Server...** on the shortcut menu. Then, configure the **Edit Server (ESXi)** wizard accordingly. For more information on how to configure a server, see Adding a Hyper-V server, on page 32.

Refreshing one or all servers

To refresh a single server, go to the **Datacenter** view, right-click the desired server and then point to **Refresh** on the shortcut menu. To refresh multiple servers, go to the **Datacenter** view and click **Refresh All**.

> **NOTE:** Creating a task or running a process involving one or several servers will cause the server(s) to refresh automatically.

Viewing server or Virtual Machine information

In HPE VM Explorer, you can always check whether your server or Virtual Machine settings are compliant with your needs.

Server overview

In the **Overview** tab of the **<server name>** screen, you can see general information about the host, the type of server and the number of sockets:

Server - Overview

Inbound/Outbound view

In the **Scheduled Backups** tab of the **<server name>** screen, you can view all the tasks connected to the current server:

Inbound/Outbound view

Instant Recovery status

In the **Instant Recovery Status** tab of the **<server name>** screen, you can check the connection status between the Hypervisor and HPE VM Explorer's NFS server (this feature is only available for ESXi):
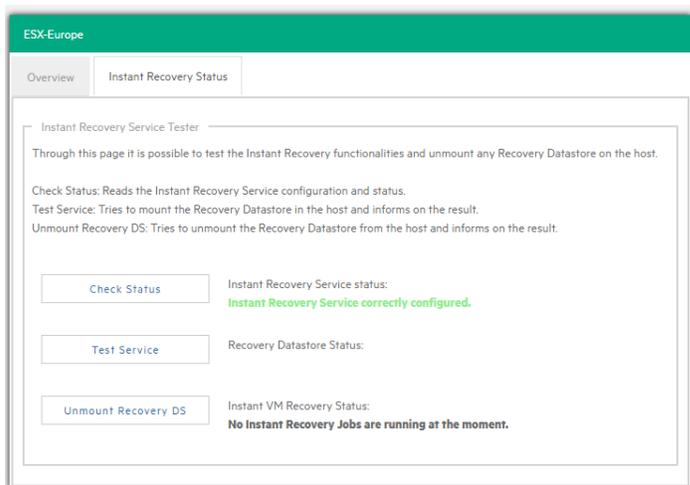
Server - Instant recovery status

The **Instant Recovery Status** tab provides you with the following options:

- **Check Status** updates the status of the data and gives you an overview of the possible and current operations.

  You can read the information of the datastore registered through the HPE VM Explorer NFS Server and if any backup test is running.

- **Test Service** mounts the HPE VM Explorer NFS datastore (used for automated backup test) to the host and check if basic communication is possible.

- **Unmount Recovery DS** runs the unmounts of the HPE VM Explorer NFS datastore. If any backup test is running, this command will fail as the host will refuse it.

> **NOTE:** You can use the **Unmount Recovery DS** feature only if you have enabled the Instant Recovery Service, in the *<user name>* **> Settings > Instant Recovery Service** section.

Viewing Virtual Machine information

To have an overview of a Virtual Machine, expand the servers on the **Datacenter** view, click the desired Virtual Machine and then see all the desired information in the *<Virtual Machine Name>* screen.
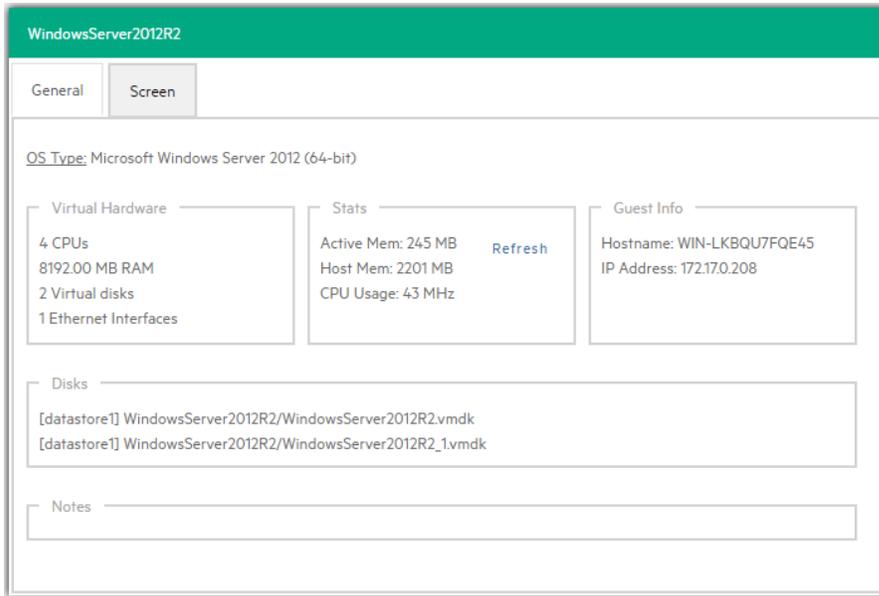
Virtual Machine information

You can also request a screenshot of the VM in the **Screen** tab. Just press **Refresh** to update.

You can right-click a VM in the **Datacenter** tree and then, in the **Snapshots for *<Virtual Machine Name>*** screen, you can run VM related actions, such as power on/off, backup/replication, locate VM files or manage the snapshots.
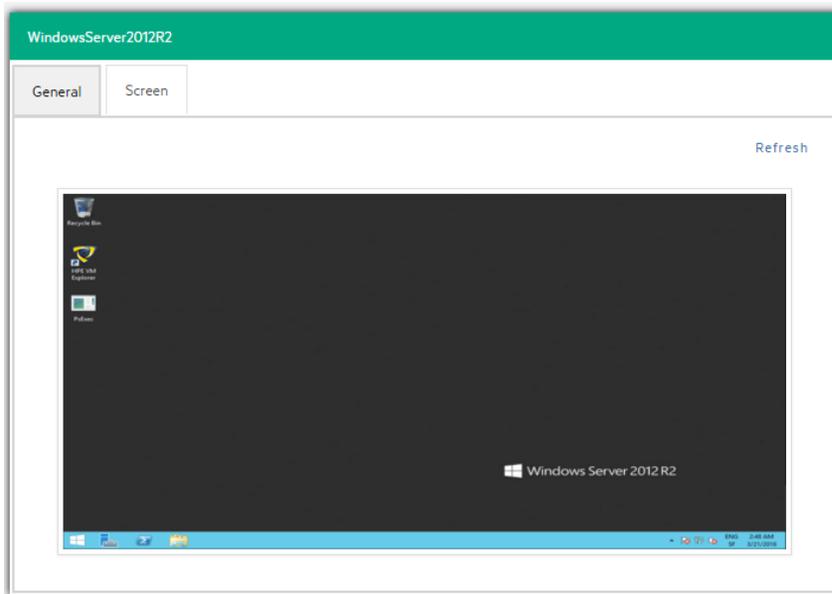
VM screenshot

Clicking **Snapshots Manager** enables you to see the snapshot tree of the selected VM. Here you can navigate through and delete one or more snapshots.

Click **Create Snapshot** to take a new snapshot. You can set the option for *quiesce* and *memory snapshot*. Give your snapshot a name and a meaningful description.
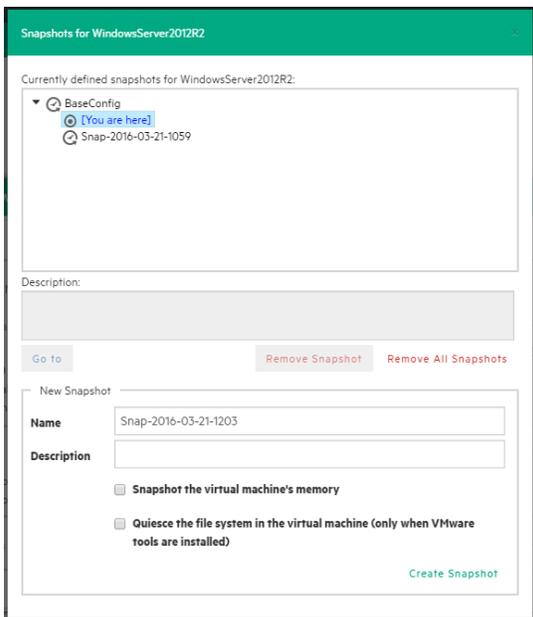
VM Snapshot Manager

When selecting the **Snapshot Manager** option, a new dialog will appear, showing the snapshot tree of the selected VM. You can navigate through the snapshots, delete a specific snapshot or both.

Upload Manager

The **Upload Manager** tab of the **<server name>** screen is only available for Amazon S3. Here you can have an overview of the multipart uploads currently active with the Amazon S3 cloud:
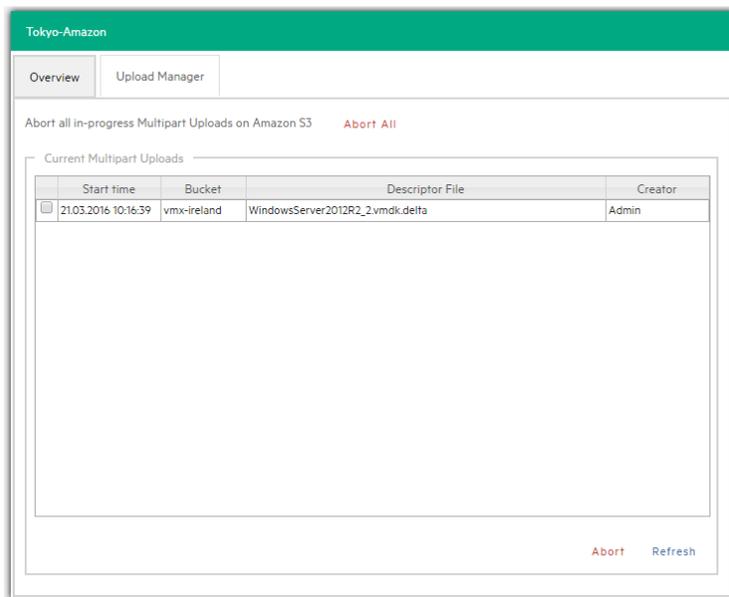
Server - Upload Manager

Abort All stops and deletes all multi-part upload jobs currently running.

The **Current Multipart Uploads** form displays a list of all running, uploaded jobs. If you select one or more jobs, you can stop them without influencing the other jobs. This allows you to stop a job that may be blocked or malfunctioning.

Refresh is not automatic and must be activated by clicking **Refresh**, even the first time.

Deleting a server

In HPE VM Explorer, you can delete a server you no longer need. To do so, go to the **Datacenter** view, right-click the server that you want to delete and then point to **Remove** on the shortcut menu. Then, in the **Confirm** dialog box, click **OK**.

> **CAUTION:** Removing and then adding the same host (with the same parameters and server name) will require you to refresh all Scheduled Tasks related to that server. For more information, see Scheduling Tasks, on page 106.

Configure the SAN Infrastructure

If your network has EMC² ScaleIO, HPE StoreVirtual VSA or HPE 3PAR StoreServ systems installed, you can add references to these Storage Area Network (SAN) infrastructures to check infrastructure information and execute backups with Storage Snapshot. For more details, see Backing Up One or Multiple Virtual Machines, on page 77.

You can add a SAN infrastructure and you can modify or delete an existing one. For more information, see Modify a SAN infrastructure, on page 52, and Delete a SAN infrastructure, on page 52.

Add a SAN infrastructure

To add a SAN infrastructure:

1. Go to **Storage Systems**, point to **SAN Infrastructure** and then, in the **Welcome to the SAN Infrastructure Manager** screen, click **Add new SAN**. You can also click **Add new SAN** on the **SAN Infrastructure** view or right-click a free area in the **SAN Infrastructure** view and point to **Add new SAN** on the shortcut menu.
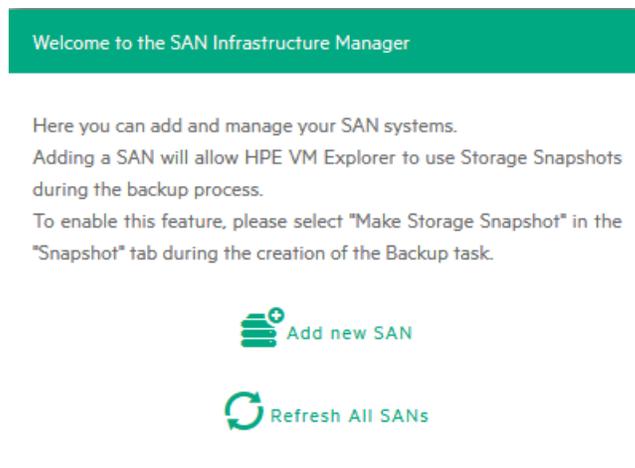
Welcome to the SAN Infrastructure Manager screen

2. In the **Add a new SAN** screen, select whether you want to add a new ScaleIO, an HPE StoreVirtual or an HPE 3PAR StoreServ storage system. Depending on your selection at this stage, the procedures available to you differ.
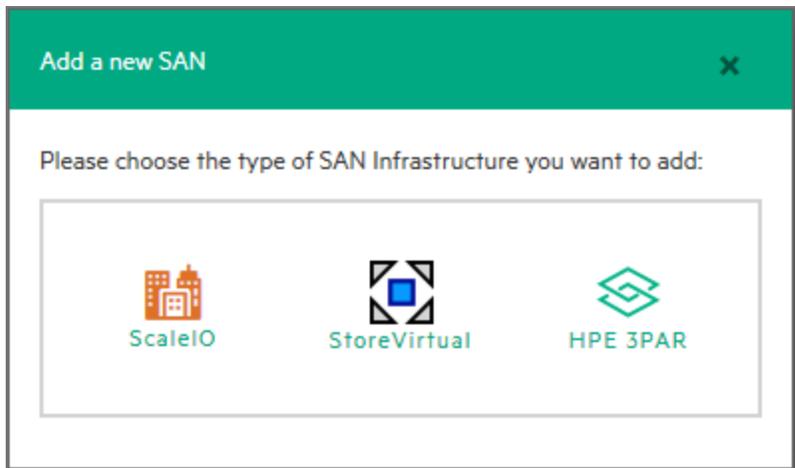
Add new SAN system

HPE VM Explorer supports the following SAN infrastructures:

- EMC Scale IO—for more infromation, see Working with EMC ScaleIO SAN storage, below

- HPE StoreVirtual—for more infromation, see Working with HPE StoreVirtual VSA SAN systems, on page 46

- HPE 3PAR StoreServ—for more infromation, see Working with HPE 3PAR StoreServ storage, on page 47

Working with EMC ScaleIO SAN storage

With HPE VM Explorer, you can perform backup&restore operations to EMC ScaleIO, which enables you to convert direct-attached storage into shared block storage.EMC ScaleIO uses existing host-based internal storage to create a scalable SAN.

Add an EMC ScaleIO SAN storage

To add an EMC ScaleIO SAN system, in the **Add a new SAN** screen, click **ScaleIO** and configure the **Add a new SAN** wizard.

1. In the **Add a new SAN** wizard, in the **Name & Connection Settings** screen, complete the boxes, as required. When finished, click **Next**.
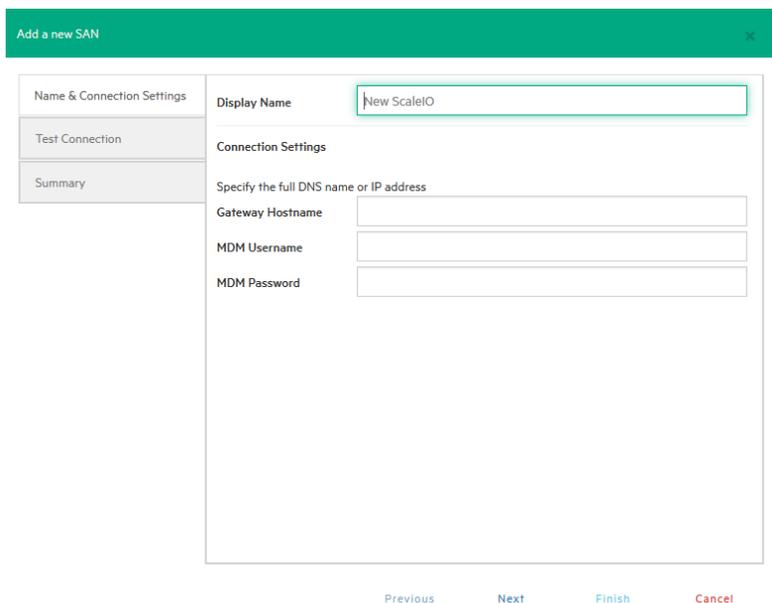
Add ScaleIO system - Name & Connection Settings

2. In the **Test Connection** wizard screen, you can test the connectivity and uniqueness of your newly configured ScaleIO system. If the test is successful, click **Next**.

3. In the **Summary** wizard screen, you can see the summary of your newly configured ScaleIO system. At this stage, you can always go back and reconfigure the details of your SAN infrastructure. When finished, click **Save**. Your newly added SAN infrastructure is available in the **SAN infrastructure** view.

You can also modify and delete your existing EMC ScaleIO SAN SAN infrastructure. For more information, see Modify a SAN infrastructure, on page 52 and Delete a SAN infrastructure, on page 52.

View EMC ScaleIO SAN storage details

To view the EMC ScaleIO SAN storage details:

1. Go to *Storage Systems > SAN Infrastructure*.

2. In the **SAN Infrastructure** view, click the desired EMC ScaleIO SAN storage. All the information related to your EMC ScaleIO SAN storage is displayed in the *<EMC ScaleIO SAN server name>* screen. You can see the general information of your storage, as well as the system capacity, and you can also modify and remove the selected EMC ScaleIO SAN storage.

View EMC ScaleIO SAN SDC details

To view the EMC ScaleIO SAN SDC details:

1. Go to *Storage Systems > SAN Infrastructure*.

2. In the **SAN Infrastructure** view, expand the EMC ScaleIO SAN storage and the **SDC** knot and click the desired SDC to view its details.

View EMC ScaleIO SAN volume details

To view the EMC ScaleIO SAN volume details:

1. Go to **Storage Systems > SAN Infrastructure**.
2. In the **SAN Infrastructure** view, expand the EMC ScaleIO SAN storage and the **Volumes** knot and then click the desired volume to view its details.

Working with HPE StoreVirtual VSA SAN systems

With HPE VM Explorer, you can perform backup&restore operations to HPE StoreVirtual VSA SAN systems, which provide you with affordable storage for your virtualized infrastructure. HPE StoreVirtual VSA transforms your server's internal or direct-attached storage into a scalable, shared storage array, without dedicated storage.

Add an HPE StoreVirtual VSA SAN system

To add an HPE StoreVirtual VSA SAN system, in the **Add a new SAN** screen, click **HPE StoreVirtual** and configure the **Add a new SAN** wizard.

> **NOTE:** For the 6.7 release of HPE VM Explorer, the HPE StoreVirtual implementation only supports ESXi systems. Hyper-V systems will be supported at a future date.

1. In the **Name & Connection Settings** wizard screen, type a meaningful name for your new HPE StoreVirtual system in the **Display Name** box. Also, type the full DNS name or IP address of your HPE StoreVirtual system in the **Cluster Hostname** box, as well as your HPE StoreVirtual VSA username and password. When finished, click **Next**.
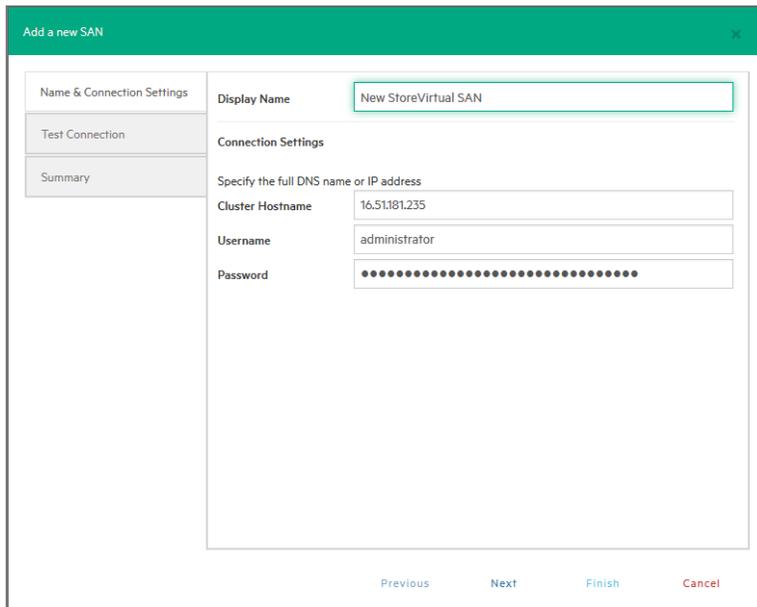
Add HPE StoreVirtual VSA system – Name & Connection Settings

2. In the **Test Connection** wizard screen, wait until the system checks if you can connect to HPE StoreVirtual and makes sure there is no duplicate Management Group. If the test is successful, click **Next**.

3. In the **Summary** wizard screen, you can see the summary of your newly configured HPE StoreVirtual system. At this stage, you can always go back and reconfigure the details of your SAN infrastructure. When finished, click **Save**. Your newly added SAN infrastructure is available in the **SAN infrastructure** view.

> **NOTE:** Whenever you store a VM on HPE StoreVirtual VSA storage, storage snapshots are made automatically and no additional action is needed from your side.

You can also modify and delete your existing HPE StoreVirtual VSA SAN storage. For more information, see Modify a SAN infrastructure, on page 52 and Delete a SAN infrastructure, on page 52.

View HPE StoreVirtual VSA storage details

To view the HPE StoreVirtual VSA storage details:

1. Go to *Storage Systems > SAN Infrastructure*.

2. In the **SAN Infrastructure** view, click the desired HPE StoreVirtual VSA storage. All the information related to your HPE StoreVirtual VSA storage is displayed in the *<HPE StoreVirtual VSA server name>* screen. You can see the general information of your storage, as well as the system capacity, and you can also modify and remove the selected HPE HPE StoreVirtual VSA storage system.

View HPE StoreVirtual VSA server information

To view the HPE StoreVirtual VSA server details:

1. Go to *Storage Systems > SAN Infrastructure*.

2. In the **SAN Infrastructure** view, expand the HPE StoreVirtual VSA SAN storage and the **Servers** knot and then click the desired server to view its details.

View HPE StoreVirtual VSA cluster information

To view the HPE StoreVirtual VSA cluster details:

1. Go to *Storage Systems > SAN Infrastructure*.

2. In the **SAN Infrastructure** view, expand the HPE StoreVirtual VSA SAN storage and the **Clusters** knot and then click the desired cluster to view its details.

Working with HPE 3PAR StoreServ storage

VM Explorer can perform storage snapshot backup operations from HPE 3PAR StoreServ Storage.

HPE 3PAR StoreServ Storage leverages multi-tenant design and uses hardware for deduplication, all in a single, tier-1 storage system especially designed for data security and availability.

Add an HPE 3PAR StoreServ storage

To add an HPE 3PAR StoreServ storage, in the **Add a new SAN** screen, click HPE 3PAR StoreServ and configure the **Add a new SAN** wizard.

> **NOTE:** To enable communicaton with HPE VM Explorer, make sure HPE 3PAR StoreServ WSAPI HTTPS communication is enabled.

In the **Name & Connection Settings** wizard screen, type a meaningful name for your new HPE 3PAR StoreServ system in the **Display Name** box. Also, type the hostname of your server, as well as your HPE 3PAR StoreServ username and password. When finished, click **Next**.

1.

2. In the **Test Connection** wizard screen, wait until the system checks if you can connect to your newly added HPE 3PAR StoreServ storage system. If the test is successful, click **Next**.

3. In the **Summary** wizard screen, you can see the summary of your newly added HPE 3PAR StoreServ system. At this stage, you can always go back and reconfigure the details of your SAN infrastructure, if needed. When finished, click **Save**. Your newly added HPE 3PAR StoreServ storage is available in the SAN infrastructure view.

View the HPE 3PAR StoreServ storage details

To view the HPE 3PAR StoreServ storage details:

1. Go to *Storage Systems > SAN Infrastructure*.

2. In the **SAN Infrastructure** view, click the desired HPE 3PAR StoreServ storage. All the information related to your HPE 3PAR StoreServ storage is displayed in the *<HPE 3PAR StoreServ server name>* screen. You can see the general information of your storage, as well as the system capacity, and you can also modify and remove the selected HPE 3PAR StoreServ

storage system.

New HPE 3PAR StoreServ storage

✎ Edit　↻ Refresh　🗑 Remove

General

Identifier: 120090

Name: 3PAR_MainStorage

IP Address: 172.12.0.40

Device Model: HP_3PAR 8440

Serial Number: CZX27811G7

System Version: 3.2.2.612

☑ Virtual Copy

Total Nodes: 2

Online Nodes: 2

Timezone: Europe/Paris

System Capacity

90.6%

24936 GiB

9.4%

Allocated: 2348 GiB

Free: 22588 GiB

Failed: 0 GiB
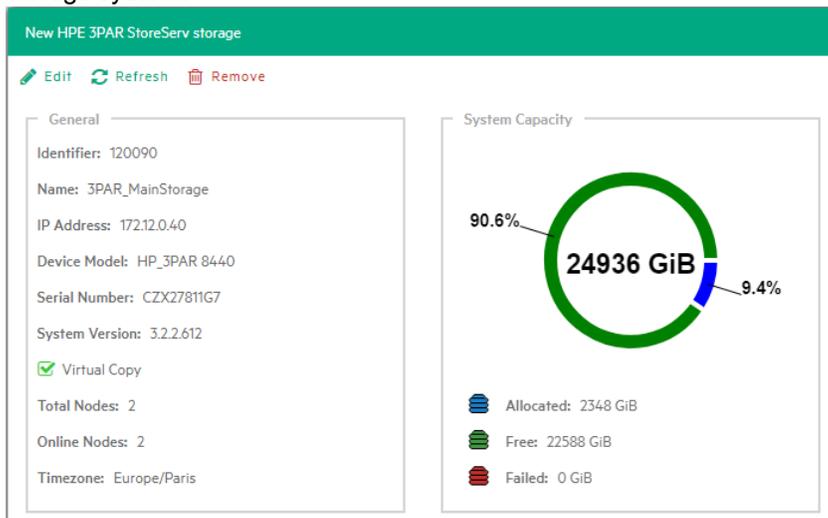
View the HPE 3PAR StoreServ host details and exports

To view the HPE 3PAR StoreServ hosts details and exports:

1. Go to **Storage Systems > SAN Infrastructure**.

2. Browse the desired HPE 3PAR StoreServ storage and expand the **Hosts** knot. Then, click the Host the information of which you want to see. All the information related to your HPE 3PAR StoreServ host storage and the existing exports is displayed in the **<HPE 3PAR StoreServ hostname>** screen, in the respective tabs.

View the HPE 3PAR StoreServ volume details, exports and snapshots

To view the HPE 3PAR StoreServ volume details, exports and snapshots:

1. Go to **Storage Systems > SAN Infrastructure**.

2. Browse the desired HPE 3PAR StoreServ storage and expand the **Volumes** knot. Then, click the Volume the information of which you want to see. All the information related to your HPE 3PAR StoreServ Volume details, exports and snapshots is displayed in the **<HPE 3PAR StoreServ volume name>** screen, in the respective tabs.

You can also modify and delete your existing HPE 3PAR StoreServ storage SAN infrastructure. For more information, see Modify a SAN infrastructure, below and Delete a SAN infrastructure, below.

Modify a SAN infrastructure

To modify your SAN infrastructure (ScaleIO, HPE StoreVirtual or HPE 3PAR StoreServ), right-click your SAN System host entry in the SAN Infrastructure tree, point to **Edit SAN...** on the shortcut menu and then modify the SAN Infrastructure settings accordingly. You can also click the SAN system you want to modify in the **SAN Infrastructure** view and then click **Edit** in the **<SAN system name>** screen. The procedure is the same as adding a SAN infrastructure. For more information, see Add a SAN infrastructure, on page 43.

Delete a SAN infrastructure

To delete your SAN infrastructure (ScaleIO, HPE StoreVirtual or HPE 3PAR StoreServ), right-click your SAN System host entry in the SAN Infrastructure tree and point to **Remove SAN** on the shortcut menu. In the confirmation message, click **Yes**.

Configure tape infrastructure

With HPE VM Explorer you can copy your backups to tape. See Supported tape libraries/autoloaders, on page 11 for a full list of supported tape devices.
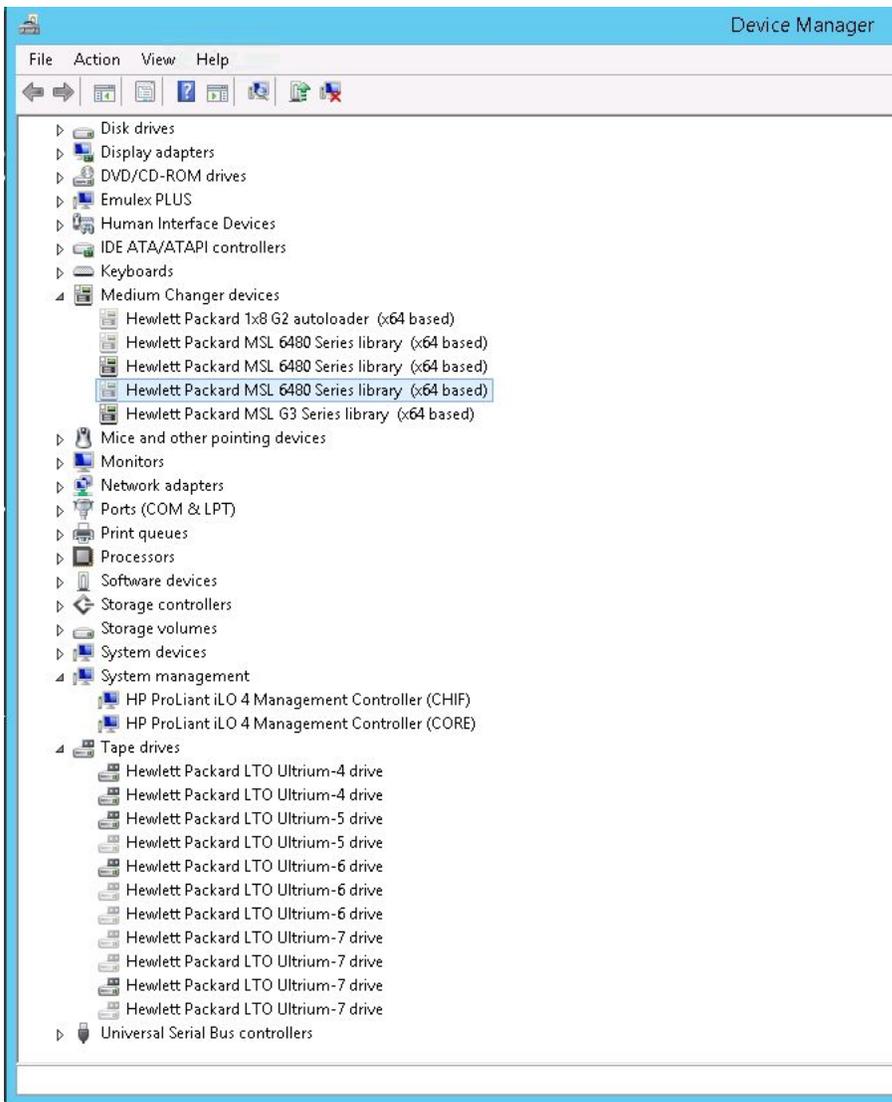
Windows Device Manager

HPE VM Explorer automatically recognizes tape devices visible to the Windows computer on which they are installed. In Windows Device Manager, you can find tape libraries under the **Medium Changer devices** and tape drives under the **Tape drives** group.

We recommend that you install the latest device drivers from your hardware provider, especially if HPE VM Explorer does not detect the tape library and Windows Device Manager displays it as Unknown Medium Changer.
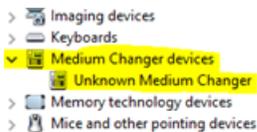
Unknown Medium Changer in Windows Device Manager

Before running a tape backup for HPE VM Explorer, you need to set up the libraries (with drives, media and media pools). You can find the latest drivers for HPE StoreEver tape library/autoloader/drive family

and HPE D2D Virtual Tape Libraries (VTL) by clicking here. Also, make sure your tape backup environment is set up.

To access the **Tape Infrastructure** screen, go to ***Storage Systems > Tape Infrastructure*** and click **Rescan Infrastructure**.
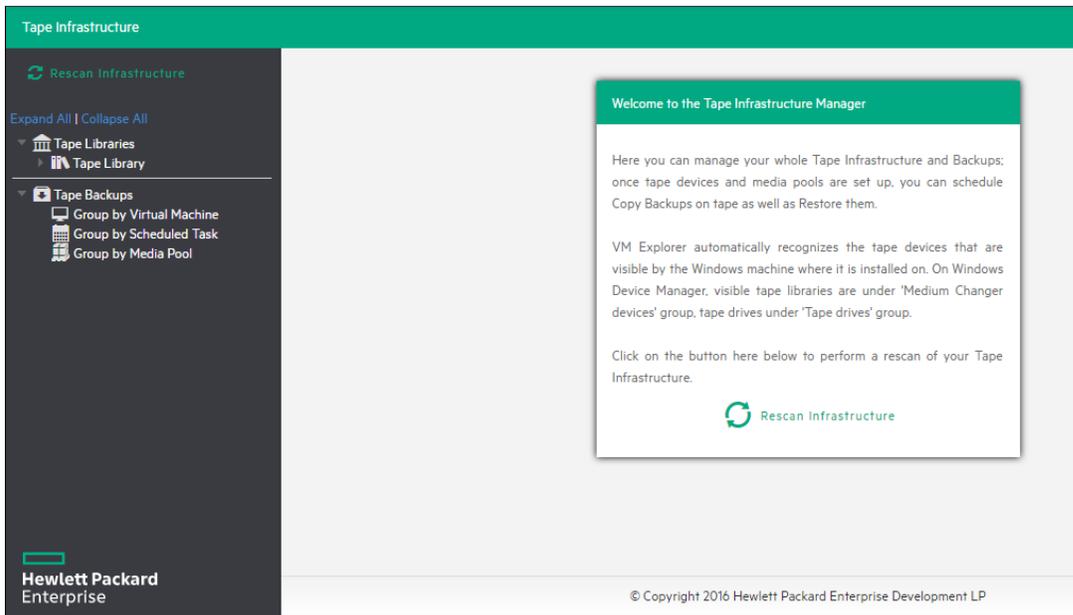
Rescan Tape Infrastructure

About tape libraries

On the left hand side, the **Tape Library** view displays the detected devices composing your infrastructure. The tape library is divided into:

 Drives

 Media

 Media Pools
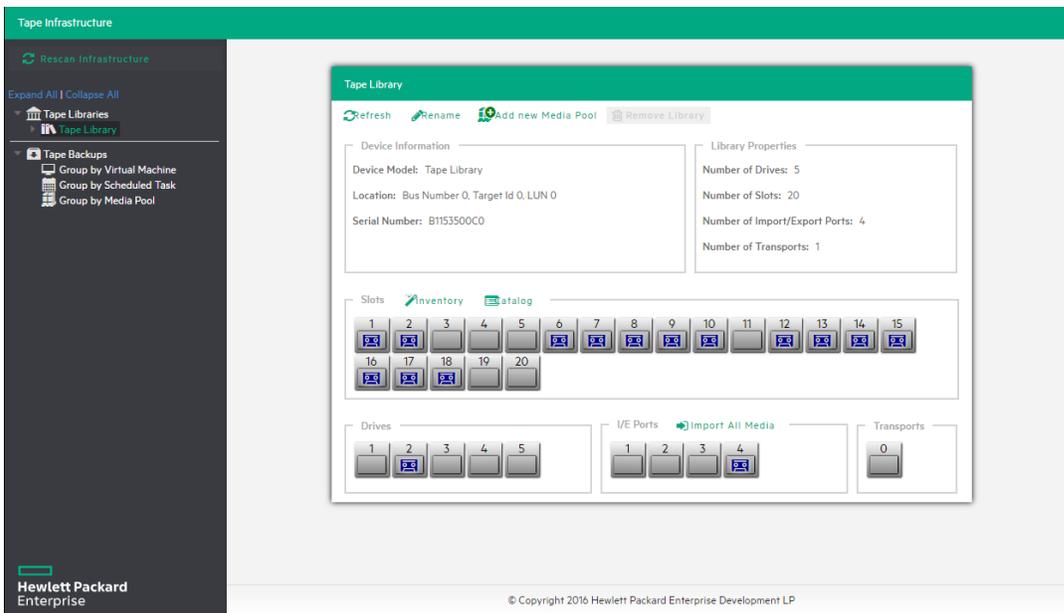
Tape Library overview

About drives

A drive is the physical part of a tape library that enables you to read and write data from/to a tape media. Clicking this item enables you to see some information about the drive and to enable/disable it, which will cause HPE VM Explorer to include/exclude it from the pool of drives usable in the backup procedures.

About tape media

The media item shows all the tape media/cartridges recognized by this tape library. There are:

- Online media: list of media currently and physically present in the tape library.
- Offline media: list of known media present in the tape library, but not inserted.

You can perform the following operations on the media:

Operation	Description
Move to media pool	You can logically include a tape in a media pool. You can move the media in the free or custom media pools. For more information, see About media pools, on the next page.
Inventory	Prepare new media for use with HPE VM Explorer or check if new media is already recognized.
Catalog	Makes the inventory of the tape media and scans all its contents for existing backups. HPE VM Explorer reads the entire tape to catalog all the backups copied in it. This operation can take some time.

Import	If the media is in an I/E port, you can import it and HPE VM Explorer will move the media to the first available empty slot.
Export	Use this option to move the tape media from its slot to an I/E port, if you want to physically remove media from the library.
Eject	Enables you to move media from the drive to the first available empty slot.
Erase	Click to delete all data written on the tape. You can choose between Short erase (fast) or Long erase (slow). Warning: Clicking Erase removes all the backups on the tape media and from the catalog.
Mark as Free	Click to mark the media ready to use and to overwrite its content. Warning: All the backups on this tape media will be deleted from the catalog. If you use the Catalog action before reusing the media, you can still recover the existing backups.
Remove from catalog	If your media is offline, you can remove it from the catalog. Warning: All the backups on this tape media will be deleted from the catalog. If you later decide to re-import the media, you can use the Catalog action before reusing the media to recover existing backups.
Details	Click to see information about the media and which HPE VM Explorer backups are saved on it.

About media pools

A media pool is a container that helps to organize the media included in a tape infrastructure.

HPE VM Explorer defines 3 types of system media pools that can neither be modified nor used as targets for your backups:

- **Free**–This pool contains all the media from the system, marked as free and usable. You can move the media to populate other custom media pools.

- **Unrecognized**–This pool consists of unrecognized tape media the content of which is still unknown. You can perform the **Inventory** operation to make the media usable in the **Free Media Pool** or the **Catalog** operation, in case you want to recover existing HPE VM Explorer backups.

- **Imported**–This media pool consists of tape media containing existing backups recognized during a **Catalog** operation (for example, media previously removed from the catalog or previously used by another Tape Library).

  > **NOTE:** In order to perform backups on tape, you can create custom media pools.

- **Custom**–In this custom media pool you can define the list of media and the specific retention rules for the backups.

Creating a custom media pool

You can create a new custom media pool by right-clicking **Media Pools** and pointing to **Add Media Pool**. Then, complete the **Add new Media Pool** wizard, as follows:

1. In the **Name** wizard screen, type a name and a meaningful description for your pool. When finished, click **Next**.
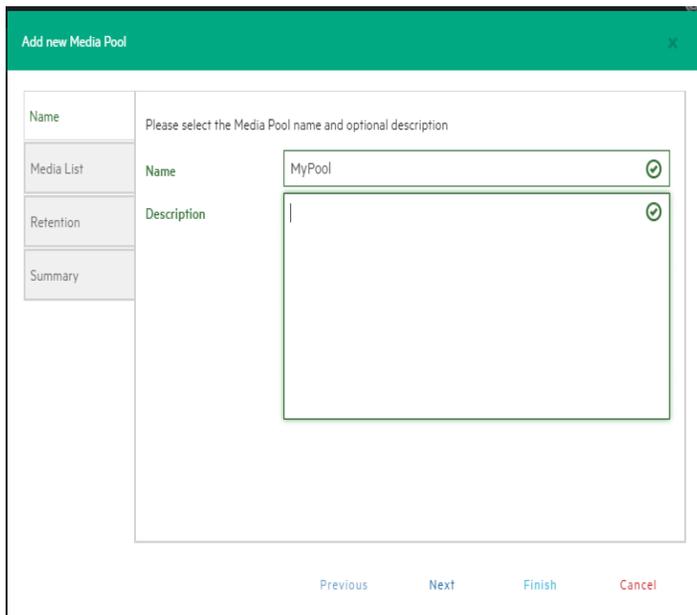
Add Media Pool - Name

2. In the **Media List** wizard screen, click **Add** to select the free tape media from the **Free** media pool. You can also remove existing media and move it to the free media pool by selecting it and clicking **Remove**. Select the **Automatically add media from the 'Free' Media Pool when required** checkbox if you want HPE VM Explorer to include the first free tape from the free media pool if a backup needs space that is unavailable in the media already present in this pool. When finished, click **Next**.
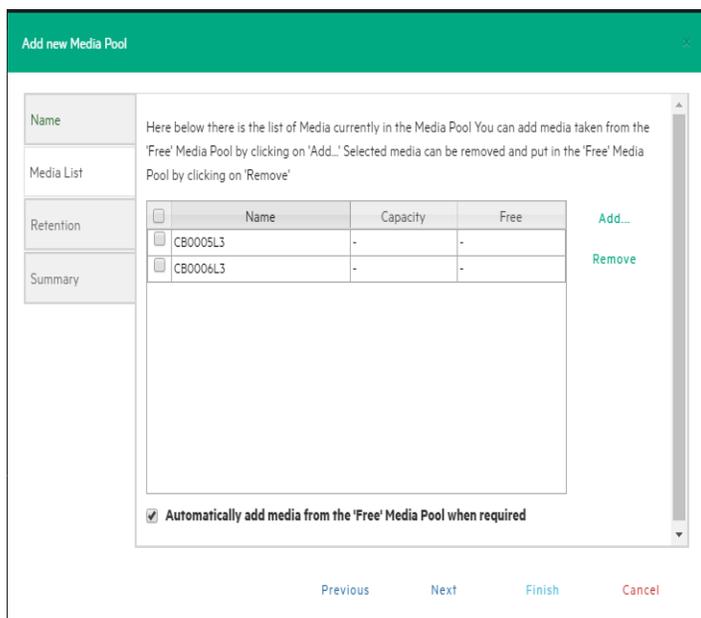
Add Media Pool - Media List

3. In the **Retention** wizard screen, set the rules for using/reusing the media, as follows. When finished, click **Next**.

    - Under **Media reutilization**–select whether you want to reuse the same media in subsequent scheduled backup sessions or if you want to use different media every session.

    - Under Data retention policy–select the desired media overwrite policy.

	Name	Media Pool	Capacity	Free
□	CB0005L3	Free	-	-
□	CB0006L3	Free	-	-
□	CB0001L3	Free	-	-

Add Tape Media from 'Free' Media Pool

Please select the media from the 'Free' Media Pool you want to add to the current Media Pool.

OK   Cancel
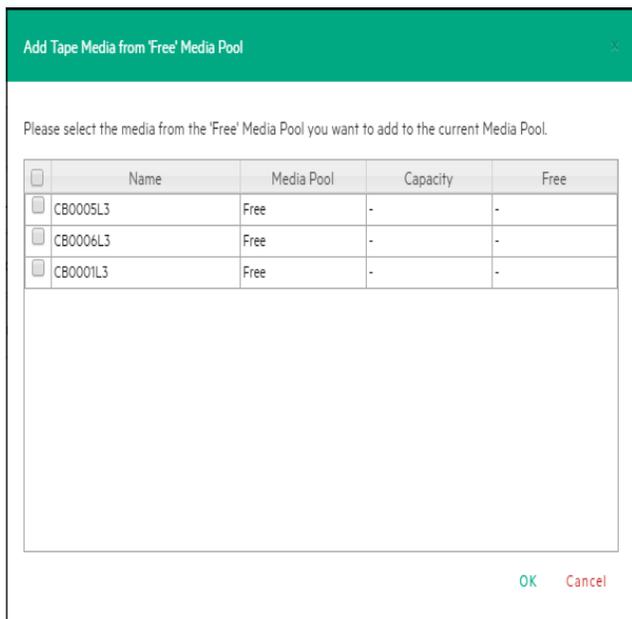
Add Media Pool - Free pool

4. The **Summary** wizard screen displays the details of your newly configured media pool. At this stage, you can go back and make any necessary changes. When finished, click **Save** to add your media pool to your **Tape Infrastructure** tree. You can change your media pool settings at any time by right-clicking your media pool host entry in the **Tape Infrastructure** tree and pointing to the **Edit** menu.

Add Media Pool - Summary

Tape backup copies

You can find all your backups saved with HPE VM Explorer in your Tape Infrastructures. You can show them grouped by:

🖥 Virtual Machine

📅 Scheduled Task

🗄 Media Pool

Right-clicking the desired backup enables you to view its details or to start a restore procedure by selecting **Restore backup from Media…** and then completing the **Tape Restore** wizard.
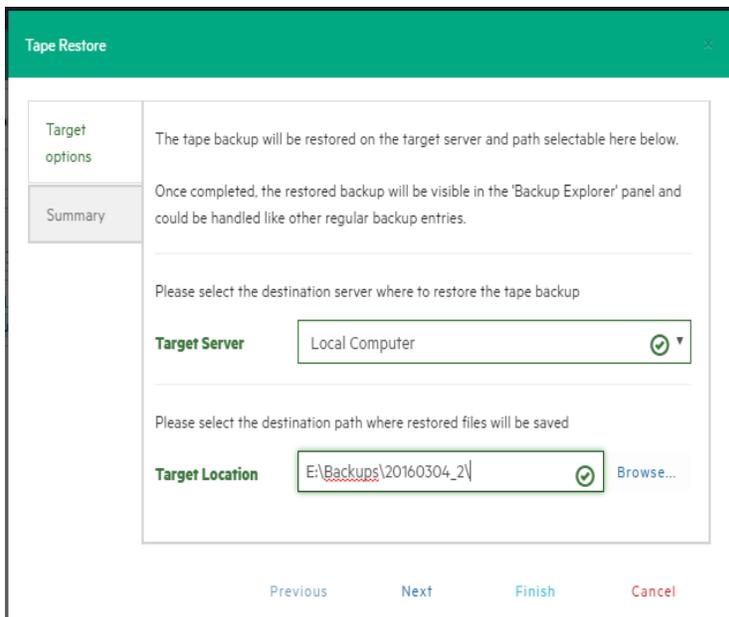
Tape Restore - Target options

Configure Network Drives

As the HPE VM Explorer service runs within a different account than the logged on account, it has no direct access to the shares mounted to your account. Therefore, network drives (used as a backup target) must be configured within **VM Explorer** to let the service mount them automatically.

To configure Network Drives:

1. Go to **Settings**.
2. Click **Network Drives** from the **User** menu.
3. Open the **Network Drives** screen.
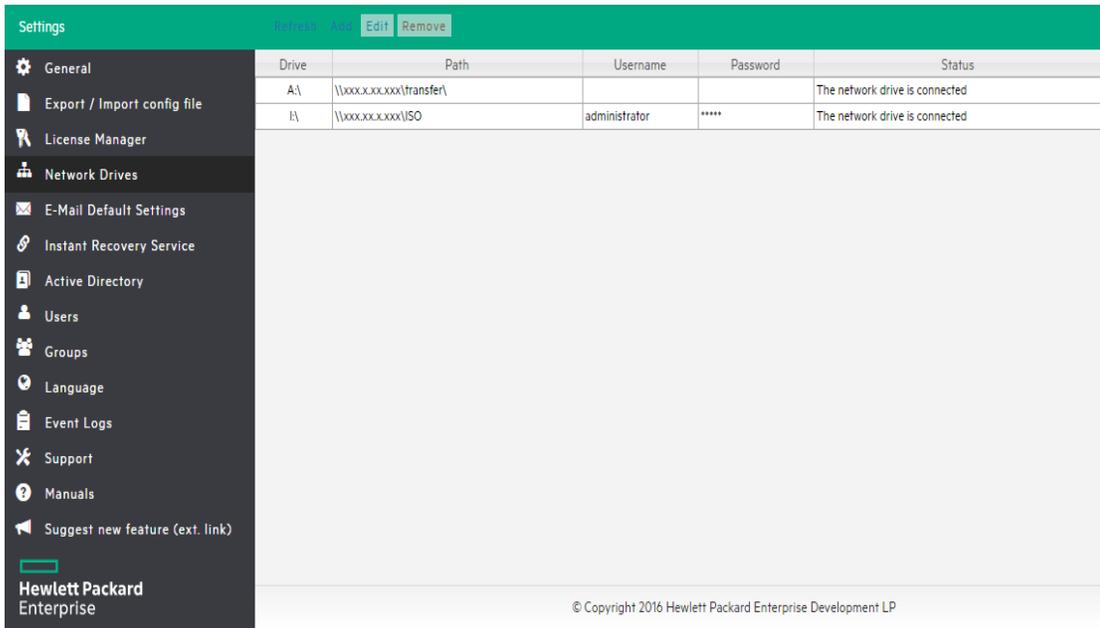
Network Drives screen

4. On the **Network Drives** screen, click **Add** to add a new network drive. Click **Edit** to edit an existing network drive.

   The **Add a network drive** wizard opens.

5. On the **Location** tab, select a drive letter for the network drive. If you have already mapped some network drives with letters, those letters are not available.

6. Enter the correct network drive path in the **Path** box.
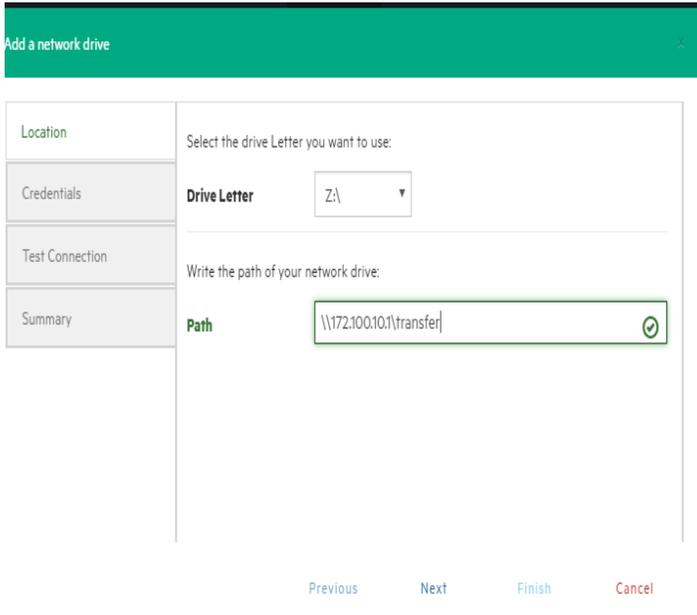
Network Drive - Location

7. Click **Next** and then, on the **Credentials** tab, provide user credentials if the network drive uses

them. If it does not, select **Do not use credentials**.

Network Drive - Credential

8. Click **Next**.

   The **Test Connection** tab opens. A connection test with the network drive is performed, using your parameters.

Network Drive - Test Connection

9. Click **Next**. In the **Summary** tab, verify all the parameters and click **Save**.
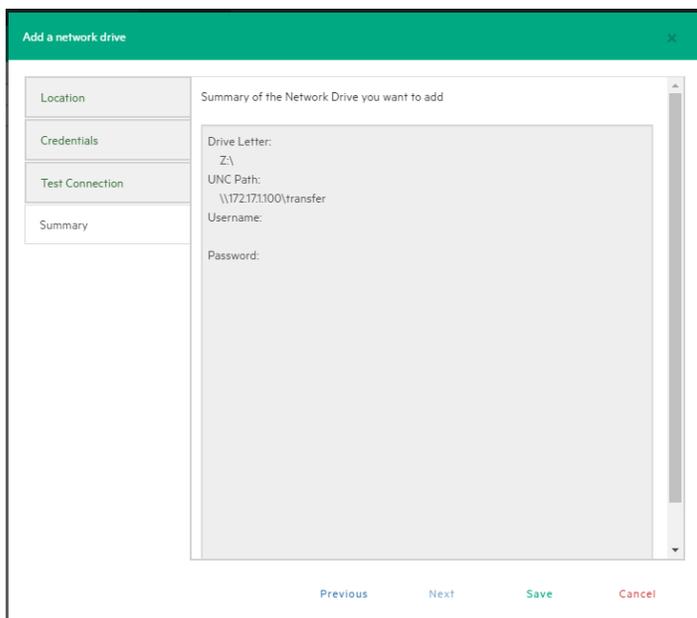
Network Drive - Summary

Working with deduplicating storage target

With HPE VM Explorer you can use HPE StoreOnce Catalyst as a deduplicating storage target. This enables you to eliminate duplicate copies of repeating data and to optimize storage space.

Adding an HPE StoreOnce Catalyst storage target

To add HPE StoreOnce Catalyst as a storage target:

1. Click **Storage Systems**, point to **Deduplicating Storage** and then, in the **Welcome to the Deduplicating Storage Manager** screen, click **Add a new HPE StoreOnce Catalyst storage**. You can also click **Add a new HPE StoreOnce Catalyst** in the **Deduplicating Storage** view.
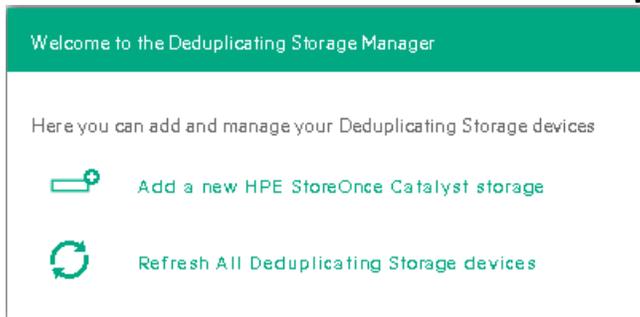
Welcome to the Deduplicating Storage Manager screen

2. In the **Name & Connection Settings** wizard screen, type the name of the HPE StoreOnce Catalyst storage target you want to add, as well as the address, client user name and password (the connection can be established through an Ethernet adapter or through a Fiber Channel

adapter/address). Also, select whether you want your connection to the HPE StoreOnce Catalyst storage target to be of the WAN (Wide Area Network) type, which is used to enable payload checksum. Payload checksums are recommended when the HPE StoreOnce Catalyst server resides on a different network segment, for example in a remote data center. You can add the same HPE StoreOnce Catalyst server multiple times using different HPE StoreOnce Catalyst Client Permissions. For more information on HPE StoreOnce Catalyst Client Permissions, see the HPE StoreOnce Catalyst documentation. When finished, click **Next**.

The Name & Connection Settings wizard screen

> **NOTE:** If HPE StoreOnce Catalyst Client Permissions are not set up, you gain access by default to the stores that have **All Clients** access.

3. In the **Test Connection** wizard screen, you can see whether the connection test to your deduplicating storage target is successful. When finished, click **Next**.
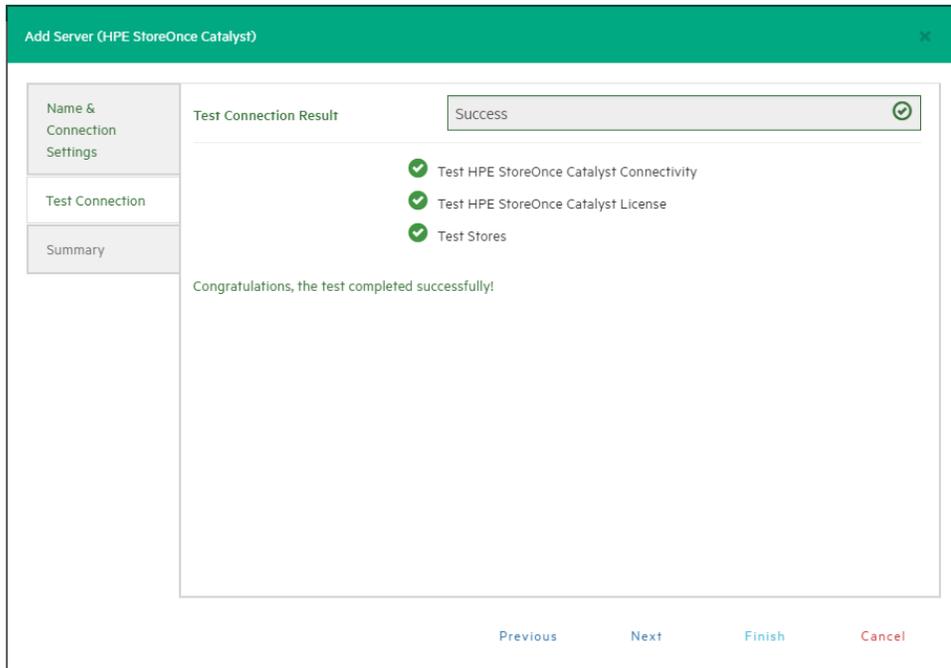
The Test Connection wizard screen

4. In the **Summary** wizard screen, you can see the details of your newly configured HPE StoreOnce Catalyst storage target. When finished, click **Save**. Your newly added HPE StoreOnce Catalyst storage target is available in the **Deduplicating Storage** view.
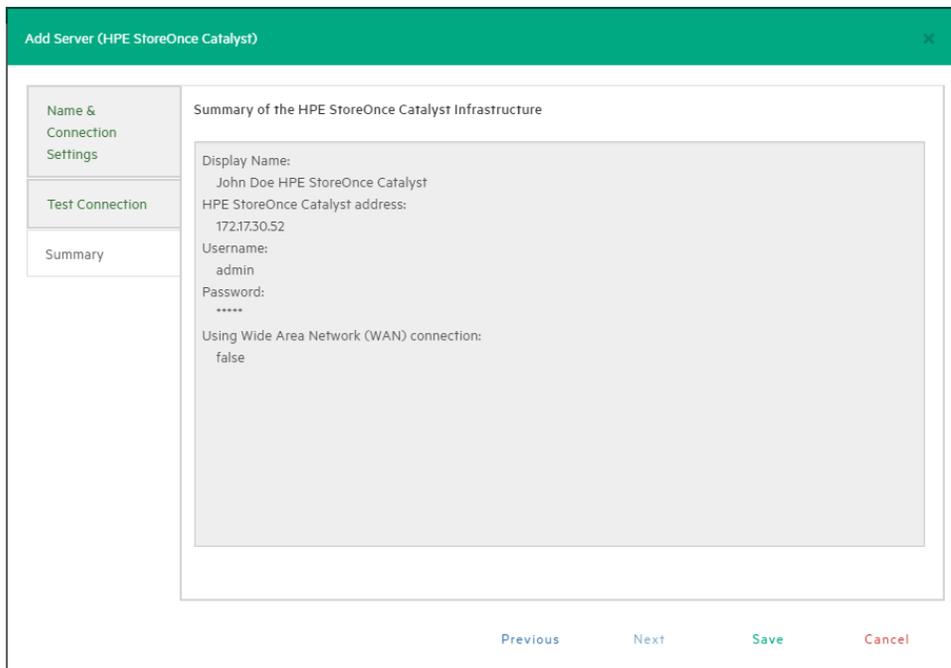
The Summary wizard screen

> **NOTE:** If no Client Permission settings are set, adding an HPE StoreOnce Catalyst storage target will automatically add all its existing stores to HPE VM Explorer by default. If Client Permissions are set, only the stores assigned to you will be added. To see the updated information of your HPE StoreOnce Catalyst storage system(s) and store(s) created via HPE VM Explorer, you can use the catalog feature. For more information on the catalog feature, see Rebuilding the list of HPE StoreOnce Catalyst backups, on page 71.

Once you have completed adding an HPE StoreOnce Catalyst storage target, you can perform backups, restores and copies.

Performing a backup on HPE StoreOnce Catalyst

To perform a backup on an HPE StoreOnce Catalyst storage target:

1. Go to the **Datacenter** view and, in the **Welcome to HPE VM Explorer** screen, click **Backup a Virtual Machine**.
2. In the **Virtual Machine Backup** dialog box, in the **Source** section, select the desired Host and VM and then, in the **Target** section, select the desired HPE StoreOnce Catalyst (deduplicating storage) backup target. Then, configure the desired backup options accordingly. For more information on performing a backup, see Backing Up One or Multiple Virtual Machines, on page 77.

   > **NOTE:** HPE StoreOnce Catalyst also supports both full and incremental backups, but not encrypted or compressed backups. For more information on incremental backups, see Performing an incremental backup, on page 86.

Copying an HPE VM Explorer StoreOnce Catalyst backup

HPE StoreOnce Catalyst is provided with an advanced copy backup capability (Catalyst copy) that optimizes the transfer of deduplicated data. The copy backup process is performed asynchronously in a bandwidth efficient way, ensuring that only unique data is transmitted between StoreOnce devices. You can also copy backups from other storage to an HPE StoreOnce Catalyst storage target and vice versa.

To copy an HPE StoreOnce Catalyst backup, follow the normal HPE VM Explorer backup copy procedures. For more information on how to copy a backup in HPE VM Explorer, see Copy a backup, on page 90. For more information on the capabilities of copying a backup between HPE StoreOnce Catalyst targets, see the HPE StoreOnce Catalyst documentation.

> **NOTE:** HPE StoreOnce Catalyst does not support copying encrypted or compressed backups.

Restoring an HPE StoreOnce Catalyst backup

To restore an HPE StoreOnce Catalyst backup:

1. Go to the **Datacenter** view and, in the **Welcome to HPE VM Explorer** screen, click **Restore a Virtual Machine**, or go to *Management > Backup Explorer*.

2. In the **Backup Explorer** screen, expand the desired Virtual Machine name to view the backups performed so far and wait for the backup entries to HPE StoreOnce Catalyst to be refreshed. For more information, see Viewing HPE StoreOnce Catalyst backup status details, below. Then, right-click the backup entry you want to restore and select **Restore** on the shortcut menu.

3. In the **Virtual Machine Restore** screen, configure the desired VM restore details. For more information, see Restoring a VM Backup, on page 98.

> **NOTE:** You can only restore successful (consistent) backups. Also, performing a file level restore or an Instant VM Recovery is not currently supported from HPE StoreOnce Catalyst backups.

Viewing HPE StoreOnce Catalyst backup status details

To view the status and history of the backups to HPE StoreOnce Catalyst, go to *Management > Backup Explorer*. In the **Backup Explorer** view, expand the desired Virtual Machine and click the desired backup entry to view its details. Successful backup entries are marked with a ✅ green check icon, while failed backup entries due to inconsistent files are marked with an ❌ "X" red icon.

> **NOTE:** You can only perform the operations available on the right-click menu (restore, remove from inventory and remove from disk, refresh information and view the details) after the status of the entry has been displayed.

Modifying HPE StoreOnce Catalyst storage settings

To modify HPE StoreOnce Catalyst storage settings, go to **Storage Systems > Deduplicating Storage**, click the desired storage target in the tree and then, in the ***<storage target name>*** screen, click **Edit** and perform the desired changes. For more information, see Adding an HPE StoreOnce Catalyst storage target, on page 63.

HPE StoreOnce Catalyst storage settings

> **NOTE:** You can only modify an HPE StoreOnce Catalyst storage target, not the stores.

Modifying an HPE StoreOnce Catalyst store

HPE VM Explorer allows you to modify HPE StoreOnce Catalyst storage targets, not stores. You can only modify stores from the HPE StoreOnce User Interface. For more information, see the HPE StoreOnce documentation.

Deleting an HPE StoreOnce Catalyst storage target

To delete an HPE StoreOnce Catalyst storage target, click the desired deduplicating storage target in the **Deduplicating Storage** tree and then, in the **<storage target name>** screen, click **Remove**. In the confirmation message, click **OK**.

Deleting an HPE StoreOnce Catalyst store

In HPE VM Explorer you can only delete HPE StoreOnce Catalyst storage targets, not stores. You can only delete a store from HPE StoreOnce User Interface. For more information, see the HPE StoreOnce documentation.

Viewing HPE StoreOnce Catalyst storage target or store information

To view an HPE StoreOnce Catalyst storage target or store information, go to the **Deduplicating Storage** view and click the desired storage target or store. The information is displayed in the ***<storage target name>*** screen or ***<store name>*** screen.

HPE StoreOnce Catalyst storage target information screen
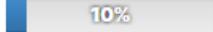
HPE StoreOnce Catalyst store information screen

Viewing HPE StoreOnce Catalyst backup entry details

To view HPE StoreOnce Catalyst backup entry details:

1. Go to **Management > Backup Explorer** and expand the desired Virtual Machine name backed up on HPE StoreOnce Catalyst.

2. Click the desired backup entry to view its details. For more information, see Viewing HPE StoreOnce Catalyst backup status details, on page 67. Then, right-click the updated backup entry and, on the shortcut menu, point to **Details**. The backup entry information is displayed in the **Backup Details** screen.

Rebuilding the list of HPE StoreOnce Catalyst backups

In the event you moved and re-added an HPE StoreOnce Catalyst device, or connected it to a fresh install f HPE VM Explorer, you can refresh and get the updated list of existing backups on the HPE StoreOnce Catalyst storage. To do so, go to ***Storage Systems > Deduplicating Storage***, click the desired storage target or store and then click **Catalog** in the HPE StoreOnce Catalyst ***<storage target name>*** or ***<store name>*** screen. The system will then retrieve the entire list of existing HPE VM Explorer backups stored on the device. Depending on your infrastructure and number of backups, this operation may take some time.

HPE StoreOnce Catalyst file level restore

You can restore a single or multiple files of your choice stored on HPE StoreOnce Catalyst using the same procedure as for other storage targets.

File Explorer enables you to browse a disk image file and recover individual files. Just select a disk image file and click, wait for the information to refresh to be able to navigate its content and view all its files and directories. To recover a single file or a whole directory, right-click the file and select **Download**, then choose the destination.

HPE VM Explorer supports the following file systems on disk image files for file level recoveries:

- NTFS
- FAT
- Windows Dynamic Disks (simple, spanned, striped, mirrored volumes)
- Linux—EXT (2 and 3, and EXT 4 is supported for both 32 and 64 bits versions)
- Linux LVM—Logical Volume Manager (linear, striped, mirrored volumes)
- Linux—XFS

If the EXT partition in the selected image disk is not 100% consistent, you will be notified in this respect, however, you can continue navigating the image disk. To generate consistent disk images, we recommend that you enable the quiesce option for the backups.

Disk image warning

You can recover single or multiple files either from the **File Explorer** or from **Backup Explorer**.

To recover one or multiple files from **File Explorer**:

1. Go to **Management > File Explorer** and navigate to the backup entry from which you want to recover one or more files.

2. Select which file(s) you want to restore, either by choosing an individual file or multiple files while holding the **Ctrl** key pressed. Then, right-click and point to **Download** on the shortcut menu to download the file(s) as a ZIP archive using the regular browser download procedure.

To recover one or multiple files from **Backup Explorer**:

1. Go to *Management > Backup Explorer*, expand the desired backup entry and wait for the information to refresh. After refresh, successful backup entries are marked with a ✅ green check icon, while failed backup entries due to inconsistent files are marked with an "X" 🗙 red icon.

2. Right-click the valid backup entry you want to restore and point to **Locate Files...** on the shortcut menu. The various files on the VM are displayed.

3. Select which file(s) you want to restore, either by choosing an individual file or multiple files while holding the **Ctrl** key pressed. Then, right-click and point to **Download** on the shortcut menu to download the file(s) as a ZIP archive using the regular browser download procedure.

> **NOTE:** Depending on the number and size of the files inside a folder that you want to restore, the operation can take some time.

HPE StoreOnce Catalyst granular recovery from Microsoft Exchange Server

With the Exchange Server granular recovery for e-mail message(s), HPE VM Explorer enables you to recover e-mails (with or without attachments) from a VM backup that contains a valid Microsoft Exchange Server installation. The procedure for performing a Microsoft Exchange Server e-mail granular recovery from an HPE StoreOnce Catalyst backup is identical to other storage targets.

This feature currently applies to the Enterprise Edition of HPE VM Explorer.

> **NOTE:** HPE VM Explorer supports Microsoft Exchange Server versions 2013 and 2016.

To recover an Exchange Server item:

1. Go to *Management > Backup Explorer* and then navigate to the VM of your choice by expanding the list of available backups.

2. Right-click the VM that you want to recover the Exchange Server item from and point to **Recover Exchange Server Items...** on the shortcut menu. The **Exchange Server Items Recovery** wizard is displayed.

3. In the **Exchange Server Location** wizard screen, select the location of the Exchange Server installation. You can either:
    a. Let HPE VM Explorer scan the available disks automatically, or

    b. Select a location manually by clicking the **Please Select** button and choosing the desired folder in the **Choose Directory** dialog box.

    > **NOTE:** Make sure you have enough disk space on your computer to accommodate the entire Exchange Server database you are retrieving. You can configure the Exchange Recovery data path in the **Settings** section of HPE VM Explorer. For more information, see Configuring General settings, on page 117.

    When finished, click **OK** to return to the **Exchange Server Items Recovery** wizard and then click **Next**.

Exchange Server Recovery wizard – select location

4. In the **Database Selection** wizard screen, you can see the database detected by HPE VM Explorer as well as its recovery status:

- **Not Ready**—Before the extraction of the temporary recovery data from the backup.

- **Ready**—When extraction is successful.

You can delete the temporary recovery data on the local machine by clicking the **Close** button. If you want to manually select another Exchange Server database, click **Add Exchange database** and then choose the desired one in the **Select File...** dialog box. When finished, click **OK** to return to the **Database Selection** wizard screen and click **Next**.

Exchange Server Recovery wizard – Select database

5. In the **Database Preparation** wizard screen, you can see the process of extracting and consolidating the Exchange database for recovery. The temporary recovery data is automatically saved in the location configured in the **Settings>General** section. For more information, see Configuring General settings, on page 1. If the operation is not successful, click **Refresh** to verify your Exchange Server settings and then go back in the **Exchange Server Items Recovery** wizard to make the necessary changes. If the operation is successful, click **Next**.

Exchange Server Recovery wizard – Prepare database

6. In the **Exchange Item Selection** wizard screen, you can see the mailboxes of all the users in the selected Exchange Server database.

   a. If you want to restore individual e-mails, expand the user name(s), navigate to the desired mailbox folder and select the e-mail you want to recover.

   b. If you want to restore all the e-mails associated to certain users, select the checkboxes next to the user names.

   You can select/clear all the users whose e-mail mailboxes you want to recover by clicking the respective buttons. Also, you can collapse all expanded user accounts by clicking **Collapse All**. You can recover any types of e-mails irrespective of their folder or whether or not they have one or multiple attachments. When finished, click **Start Recovery**.

Exchange Server Recovery wizard – Select Exchange Server items

7. When the process is complete, you can download the recovered item(s) as a *.ZIP* file. In order to copy back one or more e-mails to production, simply drag-and-drop them into your Microsoft Outlook mailbox. Then, you can continue the recovery process by clicking **Yes** in the confirmation message or you can click **No** to exit the **Exchange Server Items Recovery** wizard.

> **NOTE:** Make sure your browser allows pop-ups from HPE VM Explorer.

HPE StoreOnce Catalyst Instant VM Recovery

With HPE VM Explorer, you can power on a backup directly on an ESX/ESXi server from an HPE StoreOnce Catalyst storage using the Instant VM Recovery feature, without the need of restoring or copying any file.

> **NOTE:** The instant VM recovery of a Microsoft Exchange Server may take a bit longer depending on whether the server is configured as a domain controller

To do so:

1. Go to *Management > Backup Explorer*, filter through the available backups, if needed, then expand the backups' tree to get to the desired VM. Then, right-click the VM and select **Instant VM Recovery**. An NFS server will mount a temporary datastore on your host. The actual disk is preserved on your local disk.
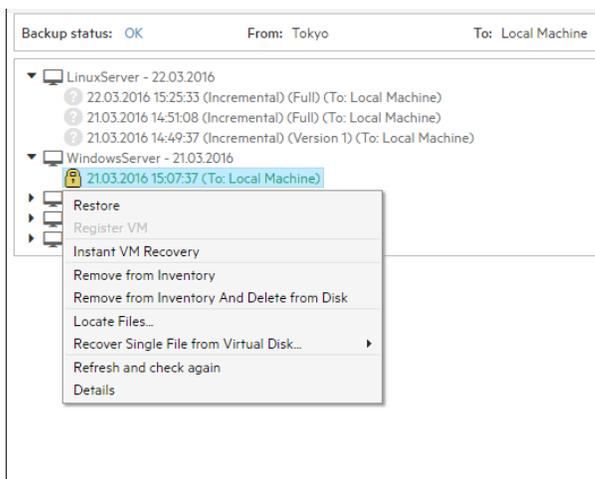
Instant VM Recovery from the Backup Explorer

2. In the **Instant VM Recovery** dialog box, register the VM to your selected server.
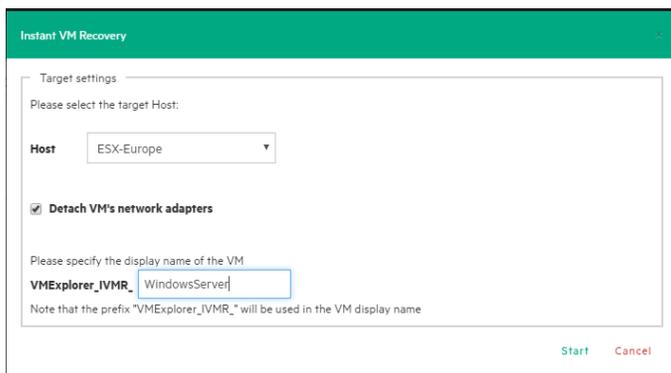
Instant VM Recovery target settings

3. When finished, click **Start**.

> **NOTE:** You can perform any test during your Instant Recovery process, as none of your changes will be saved. You can also remove any network adapters to avoid conflicts with the original VM (default option). While the Instant VM is up and running, you can even perform a vMotion operation to migrate it to an existing datastore, making it a real VM, not dependent on the HPE VM Explorer Instant VM Recovery System.

Removing an HPE StoreOnce Catalyst backup

You can either remove an HPE StoreOnce Catalyst backup from the HPE VM Explorer inventory or you can remove the backup from the HPE VM Explorer inventory and delete it from the HPE StoreOnce Catalyst storage target. To do so:

1. Go to *Management > Backup Explorer*, expand the desired Virtual Machine name backed up on HPE StoreOnce Catalyst and click the desired backup entry to update its details. For more information, see Viewing HPE StoreOnce Catalyst backup status details, on page 67.

2. Then, right-click the backup entry and, on the shortcut menu, depending on your preferences, point to either option:

    a. **Remove from Inventory**—If you want to remove the backup from the **Backup Explorer** view

    b. **Remove from Inventory and Delete from Disk**—If you want to remove the backup from the **Backup Explorer** view and the storage environment completely

3. In the confirmation message, click **OK**.

Best practices when working with HPE StoreOnce Catalyst

There are some things that you need to take into consideration in order to enjoy the best performance from the HPE VM Explorer integration with HPE StoreOnce Catalyst. For example, the following features do not currently apply to backups to HPE StoreOnce Catalyst stores:

- Encrypted backups
- File consistency check
- Compressed backups
- Federated disks

You can also configure the log processes for support purposes. For more information, see Getting Support for HPE VM Explorer, on page 140.

Backing Up One or Multiple Virtual Machines

With HPE VM Explorer you can back up one or multiple Virtual Machines.
To perform a backup in HPE VM Explorer:

1. Go to the **Datacenter** view and expand your ESXi or Hyper-V host to get a list of all your Virtual Machines. If you are using vCenter, then expand your vCenter hosts to see all Virtual Machines.

2. Right-click the Virtual Machine you want to back up and click **Backup…** and then, in the **Virtual Machine Backup** dialog box, configure the boxes, as required.

You can also create a task to back up one of your VMs from the **Scheduled Tasks** view. To do so:

1. Go to *Tasks > Scheduled Tasks* and select a scheduled task in which to create the backup task.

2. Click **Add** and then, in the **Add Task Element** screen, click **Single VM** (for more information, see Backing up a single VM, on the next page) or **Multi VM** (for more information, see Backing up multiple VMs, on page 84).
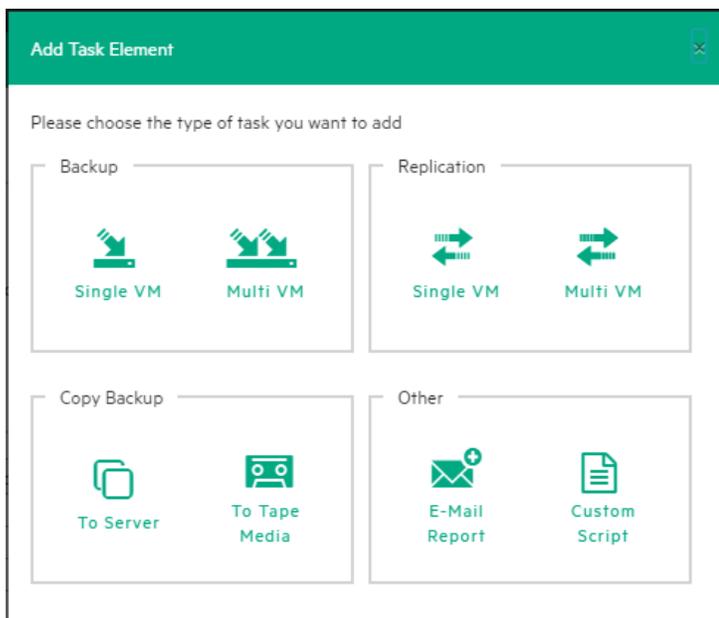
Add Task element

Backing up a single VM

To back up a single VM, click **Single VM** in the **Add Task Element** screen. For more information, see Backing Up One or Multiple Virtual Machines, on the previous page. Then, in the **Virtual Machine Backup** dialog box, configure the boxes in the specific tabs, as follows. Depending on the nature of the VM, some of the options available to you at this stage may vary.

1. In the **General** tab, under **Target**, select a target location from the **Host** list. This can be your local PC, an ESXi host, a Hyper-V host, Linux/FreeBSD or Cloud host already added to your **Datacenter** view. Choose the target directory and configure the backup process. When finished, click **OK** to start the backup process.
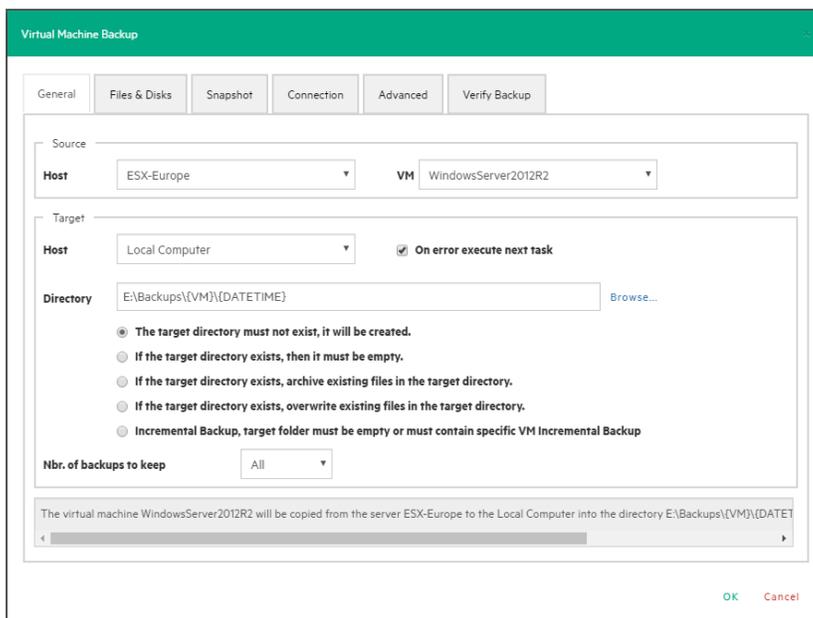
Backup - General

HPE VM Explorer will create a snapshot of your Virtual Machine, which means you can back up a running Virtual Machine without stopping it. When the backup is finished, HPE VM Explorer automatically deletes the Snapshot on your ESXi or Hyper-V server.

> **NOTE:** Selecting the **If the target directory exists, overwrite existing files in the target directory** checkbox will only overwrite the existing backup after the new backup has been successful. The reason for this is to always keep a working backup, so make sure you have enough free space while running the backup. You can also delete the existing backup before starting the new backup by selecting the **Delete existing Backup in the target directory before the Backup starts** checkbox.

> **IMPORTANT:** Selecting this checkbox means that, if the backup fails, you will no longer have a functional backup.

At this stage, you can also perform an incremental backup. For more information, see Performing an incremental backup, on page 86.

2. In the **Files & Disks** tab, choose which Virtual Disks you want to include in the backup. If the option **Include memory dump of the virtual machine** is enabled in the **Snapshot** tab, you must select all virtual disks, otherwise you will not be able to restore the memory snapshot. Select the **After backup convert as thin disk** checkbox to convert all disks in the backup to thin format. This option is only available if:

   a. The target host is ESXi

   b. The HPE VM Explorer Agent is enabled on the target server (only for ESXi).

   c. The **Keep data compressed at destination** option is not enabled.

   d. There are no other disks with the same name.
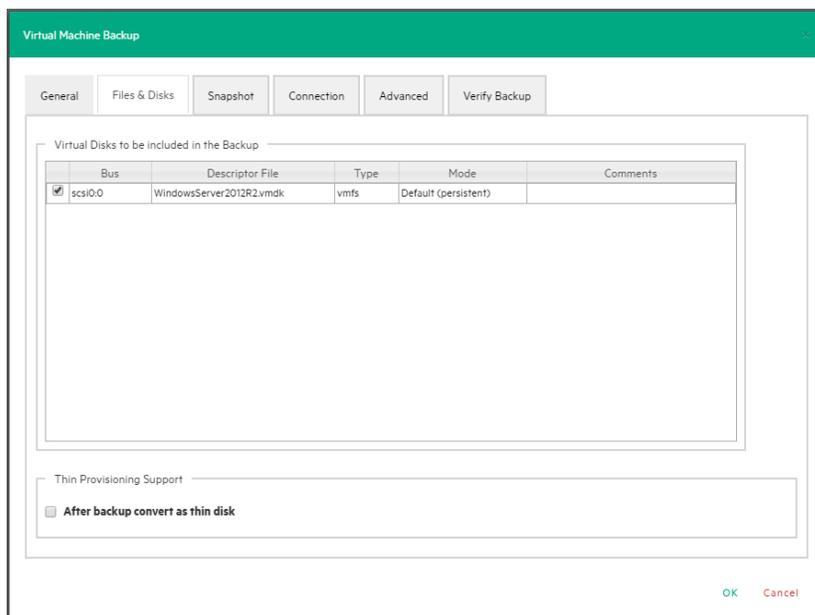
Backup - Files & Disks

3. In the **Snapshot** tab (ESXi only), configure your VM backup snapshot options. All recommended options are already selected by default.

   - **Include memory dump of the virtual machine (needs additional snapshot)**–If your VM is running, HPE VM Explorer creates a memory snapshot of the VM. When restarting the VM, you will lose the current memory. If you also want to back up the memory to capture the exact running state, select this checkbox.

   - **Quiesce the file system in the virtual machine (only when VMware tools are installed)**– Select this checkbox (recommended) if VMware tools are installed on the guest system so that VMware tools can inform the OS that a snapshot will be created. This enables you it to write down all necessary data for a consistent snapshot.

   - **Make storage snapshot**–Select this checkbox if all datastores used by the VM are located on SAN Infrastructures. This will enable the backup to take storage snapshots of each datastore, mount them on the same server where the VM is registered and then start the normal backup process on this copy of the VM structure. Then, HPE VM Explorer unmounts and then un-maps all the datastores and finally removes all the snapshots previously created. This type of backup allows the host to release the source VM immediately after the storage snapshots are created, thus drastically reducing the merge times of a normal backup.
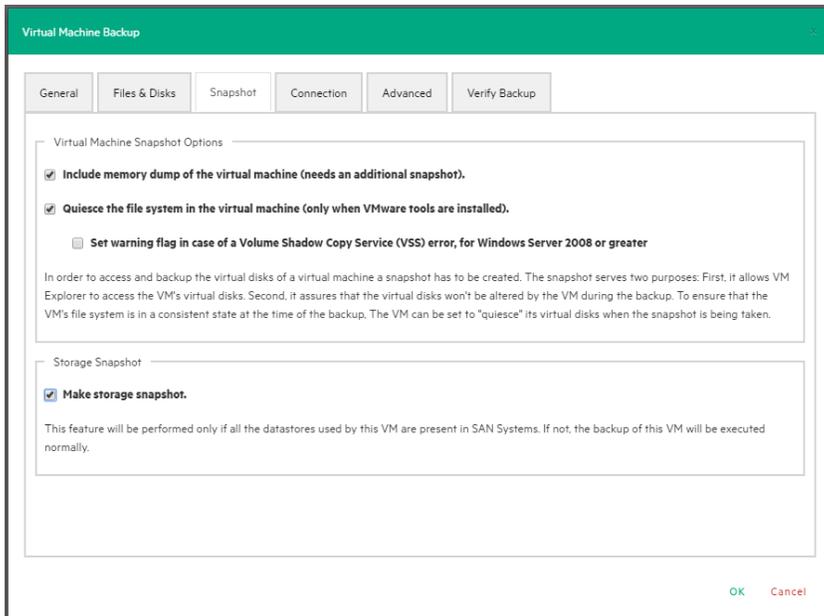
Backup – Snapshot (ESXi)

4. In the **VSS Snapshot tab** (Hyper-V only), configure your VSS options, which ensures the consistency of the backup. Not using the VSS may grant you a faster performance but does not guarantee backup data consistency.
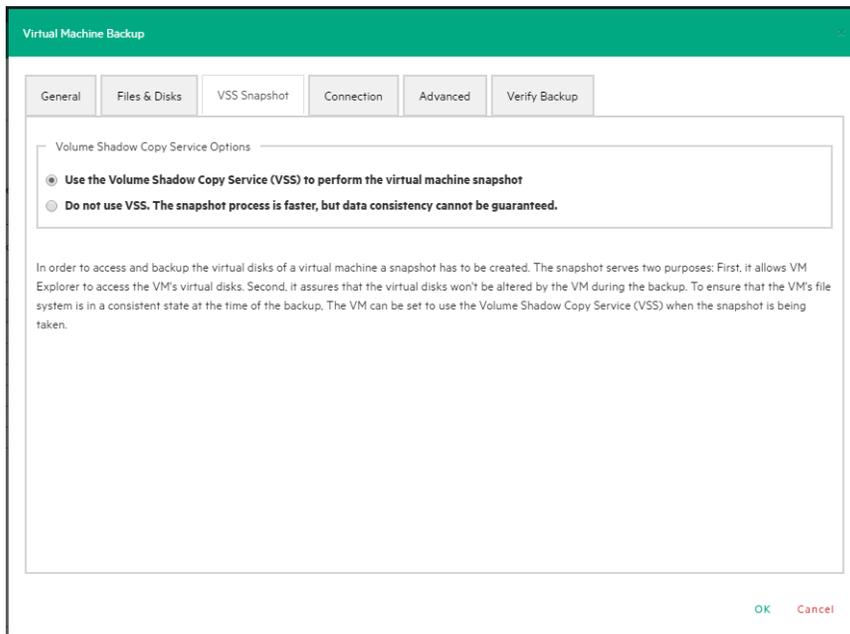
Backup - VSS Snapshot (Hyper-V)

5. In the **Connection** tab, configure the single VM backup connectivity options.

   a. **Direct Copy Options**–Select if you want to transfer files directly between the source and the target server. You can also reverse the direction of the TCP connection (default is from the source server to the target server) in case of NAT (Network Address Translation). The direct

copy options are not available if the source or target server is ESXi and the HPE VM Explorer Agent is not enabled.

b. **Compress data during transfer**–Select to compress data during transfer. You can also decide to keep the data compressed at destination but in this case the File Level Restore will not be available for this backup.

c. **Encryption**–You can also use encryption in conjunction with the Cloud servers (Amazon S3, OpenStack and so on). The direct copy connection is unavailable and all the data will be relayed through HPE VM Explorer (for more details, see).

> **CAUTION:** The password is stored encrypted and is not retrievable. Make sure to save it in a safe place to be able to decrypt the backup.
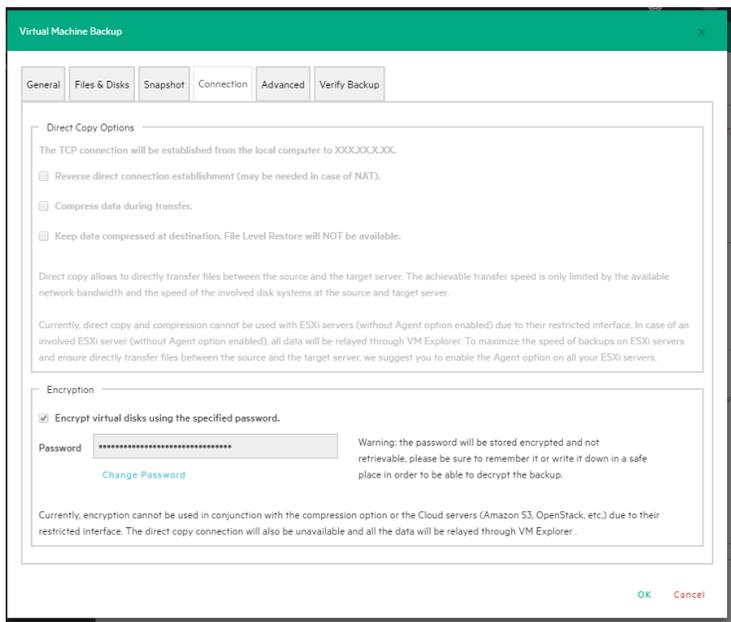
Backup - Connection

6. In the **Advanced** tab, you can either shut down or unsuspend the guest VM before starting the backup if VMware Tools or Hyper-V Integration Services are installed on the guest VM.

- If you choose to shut the guest VM down, you can also configure if and when to restart it (once the backup starts, once the backup is terminated or never to restart the guest VM) and the shutdown timeout error interval.

- If the guest VM (source) is suspended, you can set the next suspended state (once the backup starts, once the backup is terminated or not to suspend the guest VM again), as well as the suspend timeout error interval.
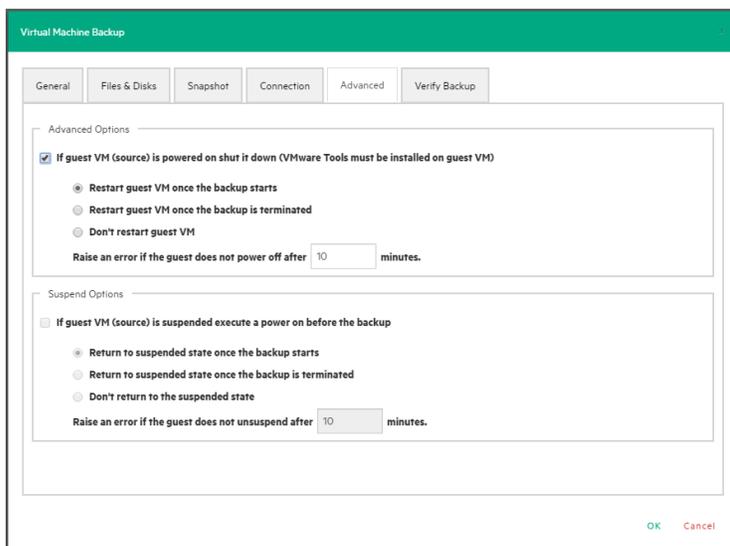
Backup - Advanced

7. In the **Verify Backup** tab you can configure when to run the File System Consistency check after the backup is completed and whether or not to test the backup using the HPE VM Explorer Instant Backup Test system.
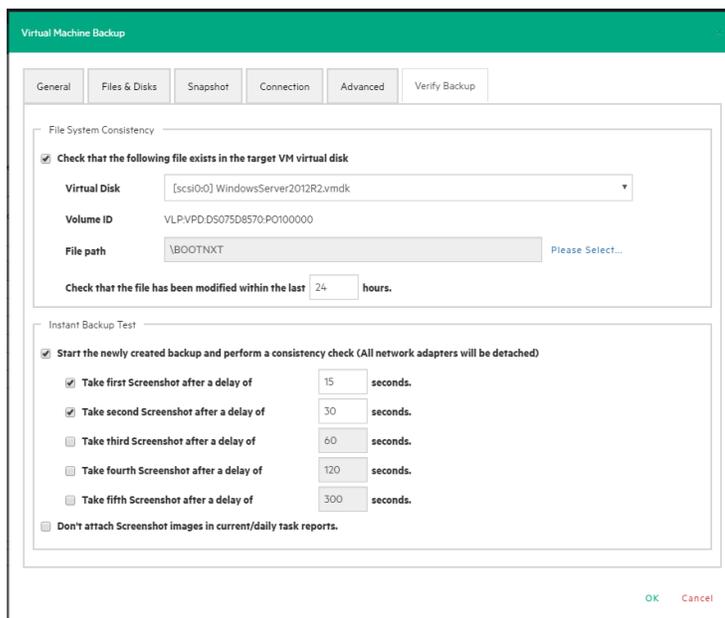
Backup - Verify Backup

- **Perform a File System Consistency check**—Enables you to check for changes and last modification date of a specific file in a target virtual disk, once the backup/replication operation is completed. You can select the target virtual disk and the file path to check and specify the acceptable modification time interval (for example, if the file has changed within the last 24 hours). The File System Consistency check is performed once the backup/replication operation is completed: HPE VM Explorer will open the fresh target virtual disk and look for the specified file path, checking for its existence and last modification date. If the check fails, the resulting backup/replication status will be set to Warning and a detailed message will be included in the

report.
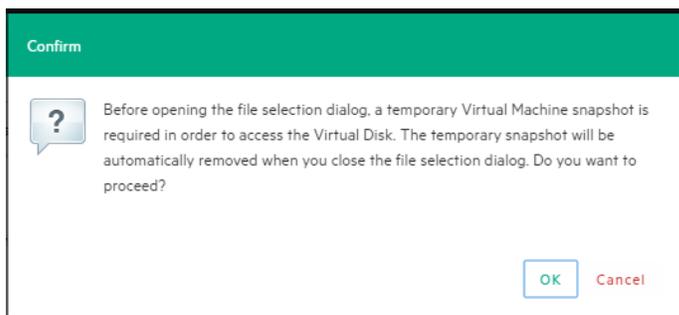
Backup - File Consistency confirmation message

> **NOTE:** During the File System Consistency configuration, in order to access and browse the virtual disk, a temporary VM snapshot will be required, which will be deleted automatically once the file selection dialog box closes. To accept and proceed, click OK in the Confirm dialog box.

- **Instant Backup Test**–Enabling this option adds a completed backup to the Hypervisor inventory as a powered on VM. The VM health state is checked and you can take screenshots of the VM Console every x seconds. You can check the health state and VM screenshots in the Task History or in the e-mail report. For more information, see Viewing Task History, on page 116 or Sending E-mail Reports, on page 111.

  To use this option, configure the HPE VM Explorer NFS Settings. For more information, see Working with HPE VM Explorer Settings, on page 117.

> **NOTE:** Screenshots taken during backup test are visible in the **Task History** view or in **E-mail reports**. Automated backup test, for the moment, is only available for VM running on ESXi and if the target is set to <local computer>. During the backup test all network adapters will be disconnected so that the test will not compromise your network. Any change occurred during the Instant Backup Test will be discharged when the test is over and will have no influence on the backup data (backup data, during the test, is read-only). HPE VM Explorer cannot perform the backup of the ESXi and Hyper-V host configuration.

Backing up multiple VMs

To back up two or more VMs, in the **Add Task Element** screen, under **Backup**, click **Multi VMs**. For more information on how to get to this screen, see Backing Up One or Multiple Virtual Machines, on page 77. Then, in the **Virtual Machine Backup** dialog box, configure the boxes in the specific tabs, as described in Backing up a single VM, on page 78. Note that, depending on the backup target of your choice, the User Interface available to you at this stage may vary.
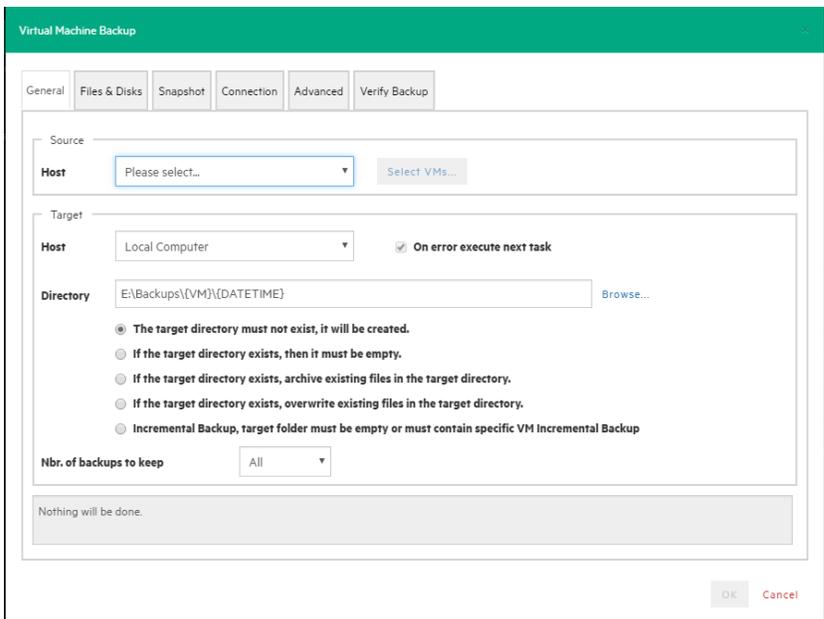
Multiple VM backup - General

The difference with the single VM backup is that you can select more than one VM by clicking Select VMs… and then selecting the desired VMs to back up. You can change the machines' backup priority using the Up and Down buttons. In the backup dialog box, the directory field must contain the {VM} tag.

> **NOTE:** The {VM} tag is not used in the case of an HPE StoreOnce Catalyst backup.
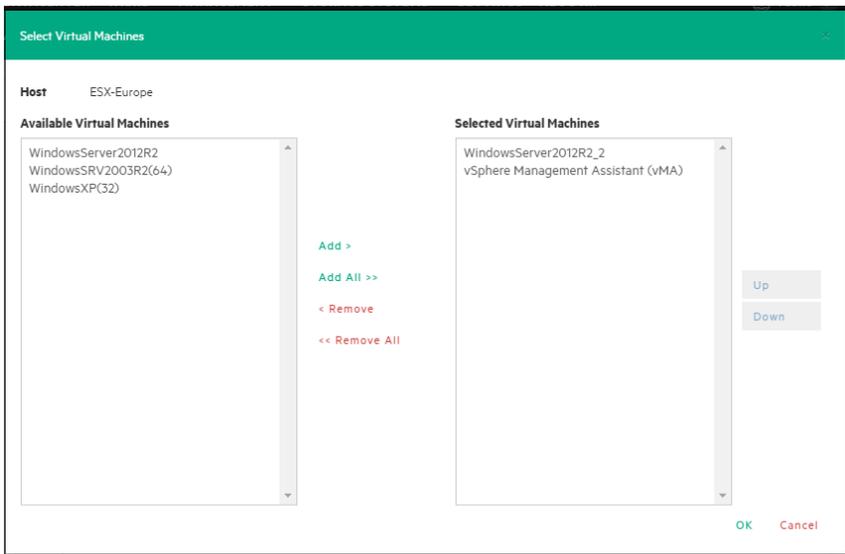
Multiple VM backup - Select multiple VMs

Also, since the settings are shared across every VM included in the task, you cannot select the files and disks to back up for every single VM in the **Files & Disks** tab: everything in the Virtual Machines will be backed up.

Performing an incremental backup

With HPE VM Explorer you can create incremental backups, which transfer only the modified files to the next backup, not the entire Virtual Machine. Note that you cannot perform an incremental backup of VM snapshot points, but during the restore process you can choose which backup version (backup date) you want to restore. For more information, see Restoring an incremental backup, on page 101.

There are no restrictions for running Incremental Backup on Hyper-V, but you need to take into account certain aspects when performing an Incremental Backup on ESXi servers.

Prerequisites for incremental backup

- For **ESX/ESXi (licensed edition)**, you need Virtual Disk Development Kit (VDDK) installed on your computer and your system needs to meet the following requirements:
  - ESXi 5.5/6.0/6.5 or ESXi 6.0 Free Edition

    > **NOTE:** The free edition of ESXi 5.5 is not supported.

  - Virtual Hardware of your VM must be version 7 or higher (check your version in your vSphere Client in the settings editing section of your VM).

  - You must enable VD service support for the Server in HPE VM Explorer.

  - You must initialize the VD service.

    To enable VD Service backup, you must edit your server settings (**Expert Settings** tab) in the HPE VM Explorer Server view. For more information, see Working with Servers in HPE VM Explorer, on page 23.

- For **ESXi free edition**, you do not need VDDK, but you must enable the HPE VM Explorer agent on the ESXi server by selecting the **Try to use the HPE VM Explorer agent on ESXi (…)** checkbox in the **SSH / HPE VM Explorer Agent** screen of the **Add or Edit Server (ESXi)** wizard. For more information, see Working with Servers in HPE VM Explorer, on page 23.

  After configuring all the settings, in the **Virtual Machine Backup** dialog box, select **Incremental Backup, target folder must be empty or must contain Specific VM Incremental Backup**. All other procedures are the same as for the default backup. HPE VM Explorer initially creates a full backup of your VM and then will create incremental backups, which contain only the changed data.
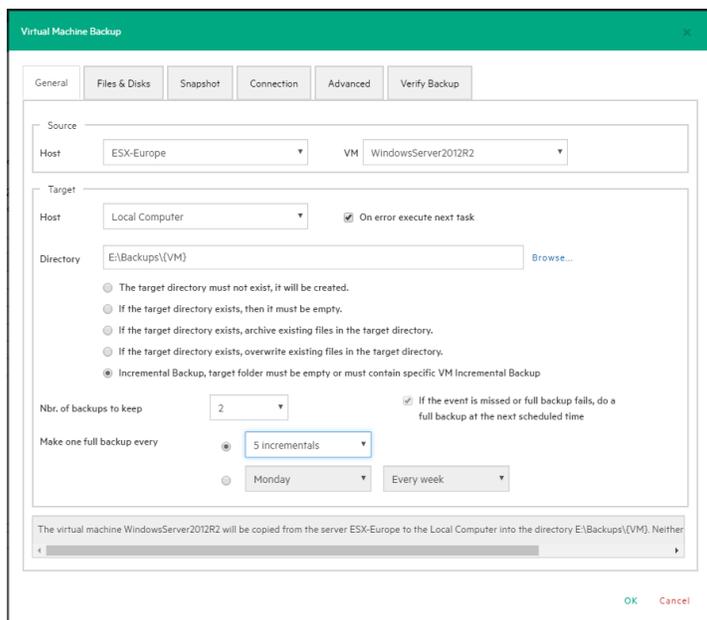
Incremental Backup - General

Enabling VD Services for incremental backups

To enable Incremental Backups on ESXi, you need ESXi 5.5 or later. Next, you must make sure, that you upgraded the virtual hardware in your Virtual Machine to Version 7 or later.

In addition, HPE VM Explorer needs to be initialized to use the Virtual Disk Service Library (VD Service) and you must enable the VD Service in HPE VM Explorer for each host.

Enabling VD Service for each ESXi host

You can configure the VD Service settings when adding an ESXi host (for more information, see Adding an ESXi server, on page 26). After initializing the VDDK library, which is mandatory for the VD Service to work, you need to enable the VD service for every ESXi host you are adding or to modify each previously added ESXi host. For more information on initializing VD Service, see Initializing Virtual Disk Service (VD Service), on page 25. For more information on modifying servers, see Modifying a server, on page 37.

To enable the VD Service:

1. Go to the **Datacenter** view and right-click the ESXi host you want to configure. In the shortcut menu, point to **Edit Server…**

2. In the **Edit Server** wizard, go to the **Advanced Settings** screen and select **Use VD Service**. Click **Next**.
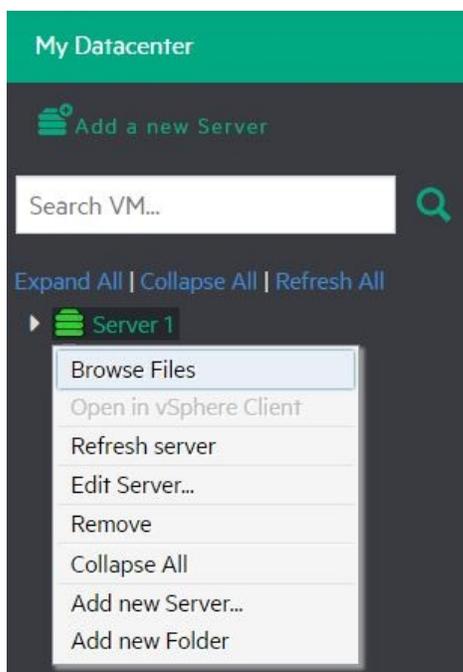
Edit server

3. In the **Test Connection** screen, verify your settings. When finished, click **Finish**. Repeat this procedure for all other ESXi hosts.

Backup encryption

With HPE VM Explorer, you can encrypt the backups to increase the security of your Virtual Machines using AES algorithm, a standard sector-based data encryption method defined by IEEE P1619. Specifically, only the disks' data will be encrypted using the specified password.

You can use encryption only with Cloud storage targets; other environments, such as HPE StoreOnce Catalyst, do not support encryption. The direct copy connection is unavailable and all the data is relayed through HPE VM Explorer.

To encrypt your backups, during the backup configuration process (for more information, see Backing Up One or Multiple Virtual Machines, on page 77), in the **Connection** tab, select **Encrypt virtual disks using the specified password** and then type your password.
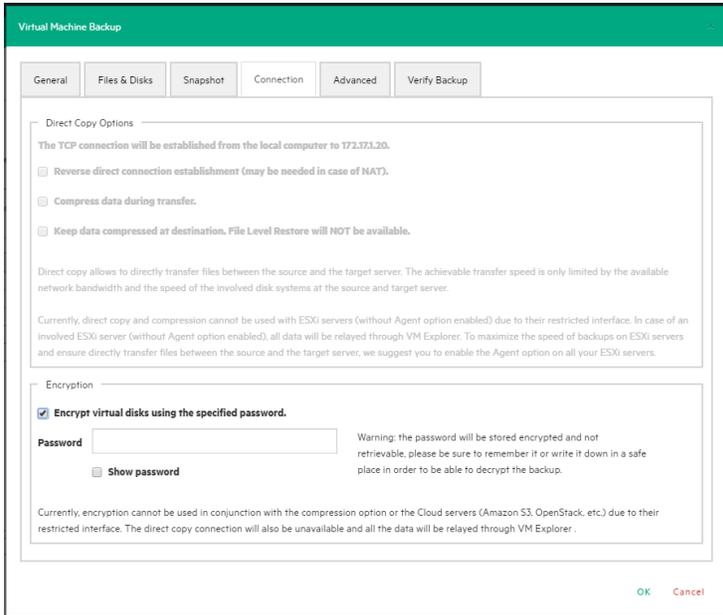
Backup encryption

> **CAUTION:** The password is stored encrypted and is not retrievable, so make sure to remember
> it or write it down in a safe place in order to be able to decrypt the backup.
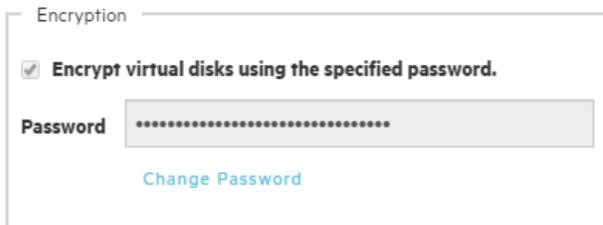
Password encryption
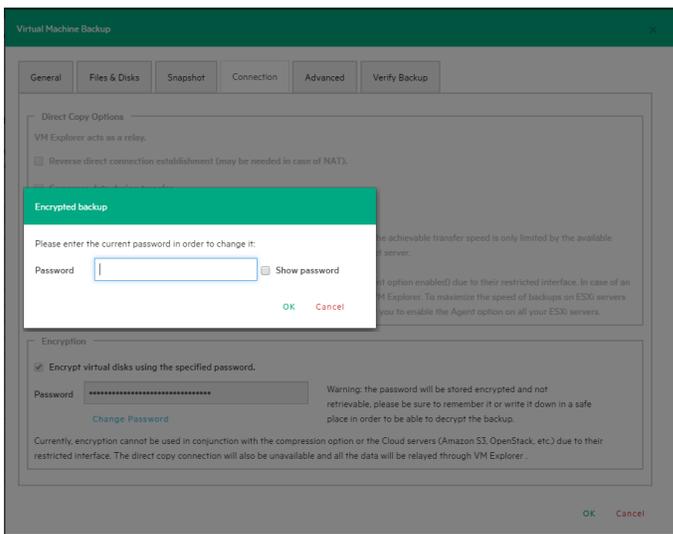
Change encryption password

Copy a backup

You can schedule a copy of one or more existing backups to another target destination. To do so:

1. Go to *Tasks > Scheduled Tasks* and click **Add**.

2. In the **Add Task Element** screen, under **Copy Backup**, select the desired backup destination: to server or to tape media.

3. In the **Add Copy Backup Task** wizard, in the **Backups to copy** screen, select the backup element(s) you want to copy from the list. Here, you can select an entire scheduled task (all included backup elements will be copied) or individual backup/multiple VMs backup elements. The scheduled Copy Backup Task is performed individually for every VM only on backup versions that have changed since the last backup (if not, no backup is performed of these machines).
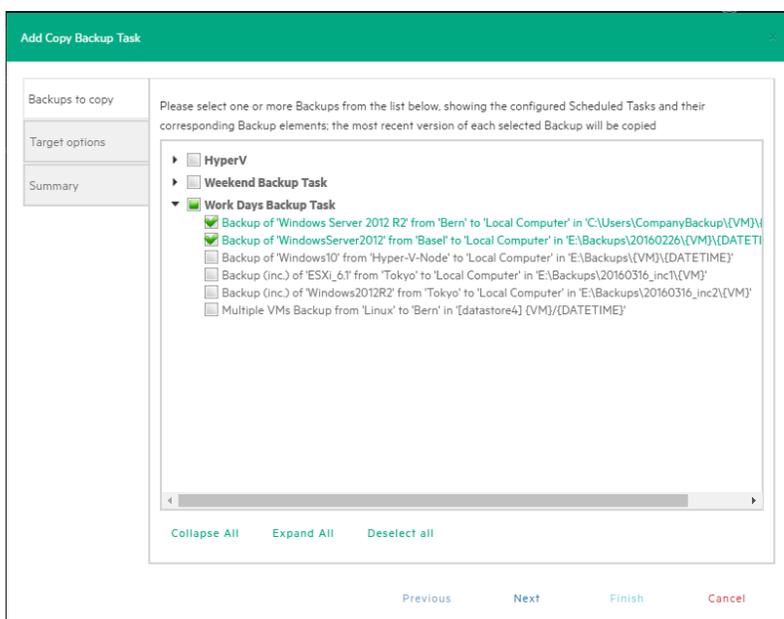
Copy Backup - Backups to copy

4. a. **Copy Backup to Server**—In the **Target options** screen, select the target host and the path for the backup copies. The destination path of the target server consists of the specified target base path followed by the selected append path option. You can group the backup copies by VM name or by date/time of copy and vice versa.

   The {VM} and {DATETIME} placeholders of the append path stand for:

   - {VM}: the display name of the backed up VM.

   - {DATETIME}: the starting date/time of the scheduled task in which the copy task is included, in **YYYY-MM-DD-hhmmss** format

   Also, specify the number of full backup copies to store on the target server: either **All** (default), which copies all backup copies, or a specific number, which deletes all older copies.

   > **Important!** You can copy incremental backups to either HPE StoreOnce Catalyst or to your local computer. To keep the incremental folder structure consistent on your

computer, only the {VM} subfolder will be appended to the target base path, ignoring the current date/time and keeping the original backup date/time folder structure.

Copy Backup - Target options (to Server)

b. **Copy Backup to Tape Media**—In the **Target options** screen, select the desired target tape media pool. You can select the target tape library, then a corresponding target custom media pool you created. When choosing a media pool, you will copy the backups onto a media included in it, using the media pool's retention rules. All available space will be used to store backup data. Large backups will be automatically split into multiple tape media if necessary. Also, you can enable hardware data compression if your tape device supports it.

Copy Backup - Target options (Tape Media)

5. In the **Summary** screen, you can see the details of your copy backup options. At this stage you can go back and make any necessary changes. When finished, click **Save**.
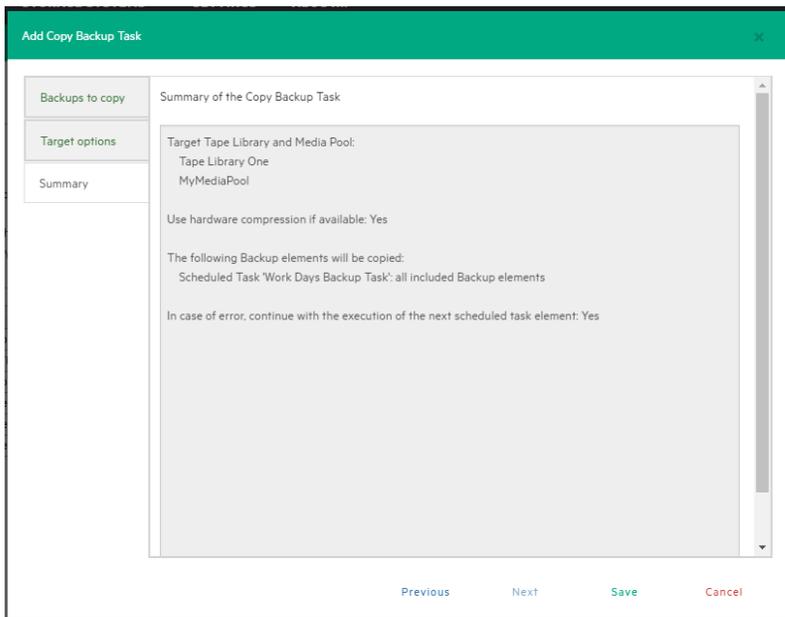
Copy backup - Summary

> **NOTE:** Removing or modifying any scheduled tasks or backup elements referenced by the copy backup task (removing a backup element that was supposed to be copied) might result in failed subtasks. You can fix this by keeping the copy backup task up to date, editing it and deselecting the highlighted items with errors.
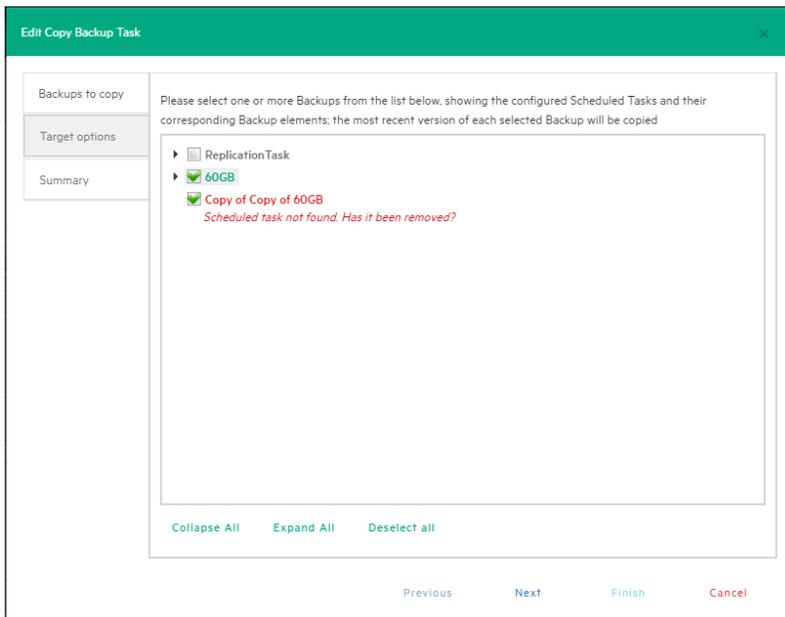
Copy Backup - Target options (removed Scheduled Task)

Replicating One or More Virtual Machines

With HPE VM Explorer, you can replicate one or multiple Virtual Machines (VMs) to another hypervisor host. To do so:

1. Go to *Tasks > Scheduled Tasks* and click **Add**.
2. In the **Add Task Element** screen, under **Replication**, select either **Single VM** or **Multi VM**, depending on your preferences.
3. In the **Virtual Machine Replication** dialog box, configure the replication parameters. For more information, see Replicating a single Virtual Machine, below and Replicating multiple Virtual Machines, on page 97.

> **NOTE:** Some storage environments, such as HPE StoreOnce Catalyst, may not support replication.

Replicating a single Virtual Machine

Here is the compatibility matrix of supported hypervisors you can use to replicate a previous **incremental backup** of a Virtual Machine (VM):

Hypervisors	ESXi free target	ESXi licensed target
ESXi free source	√	√
ESXi licensed source		√

Hypervisors	Hyper-V 2008 R2/2012/2012 R2	Hyper-V 2016 with Microsoft CBT	Hyper-V 2016 with HPE VM Explorer Agent
Hyper-V 2008 R2/2012/2012 R2	√	√	√
Hyper-V 2016 with Microsoft CBT		√	√
Hyper-V 2016 with HPE VM Explorer Agent	√	√	√

> **NOTE:** If this is your first incremental replication, follow the on-screen instructions.

To replicate a single VM, configure the **Virtual Machine Replication** dialog box, as follows:

1. Click **Single VM** and then, in the **General** tab, select the **Source Host** and the VM that you want to replicate and the target location – the same host as the VM or another host in the **Datacenter** view. Choose the target directory, the name which will be used to register the replicated VM, and how you want to handle the target directory.
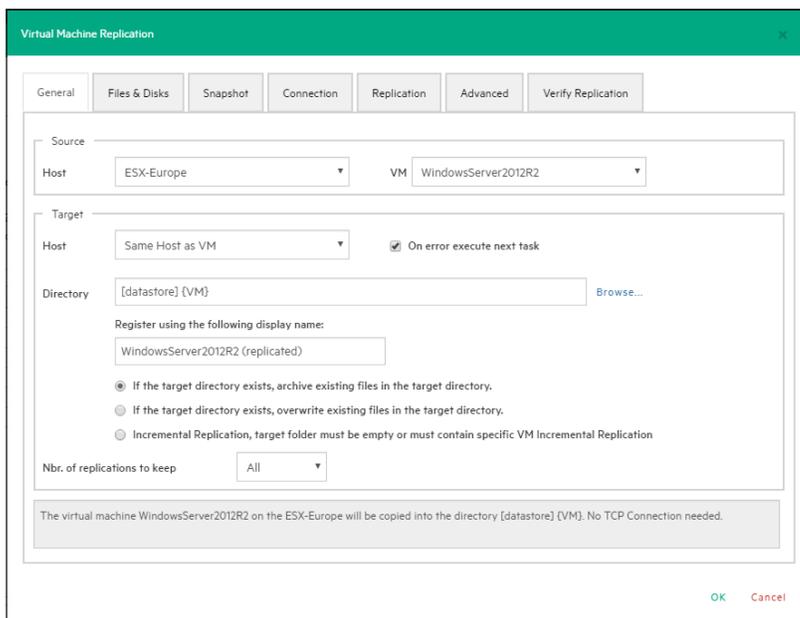
Replication - General

> **NOTE:** Selecting **Overwrite existing files in the target directory** will overwrite the previous replication only after the successful execution of the new one. The purpose is to always preserve a functional replication, so make sure there is enough free space to temporarily hold both replications. Selecting **Delete existing Replication in the target directory before the Replication starts** will erase your existing replication before the execution of the new one. If the replication process fails, you will have no replications available, so proceed with caution.

Virtual Disk Development Kit (VDDK) must be activated to make an incremental replication, so this procedure only applies to licensed ESXi hosts, not to the ESXi free version. If the host's VD Service is not activated, you will be prompted to initialize VDDK for the ESXi server. Click **ESXi Server Settings** and then, in the **How to Enable Virtual Disk Service** dialog box, download VDDK and/or initialize VDDK for the host. When finished, click **Close**.
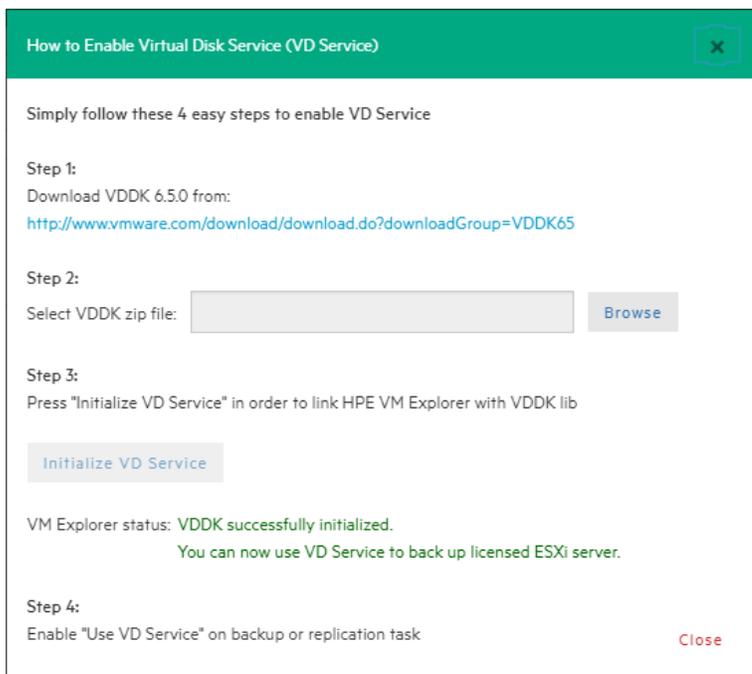
Replication - Enable VD Service
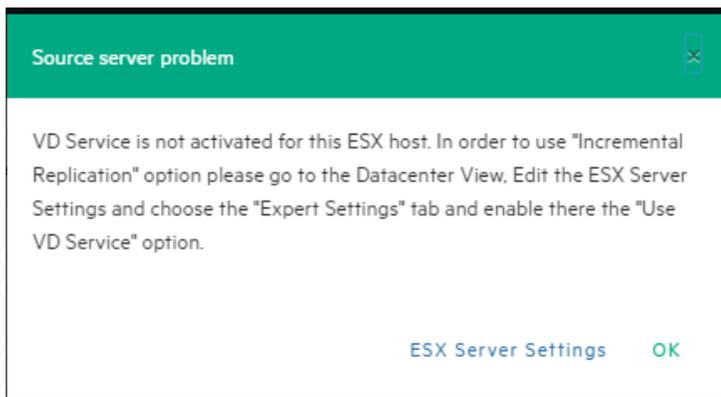
Replication - VD Service dialog

2. Selecting **Overwrite existing files in the target directory** will overwrite the previous replication only after the successful execution of the new one. The purpose is to always preserve a functional replication, so make sure there is enough free space to temporarily hold both replications.

3. In the **Files & Disks and Snapshot** screens, the procedures you need to perform are similar to backing up a VM. For more information, see Backing up a single VM, on page 78.

4. In the **Connection** tab, configure the direct copy options, which enable you to directly transfer files between the source and target server. You can reverse the TCP connection direction (default is from the source server to the target server) for Network Address Translation (NAT).

   You can also compress data during transfer, but you cannot keep the data compressed at destination for replications because at the end of the replication process the VM will be registered on the target server. Also, the direct copy options are not available if the ESXi source or target server, and the HPE VM Explorer Agent are not enabled. In addition, this type of replication does not support encryption.

5. In the **Replication** tab, you can choose to shut down and replace the replicated VM, if it is already powered on manually. Also, for incremental replication, you can choose to preserve any desired number of Restore Points, which you can revert to, if needed, whilst keeping the previous version replicated.
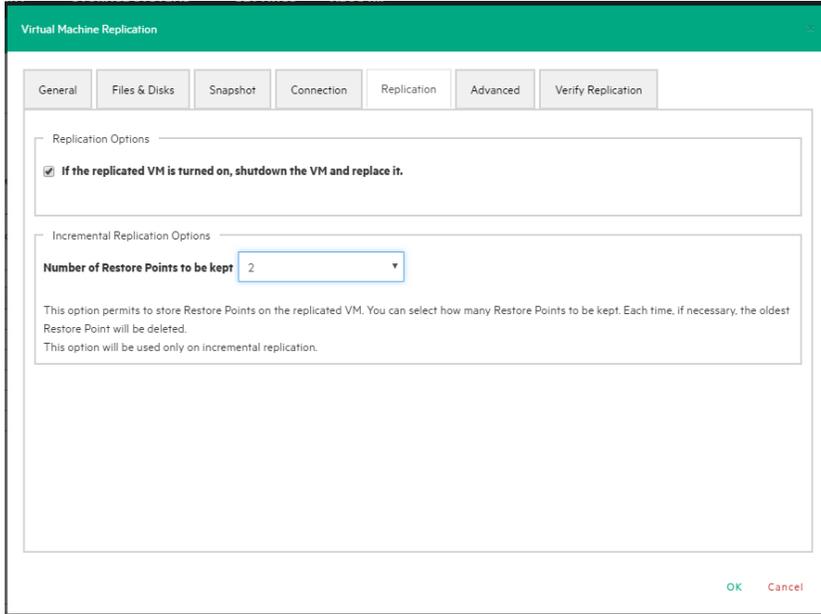
Replication - Replication tab

6. For information on how to configure the **Advanced** tab, see Backing up a single VM, on page 78.

7. In the **Network Adapters** tab (available for Hyper-V Host only), select from the list to which virtual network the (legacy) adapters should connect.
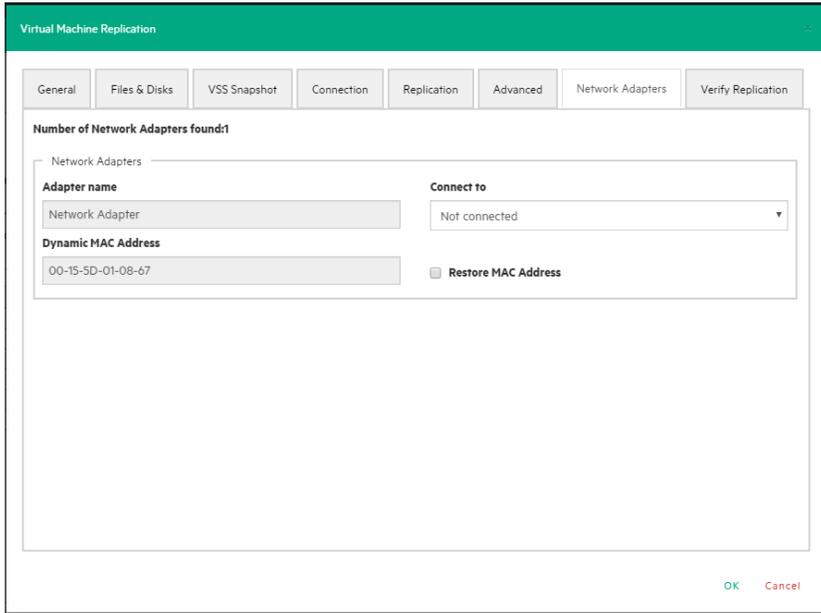
Replication - Network adapters

8. In the **Verify Replication** tab, you can enable the **File Consistency Check** feature for the target replicated VM. For more information, see Backing up a single VM, on page 78.
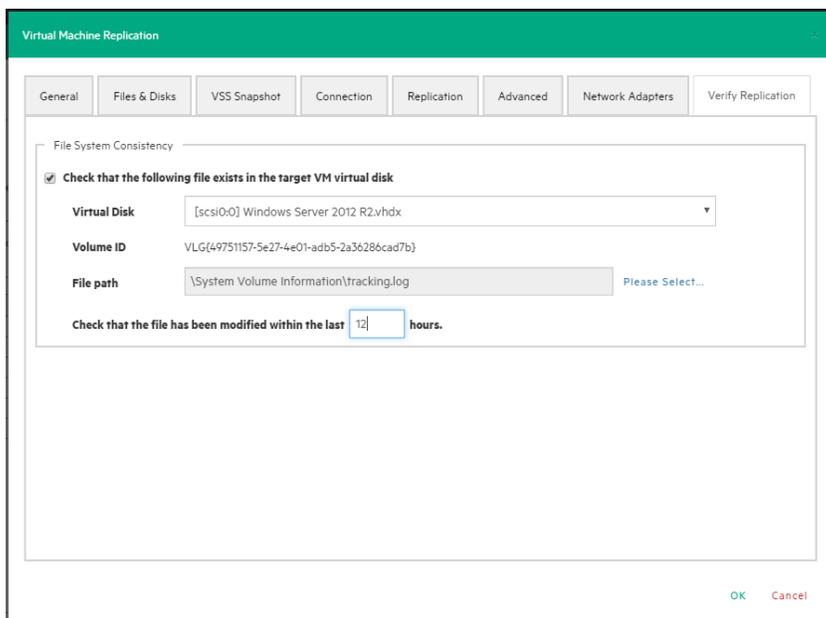
Replication - Verify replication

Replicating multiple Virtual Machines

To replicate two or more Virtual Machines (VMs), in the **Add Task Element** screen, under **Replication**, click **Multi VMs**. For more information on how to get to this stage, see Replicating One or More Virtual Machines, on page 93. Then, in the **Virtual Machine Replication** dialog box, configure the boxes in the specific tabs, as described in Replicating a single Virtual Machine, on page 93.

The difference with the single VM replication procedure is that here you can select two or more VMs by clicking **Select VMs** in the **General** tab and picking the desired VMs in the **Select Virtual Machines** dialog box. The directory and the display name used to register the replicated VM must contain the {VM} tag.

Also, since the settings are common across every VM included in the task, in the **Files & Disks** tab you cannot select the files and disks to replicate for every single VM as everything on these machines will be replicated.

Replication Explorer

For an overview of any replications performed with HPE VM Explorer, go to *Management > Replication Explorer*. You can filter the replication entries using the filters to the right. You can also power on/off every replicated VM by right-clicking the registered VM and selecting the desired operation.
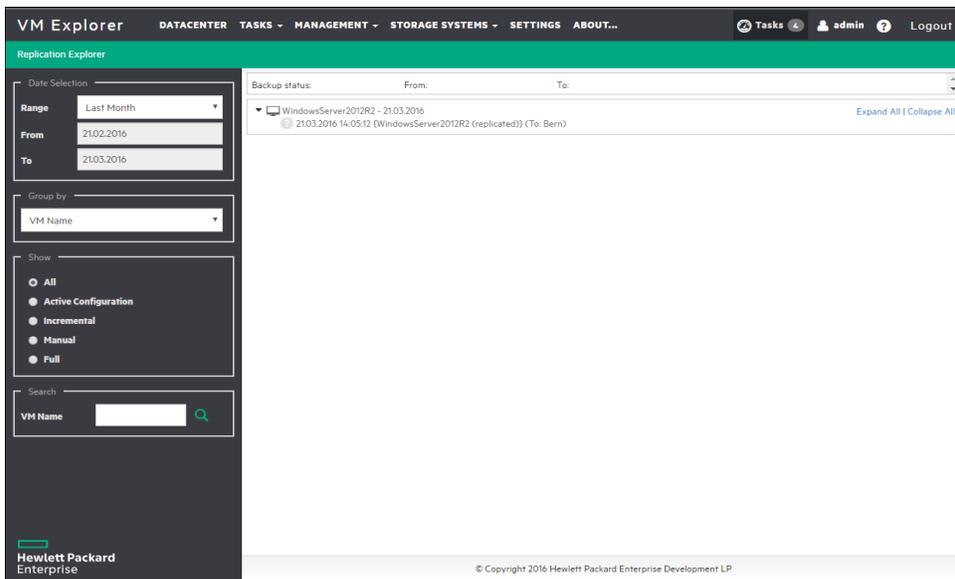
Replication Explorer

Restoring a VM Backup

In HPE VM Explorer, restoring a VM backup is a simple operation. Depending on your type of backup you want to restore, the user interface during this operation may vary.
To restore a backup in HPE VM Explorer, Professional and Enterprise editions, you need to go to **Management > Backup Explorer**, filter to view the desired backups, if needed, then right-click the backup you want to restore and point to **Restore**.

Here is the compatibility matrix of supported hypervisors you can use to restore a previous **incremental backup** of a VM:

Hypervisors	ESXi free target	ESXi licensed target
ESXi free source	√	√
ESXi licensed source		√

Hypervisors	Hyper-V 2008 R2/2012 /2012 R2	Hyper-V 2016 with Microsoft CBT	Hyper-V 2016 with HPE VM Explorer Agent
Hyper-V 2008 R2/2012 /2012 R2	√	√	√
Hyper-V 2016 with Microsoft CBT		√	√
Hyper-V 2016 with HPE VM Explorer Agent	√	√	√

To restore a backup in HPE VM Explorer Free Edition or to restore any backup not listed in **Backup Explorer**:

1. Go to *Management > File Explorer*, open the desired backup folder and right-click the `vmxbackup.xml` file, which contains all the information about your original VM. On the shortcut menu, point to **Restore Backup...**

2. In the **Virtual Machine Restore** dialog box, in the **General** tab, choose the target host where you want to restore the backup, select the directory and whether to directly register the VM to your inventory using the default name. If not, you can always register any VM to your datastore by going to **File Explorer**, right-clicking the VM configuration file (**.vmx* for ESXi VMs or **.xml* for Hyper-V VMs) and pointing to **Register VM**. Also, you can power on the VM after registration.
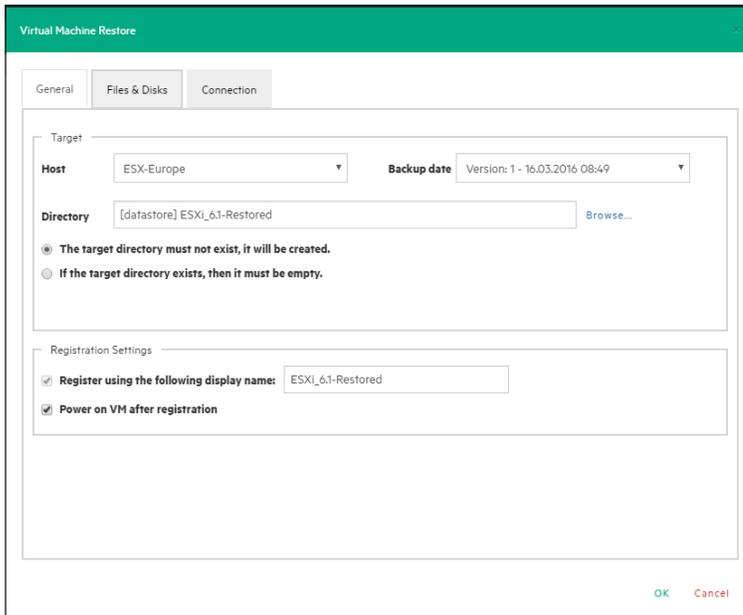
Restore - General

3. In the **Files & Disks** tab, choose which file/disk you want to include in the restore and whether to convert the disks as thin after restore (if your Target host is ESXi, HPE VM Explorer Agent is enabled on the target server and there are no other disks with the same name).
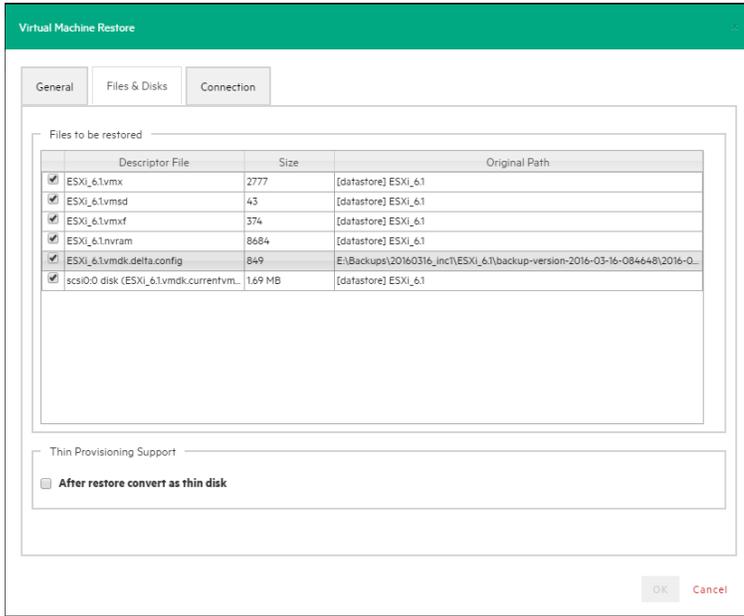
Restore - Files & Disks

4. In the **Connection** tab, configure the direct copy options. The procedures are similar to
   Replicating a single Virtual Machine, on page 93.
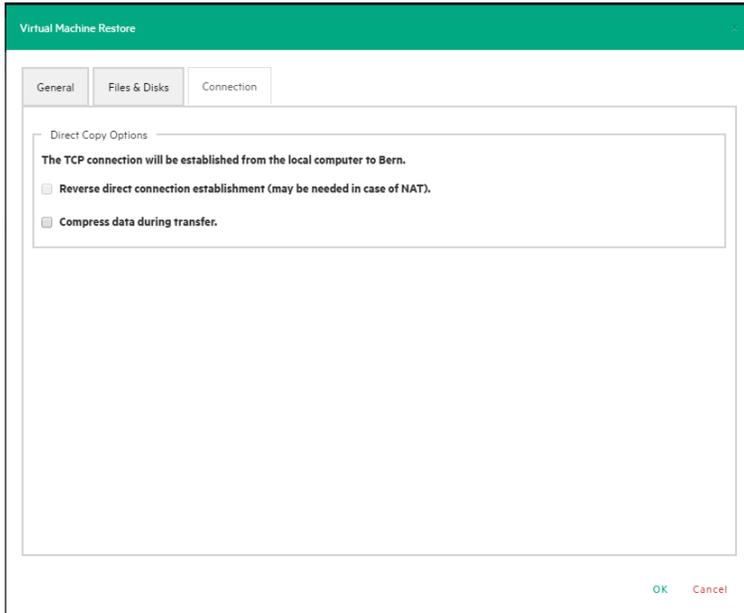
Restore - Connection

5. (Hyper-V Host only) In the **Network Adapters** tab, in the **Connect to** list, select which virtual
   network the network adapters and the legacy network should link. You can restore all saved
   network adapters in the new VM. To automatically set the old MAC address on the adapter, select
   Restore MAC Address. When finished, click **OK**.

Restoring an incremental backup

When restoring an incremental backup, you can choose up to which date to restore the date – more exactly, you can choose a specific restore point to restore. The other procedures are identical to regular backup restores. For more information, see .
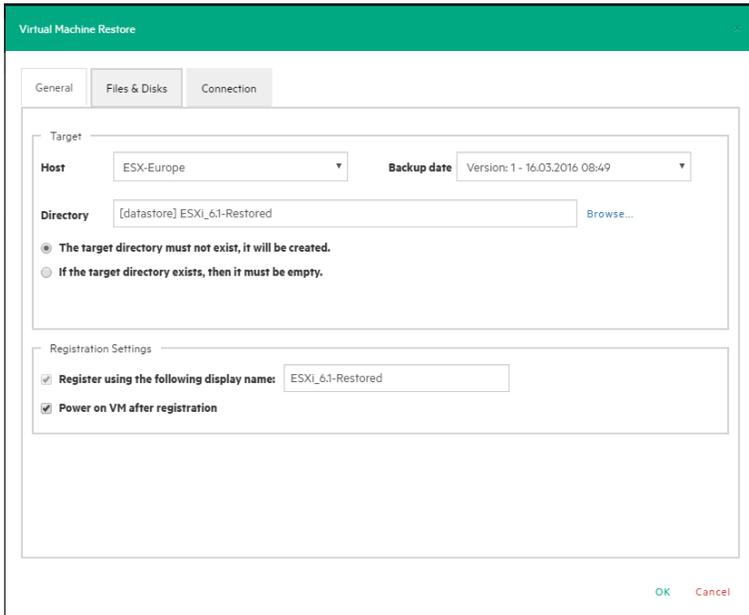
Restore Incremental Backup - General

Restoring an encrypted backup

When restoring an encrypted backup, make sure you know the password.

To restore an encrypted backup

1. Right-click the encrypted backup (indicated by a yellow padlock) and click **Restore**.

2. Enter the backup encryption password.
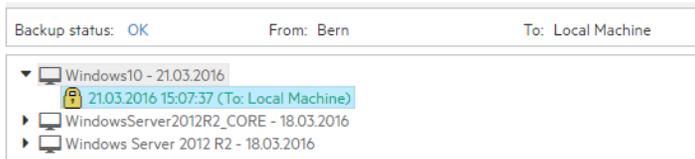
Restore encrypted backup

The standard restore dialog is displayed.

When using Instant VM Recovery and File Level Restore, HPE VM Explorer prompts you to enter the password in order to proceed with the operation.

Recovering Single Items

With HPE VM Explorer, you can recover individual files such as Exchange Server items (e-mails) or various individual files from your backup.

File level restore for single files

HPE VM Explorer supports the following file systems on disk image files for file level recoveries:

- NTFS
- FAT
- Windows Dynamic Disks (simple, spanned, striped, mirrored volumes)
- Linux—EXT (2 and 3, and EXT 4 is supported for both 32 and 64 bits versions)
- Linux LVM—Logical Volume Manager (linear, striped, mirrored volumes)
- Linux—XFS

If the EXT partition in the selected image disk is not 100% consistent, you will be notified in this respect, however, you can continue navigating the image disk. To generate consistent disk images, we recommend that you enable the quiesce option for the backups.

Disk image warning

You can recover single or multiple files either from the **File Explorer** or from **Backup Explorer**.

To recover one or multiple files from **File Explorer**:

1. Go to **Management > File Explorer** and navigate to the backup entry from which you want to recover one or more files.
2. Select which file(s) you want to restore, either by choosing an individual file or multiple files while holding the **Ctrl** key pressed. Then, right-click and point to **Download** on the shortcut menu to download the file(s) as a ZIP archive using the regular browser download procedure.

To recover one or multiple files from **Backup Explorer**:

1. Go to *Management > Backup Explorer*, expand the desired backup entry and wait for the information to refresh. After refresh, successful backup entries are marked with a 🟢 green check icon, while failed backup entries due to inconsistent files are marked with an "X" 🔳 red icon.
2. Right-click the valid backup entry you want to restore and point to **Locate Files...** on the shortcut menu. The various files on the VM are displayed.
3. Select which file(s) you want to restore, either by choosing an individual file or multiple files while holding the **Ctrl** key pressed. Then, right-click and point to **Download** on the shortcut menu to download the file(s) as a ZIP archive using the regular browser download procedure.

> **NOTE:** Depending on the number and size of the files inside a folder that you want to restore, the operation can take some time.

Recovering Microsoft Exchange Server message(s)

This feature currently applies to the Enterprise Edition of HPE VM Explorer.

> **NOTE:** HPE VM Explorer supports Microsoft Exchange Server versions 2013 and 2016.

To recover an Exchange Server item:

1. Go to **Management > Backup Explorer** and then navigate to the VM of your choice by expanding the list of available backups.

2. Right-click the VM that you want to recover the Exchange Server item from and point to **Recover Exchange Server Items...** on the shortcut menu. The **Exchange Server Items Recovery** wizard is displayed.

3. In the **Exchange Server Location** wizard screen, select the location of the Exchange Server installation. You can either:
   a. Let HPE VM Explorer scan the available disks automatically, or
   b. Select a location manually by clicking the **Please Select** button and choosing the desired folder in the **Choose Directory** dialog box.

   > **NOTE:** Make sure you have enough disk space on your computer to accommodate the entire Exchange Server database you are retrieving. You can configure the Exchange Recovery data path in the **Settings** section of HPE VM Explorer. For more information, see Configuring General settings, on page 117.

   When finished, click **OK** to return to the **Exchange Server Items Recovery** wizard and then click **Next**.

Exchange Server Recovery wizard – select location

4. In the **Database Selection** wizard screen, you can see the database detected by HPE VM Explorer as well as its recovery status:

   - **Not Ready**—Before the extraction of the temporary recovery data from the backup.

   - **Ready**—When extraction is successful.

   You can delete the temporary recovery data on the local machine by clicking the **Close** button. If you want to manually select another Exchange Server database, click **Add Exchange database** and then choose the desired one in the **Select File...** dialog box. When finished, click **OK** to return to the **Database Selection** wizard screen and click **Next**.

Exchange Server Recovery wizard – Select database

5. In the **Database Preparation** wizard screen, you can see the process of extracting and consolidating the Exchange database for recovery. The temporary recovery data is automatically saved in the location configured in the *Settings>General* section. For more information, see Configuring General settings, on page 1. If the operation is not successful, click **Refresh** to verify your Exchange Server settings and then go back in the **Exchange Server Items Recovery** wizard to make the necessary changes. If the operation is successful, click **Next**.

Exchange Server Recovery wizard – Prepare database

6. In the **Exchange Item Selection** wizard screen, you can see the mailboxes of all the users in the selected Exchange Server database.

   a. If you want to restore individual e-mails, expand the user name(s), navigate to the desired mailbox folder and select the e-mail you want to recover.

   b. If you want to restore all the e-mails associated to certain users, select the checkboxes next to the user names.

   You can select/clear all the users whose e-mail mailboxes you want to recover by clicking the respective buttons. Also, you can collapse all expanded user accounts by clicking **Collapse All**. You can recover any types of e-mails irrespective of their folder or whether or not they have one or multiple attachments. When finished, click **Start Recovery**.

Exchange Server Recovery wizard – Select Exchange Server items

7. When the process is complete, you can download the recovered item(s) as a *.ZIP* file. In order to copy back one or more e-mails to production, simply drag-and-drop them into your Microsoft Outlook mailbox. Then, you can continue the recovery process by clicking **Yes** in the confirmation message or you can click **No** to exit the **Exchange Server Items Recovery** wizard.

> **NOTE:** Make sure your browser allows pop-ups from HPE VM Explorer.

Scheduling Tasks

With HPE VM Explorer you can schedule tasks to run certain operations (such as backups, replications, copy backups and so on) automatically at configurable time intervals, such as hourly, daily, weekly and so on.

Creating a scheduled task

You can schedule a task to perform a large variety of operations (such as backups, replications, copy backups, e-mail reporting and so on) in the *Tasks > Scheduled Tasks* view or you can simply schedule a backup/replication task in the **Datacenter** view.

To create a scheduled task from the **Scheduler** view:

1. Go to **Tasks > Scheduled Tasks**, click **Add Scheduled Tasks** and point to **Add Scheduled Task**.

2. In the **Add Scheduled Task** dialog box, give a meaningful title to your task and configure the schedule according to your preferences. When finished, click **OK**.
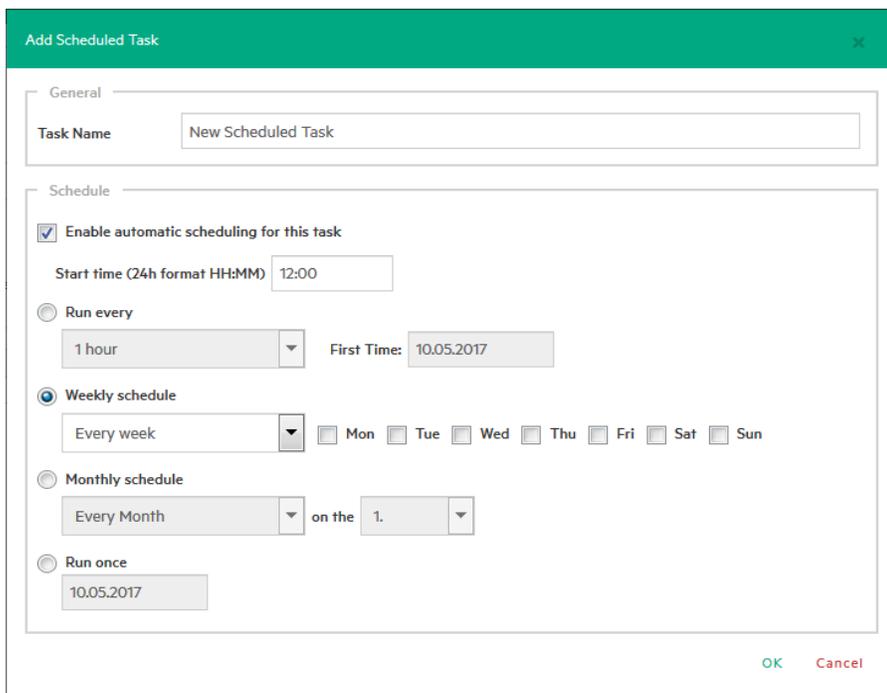
Add Scheduled Task

3. Next, in the **Scheduled Tasks** view, click **Add** and then select which kind of scheduled task you want to perform:

   - Backup—for more information, see Backing Up One or Multiple Virtual Machines, on page 77

   - Replication—for more information, see Replicating One or More Virtual Machines, on page 93

   - Copy backup—for more information, see Copy a backup, on page 90

   - E-mail report—for more information, see Sending E-mail Reports, on page 111

   - Custom script—for more information, see Custom script, on page 111

4. To modify your entries at any time, switch to **Scheduler** view. You can also add multiple steps to a single backup task, meaning that you can add backups of multiple Virtual Machines to the same task.

   > **NOTE:** Make sure that you enable the scheduler in HPE VM Explorer by clicking **Enable the Scheduler** in the **Scheduler** View.

   > **IMPORTANT:** HPE VM Explorer executes scheduled tasks using its own Windows Service that executes scheduled tasks. When using the HPE VM Explorer service you do not need to be logged on and have HPE VM Explorer running to perform scheduled tasks. In addition, if the scheduler is enabled and the **General Settings** option **Prevent 'Sleep Mode' if scheduler is enabled** (*Settings > General Settings*) prevents the system's Sleep Mode (if activated). Also, make sure your Windows updater will not cause your computer to restart and thus interrupt your backup/restore operations.

5. You can also disable a single task element in a scheduled task by clearing its check box directly in

the **Task Elements** list.
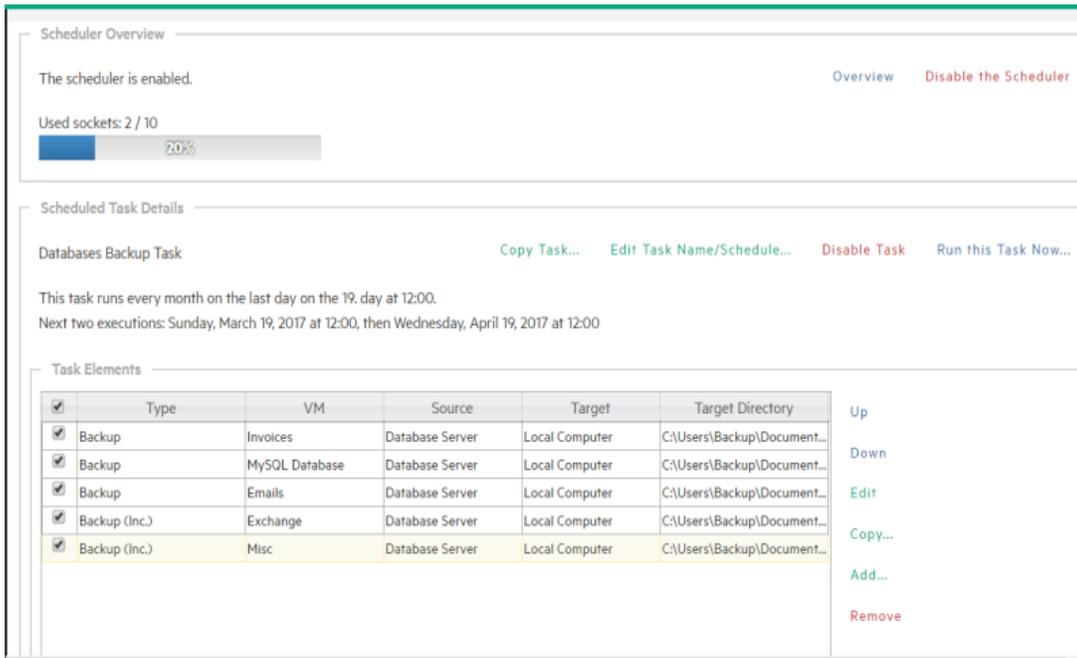
Scheduled Task screen

To create a backup/replication scheduled task from the **Datacenter** view:

1. Go to the **Datacenter** view, right-click the Virtual Machine you want to back up/replicate and then point to either **Create New Backup Schedule...** or **Create New Replication Schedule...** on the shortcut menu.
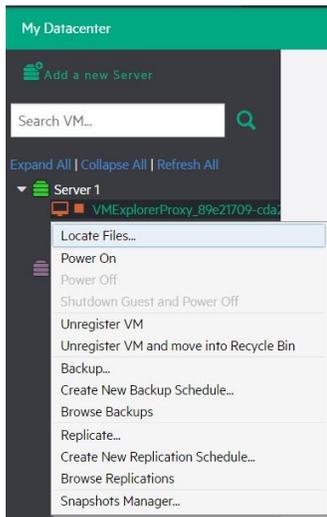
Create a scheduled task

2. In the **Add Scheduled Task** dialog box, give a meaningful title to your task and configure the schedule according to your preferences. When finished, click **OK**.
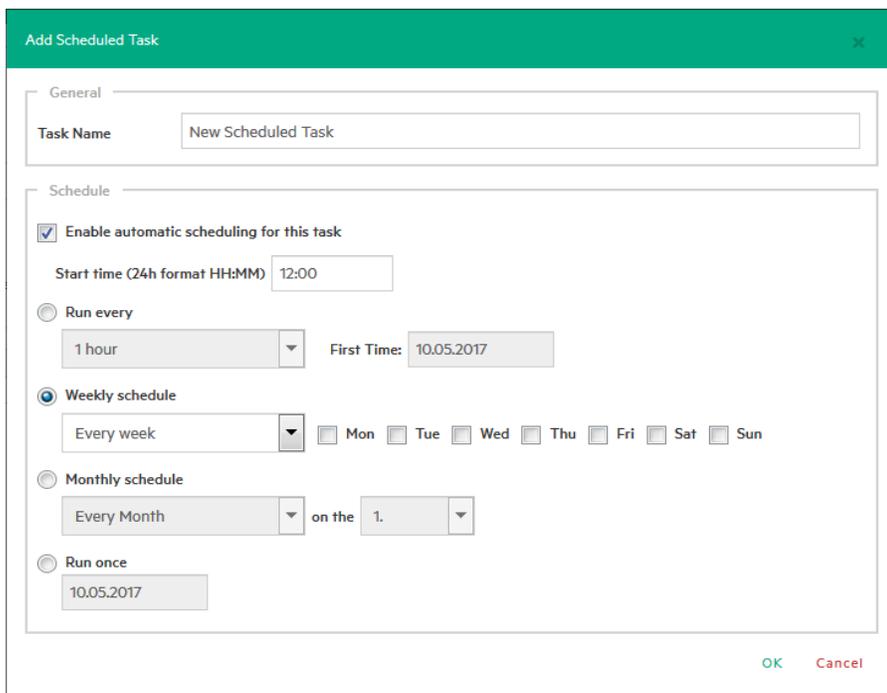
Add Scheduled Task

3. Next, follow the backup (for more information, see Backing Up One or Multiple Virtual Machines, on page 77) or replication (for more information, see Replicating One or More Virtual Machines, on page 93) procedures.

Copying a scheduled task

To copy a scheduled task:

1. Go to *Tasks > Scheduled Tasks*, right-click the scheduled task that you want to copy from the **Scheduled Tasks** list and point to **Copy Task…** You can also select the desired scheduled task and click the **Copy Task…** button on the **View Window**.

2. In the **Edit Scheduled Task** dialog box, you can modify any of the task's inherited settings. When finished, click **OK**. To avoid multiple running tasks and any potential conflicts, the copied task is disabled (Paused) by default, so you have to click **Enable the Scheduler** in the **Scheduler** view.
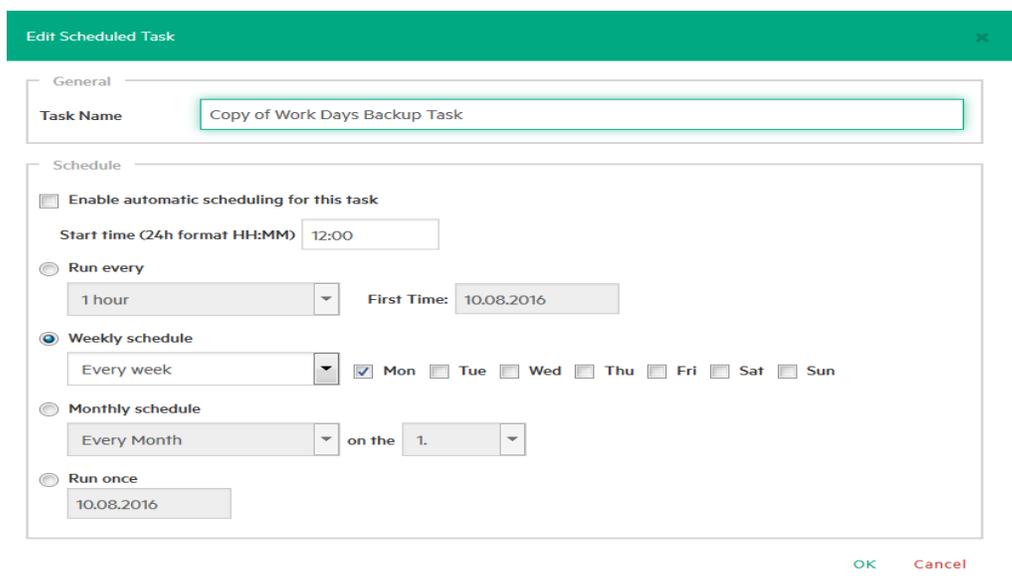
Copy Scheduled Task dialog box

Copying a scheduled task element

You can copy a single task element into the same or another scheduled task. To copy a scheduled task element, while in the **Task Elements** list, right-click an element and select **Copy…**, or press the **Copy…** button to the right. Then, in the **Copy the selected Task Element** dialog box, select into which scheduled task you want to copy the selected task element. Select the target scheduled task and click **OK**.
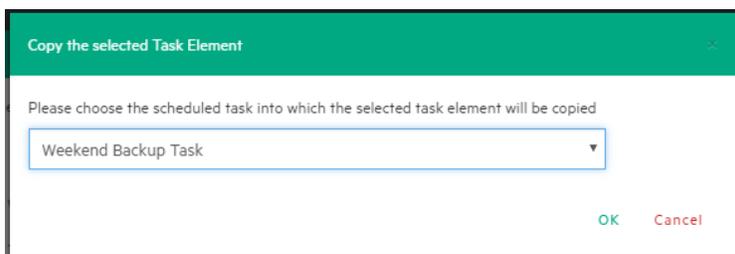
Copy Task Element dialog box

Using the Command Line Interface

HPE VM Explorer enables you to execute the scheduled tasks you created from the command line. This can be useful if you want to use a different software as scheduler, such as the Windows built-in Task Scheduler.

To access full information about the command-line interface, simply type `vmx.exe /?` at the command prompt to generate an XML file containing all the information about the executed task. You can modify the output location by adding the /logfile parameter.

To start a backup task, you need the `/runtask` option. For example, you can type:

```
vmx.exe /runtask:mytask /logfile:"c:\log files\vmx\vmx.xml"
```

Custom script

In HPE VM Explorer, you can add a custom script element to a scheduled task. To do so:

1. Go to *Tasks > Scheduled Tasks*, select the desired task and click **Add**.

2. In the **Add Task Element** screen, under **Other**, click **Custom Script**. The **Script task setup** dialog box is displayed.

3. In the **Script task setup** dialog box, click **Browse** to select the script you want to run. You can select a `.bat` or `.exe` file and you can configure the arguments, timeout interval (the time after which the task fails if the script has not finished) and whether the task should stop or continue if the script fails. You also can select an existing account to launch the script file and you can test your script configuration before adding it as a task element. When finished, click **OK**.
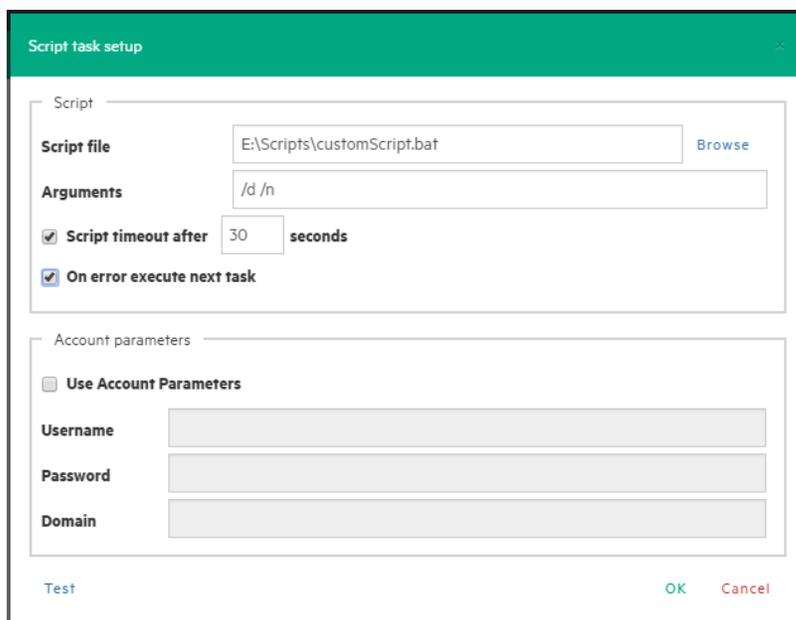
Script task setup screen

Sending E-mail Reports

HPE VM Explorer has a built-in option to automatically send e-mail reports about a backup, copy backup, replication and other operations. To add e-mail reporting, you can either configure HPE VM Explorer to use e-mail notifications after performing a task or you can add a scheduled e-mail notification task.

Adding e-mail reporting as a scheduled task

1. Go to *Tasks > Scheduled Tasks*, right-click the **Scheduled Tasks** view and point to **Add Scheduled Task...** on the shortcut menu.

2. In the **Add Scheduled Task** dialog box, give a meaningful name to your e-mail reporting task and set the report schedule. When finished, click **OK**.

3. In the **Scheduled Tasks** view, click **Add** and then, in the **Add task element** screen, click **E-mail Report**.

4. In the **E-Mail Report Wizard** screen, in the **Setup Type** screen, select whether you want to:
   a. **Create an e-mail report task from scratch**, in which case you can configure other e-mail communication settings than the default ones, in the **E-Mail Default Settings** screen.

   b. **Use the default e-mail communication settings**, as configured in the **E-Mail Default Settings** screen, as a template for your report.

   If you have not already configured the default e-mail communication settings, you can do so by clicking the **Edit default settings** button. For more information, see Configuring e-mail default settings, on page 120. When finished, click **Next**.

E-mail Report Wizard —Setup Type screen

5. In the **Sender & Receiver** wizard screen, type the Sender's e-mail address and (optionally) full name, as well as the Receiver's e-mail address(es) and the subject line. When finished, click **Next**.
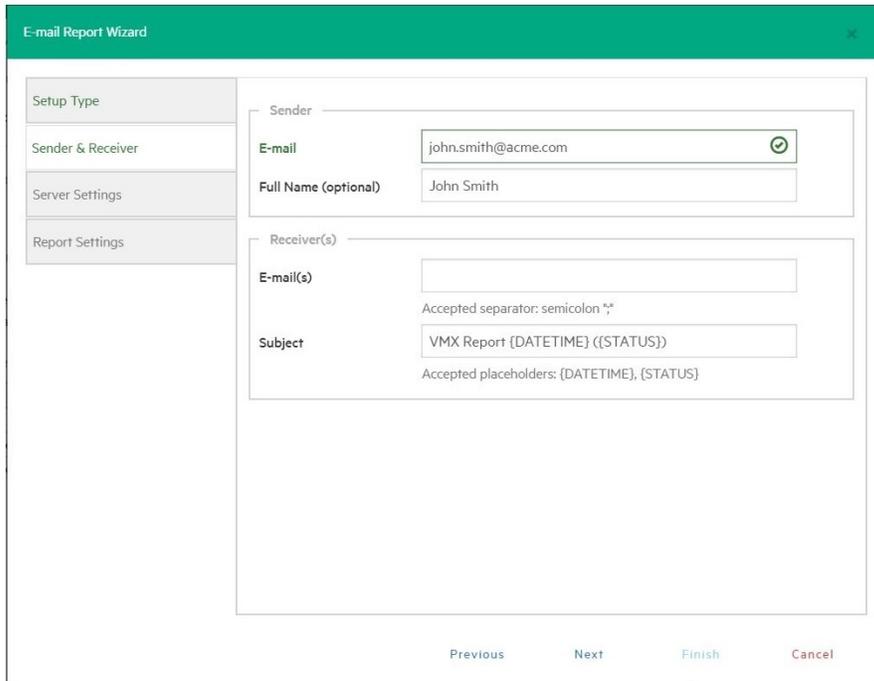
E-mail Report Wizard—Sender&Receiver screen

6. In the **Server Settings** wizard screen, type the hostname or IP address and the port and select whether you want to use SSL or SMTP authentication (if permitted by the server, in which case you also need to provide the username and password). Then, you can verify whether your settings are correct by clicking the **Test** button. When finished, click **Next** to continue or **Finish** if you do not want to configure e-mail priority.
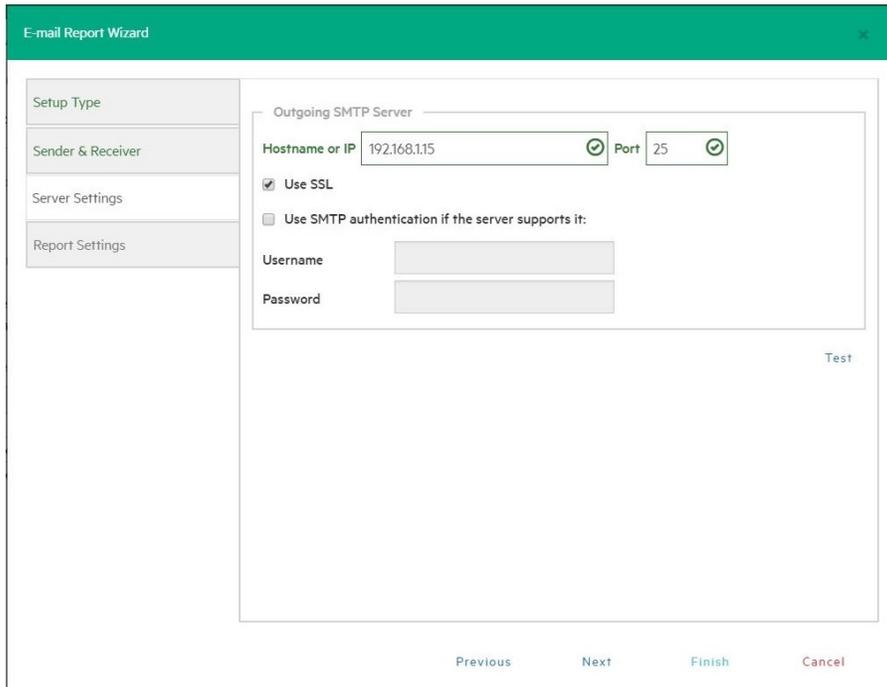
E-mail Report Wizard—Server Settings screen

7. In the **Report Settings** wizard screen, you can set the priority of the e-mail sent in case of success, warning or error on jobs. When finished, click **Save**. You will be taken to the **Scheduled Tasks** view.
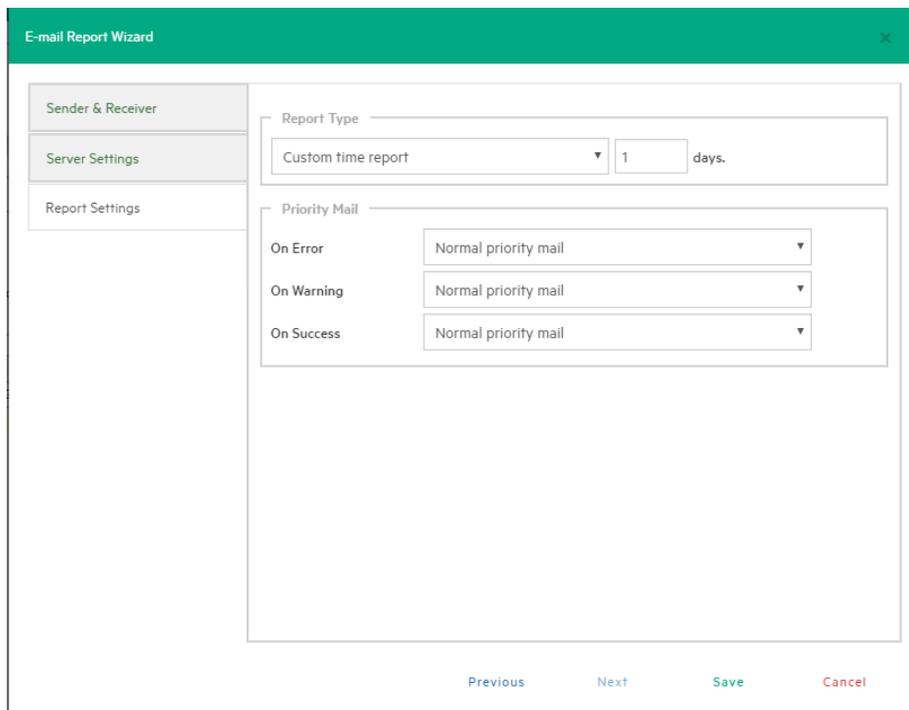
E-mail Report Wizard—Report Settings

Types of reports

The following report types are available in HPE VM Explorer:

- **Current task report**—Sends a report of the scheduled task to which the report has been added. It is usually implemented at the end of a scheduled task with multiple tasks, to keep you informed on specific scheduled task.

- **Daily report**—Sends a report with the activities occurred in the past 24 hours, including jobs still running, jobs terminated in the past 24 hours and their results, whether or not the jobs have been included in the task or not. It is usually implemented in a daily scheduled task of its own, to keep you informed on all activities executed every day.

- **Weekly report**—Works the same as the Daily report, but integrates jobs in the past week.

- **Monthly report**—Works the same as the Daily report, but integrates jobs in the past month.

- **Custom time report**—Works the same as the Daily report, but for a specified time frame in which all the jobs executed (including the ones still running) are included in the report.

> **CAUTION:** If you have not configured automated backup tests to take screenshots of the VM console, the report will contain all the images selected for the report. Be careful on the size of the report as it may reach the maximum capacity of the mail server.

Working with File Explorer

File Explorer enables you to view and download files from your ESX, Hyper-V, Linux or FreeBSD hosts and select the server you want to browse. Simply go to *Management > File Explorer* and select the server from the **Server** list.

In addition, you can register Virtual Machines to your ESXi or Hyper-V hosts by right-clicking the VM configuration file (`*.VMX` for ESXi VMs or `*.XML` for Hyper-V VMs) and choosing the **Register VM** command. You can also restore backups by right-clicking the *vmxbackup.xml* file and pointing to **Restore Backup...**
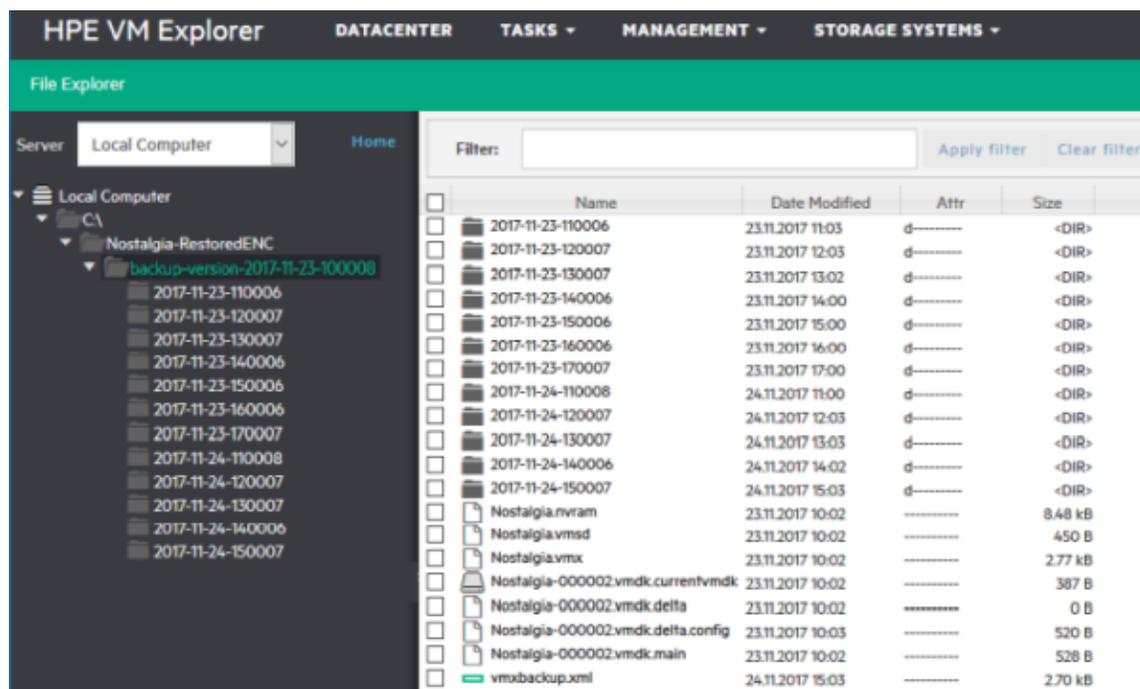
File Explorer

How to use the filtering feature in HPE VM Explorer

HPE VM Explorer provides you with the possibility to filter the files displayed in File Explorer. Keep in mind the following:

- To perform a search, type the desired key words in the **Filter** box and then press **Apply filter**.
- To clear your search criteria, simply press **Clear filter**.
- Wildcard (*) search is supported. Any search returns results that match the specified combination of characters and wildcards.
- When the search returns a significant number of files, only the first 1,000 files are displayed. We recommend that you further refine your search if you are looking for specific files.

Viewing Task History

Go to *Tasks > Task History* to have an overview of recent tasks, with the name, the start and end time, the duration of the task and the result.

Task History screen

> **TIP:** You can view more details for each entry by double clicking an entry.

Click **HTML Report** to view the current task result in your browser in HTML format, ready for print. Click **Go to Task** to visit the task.

> **NOTE:** The **Go to Task** button is only available to you if the task still exists. Also, if the task has been deleted in the time interval between viewing its details and visiting the task, you will be taken to the **Scheduled Tasks** page.
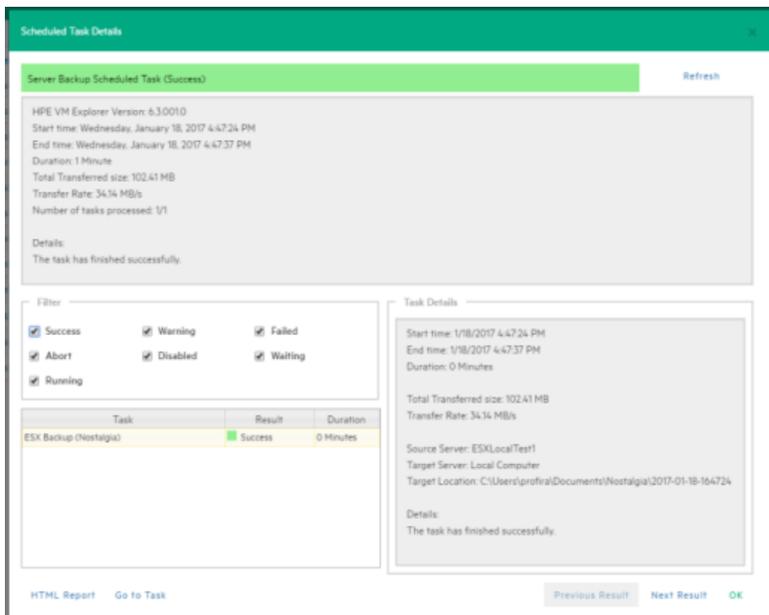
Scheduled Task Details

Working with HPE VM Explorer Settings

Go **to <user account> -> Settings** to configure your HPE VM Explorer settings, such as the language, event logs, support information, documentation and so on.

Configuring General settings

To configure some of HPE VM Explorer's general settings, such as the Default Local Path, the Windows event logs and others, in the **Settings** view, click **General**. When finished configuring the settings, click **Save**.
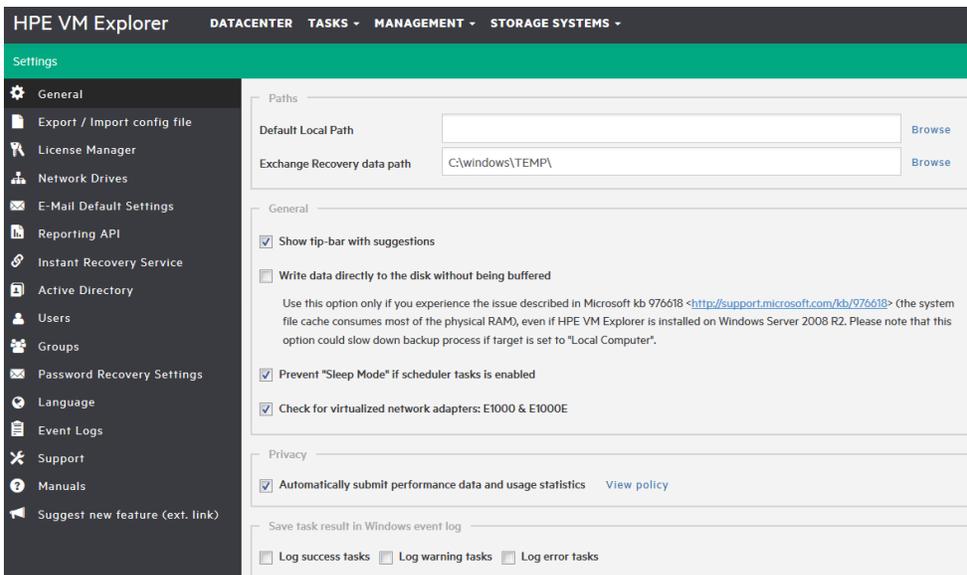
Settings - General

Under Paths

Click **Browse** to configure the default Local Path used in **File Explorer** (home directory for local computer), in the **Backup** setup dialog (default target directory), in the **Custom Script** configurator and wherever a local path is required. If left blank, HPE VM Explorer will use the Windows **My Documents** path.

Also, click **Browse** to configure the Exchange Server recovery location for temporarily storing the logs and the *.edb* database file downloaded during the recovery process. For more information on recovering individual Microsoft Exchange Server items, see Recovering Microsoft Exchange Server Message(s), on page 1.

Under General

Select/clear the **Show tip-bar with suggestions** checkbox to display/hide the tip bar with the suggestions. You can also deactivate the tip-bar by clicking **X** (close).

Select the **Write data directly to the disk without being buffered** checkbox only if, during backups, performance issues as described in the Microsoft KB 976618 occur. For more information, see https://support.microsoft.com/en-us/kb/976618.

Select the **Prevent 'Sleep Mode' if scheduler is enabled** checkbox to prevent the system from going into sleep mode. This option will be applied only if the scheduler is enabled. For more information, see Scheduling Tasks, on page 106.

Under Privacy

Here you can decide whether or not to send performance data (for statistical purposes). For more information, click **View policy**.

Under Save task result in Windows event log

To save the results of Scheduled Tasks in the Windows Event Log, select/clear the desired checkboxes under **Save task result in Windows Event Log**.

Export/Import configuration settings

In HPE VM Explorer, you can export/import the existing configuration. During export, you can encrypt the configuration file with a password (recommended).

> **NOTE:** Ensure that you are not importing a configuration with its web server settings disabled.
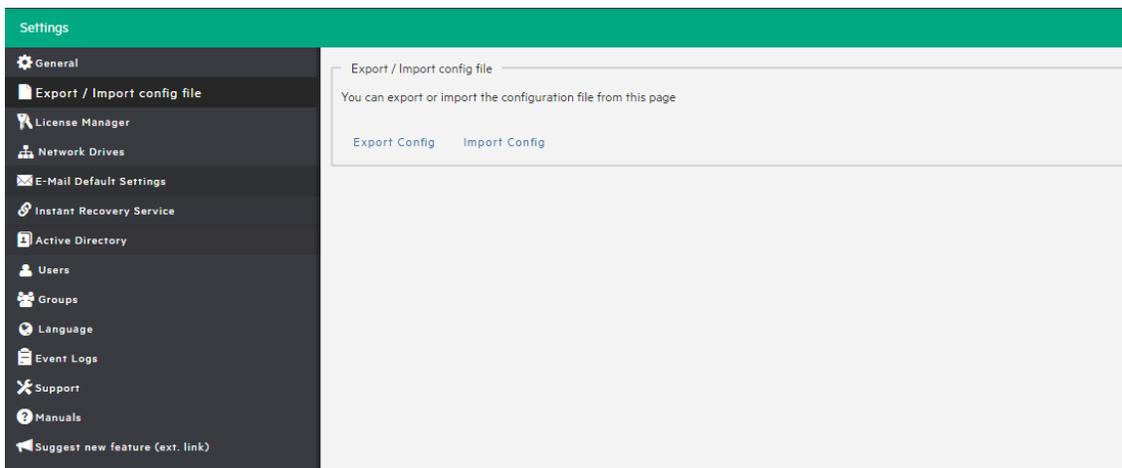
Settings - Export/Import configuration file

Managing network drives

In HPE VM Explorer, you can add, modify and delete network drives from which you can backup and restore. To view and manage network drives, in the **Settings** view, click **Network Drives**. Click **Refresh** to update the list of available network drives.

> **NOTE:** Before adding or modifying a network drive, make sure the target is available on your network and you have write access to the shared folder.

Adding a network drive

To add a network drive:

1. In the **Network Drives** view, click **Add** and then, in the **Location** screen of the **Add a network drive** wizard, select a letter for your network drive and write your network drive's path. When finished, click **Next**.

2. In the **Credentials** screen, type your access credentials, if necessary, and then click **Next**.

3. In the **Test Connection** screen, you can verify if your connection is valid. If not, you can go back and reconfigure your newly added network drive. If yes, click **Next**.

4. The **Summary** screen displays the details of your newly added network drive. At this stage you can go back and make any necessary changes. When finished, click **Finish**.

Your newly added drive is now available in the **Network Drives** view.

Modifying a network drive

To modify an existing network drive, in the **Network Drives** view, select the network drive you want to modify and click **Edit**. Then, complete the **Add a network drive** wizard. For more information, see Adding a network drive, above.

Removing a network drive

To delete an existing network drive, in the **Network Drives** view, click the network drive you want to delete and click **Remove**. Then, in the confirmation box, click **OK**.

Configuring e-mail default settings

In the **E-Mail Default Settings** screen, you can view, configure and test the default settings used for e-mail report tasks. You can also check if your settings are correct by clicking the **Test**. When finished, click **Save**.

Settings - E-mail

> **NOTE:** The settings you define here will be used when adding an e-mail report as a Scheduled Task when selecting **Create e-mail report task using default settings** in the **Setup Type** screen of the **E-mail Report Wizard**. For more information, see Sending E-mail Reports, on page 111.

Instant Recovery Service

To be able to use HPE VM Explorer NFS, make sure no other NFS server is running on the machine where HPE VM Explorer is installed, and that no other services are using TCP port 111.
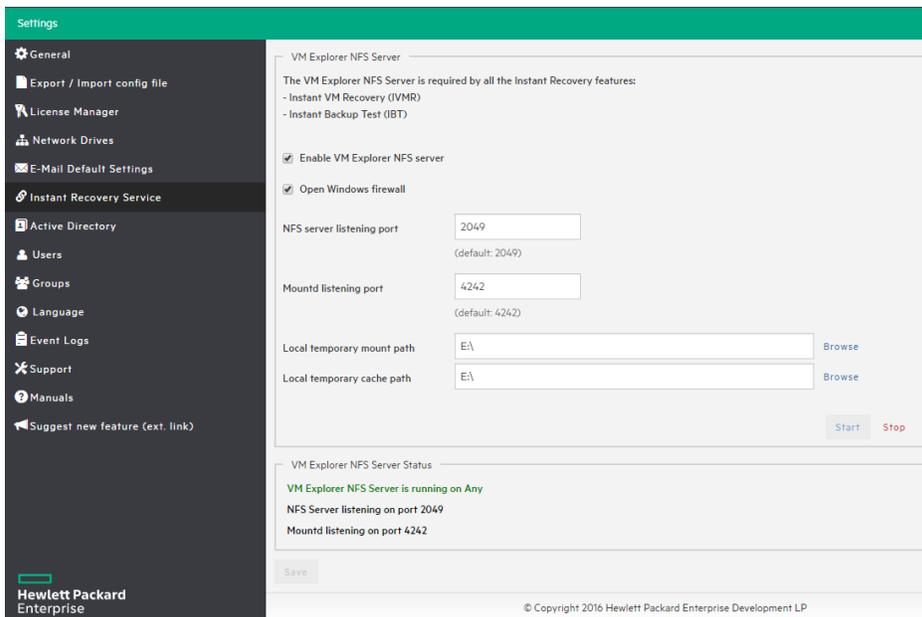
Settings - Instant Recovery Service

To be able to use the automatic backup test, you need to configure and enable the HPE VM Explorer NFS. To do so, in the **Settings** view, go to **Instant Recovery Service**. Here, you can start or stop the HPE VM Explorer NFS server.

If the **Enable HPE VM Explorer NFS server** dialog box is selected/cleared, HPE VM Explorer NFS Server will automatically start/stop when closing this dialog. Selecting the **Open Windows Firewall** checkbox will automatically open Windows Firewall for HPE VM Explorer NFS Server.

Configure the NFS server listening port and the **Mountd listening port** to be used to communicate with the NFS client on the host. Changes will apply after restarting the server.

Select the **Local temporary mount path** and **Local temporary cache path** to save temporary NFS mount files and temporary Instant VM cache files, respectively. The default value for both is your system's default Temp path. In

The **VM NFS Server Status** displays an overview of the server status.

Configuring the Active Directory

You can include Active Directory entries in your configuration and authenticate users through the Domain server using the Active Directory credentials.
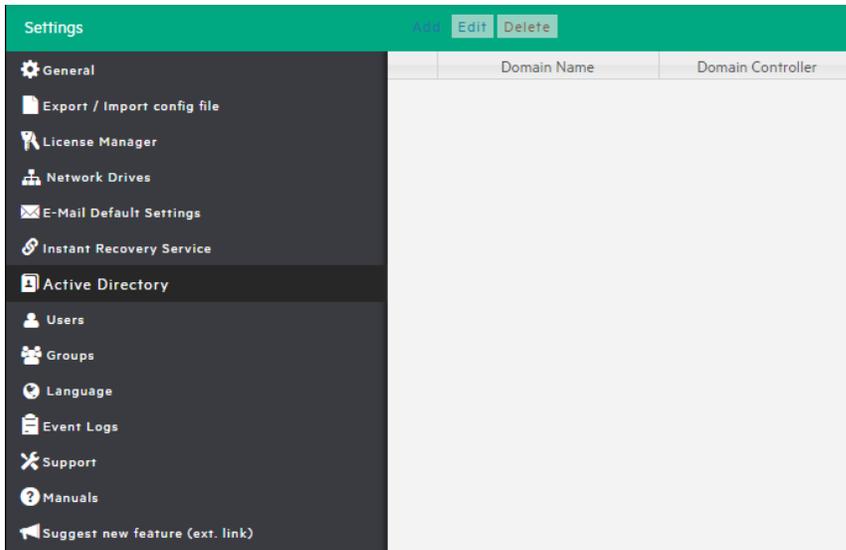
Settings - Active Directory page

To add an Active Directory entry, click **Add** and fill in the **Domain Name** and the **Domain Controller** (IP or computer name).
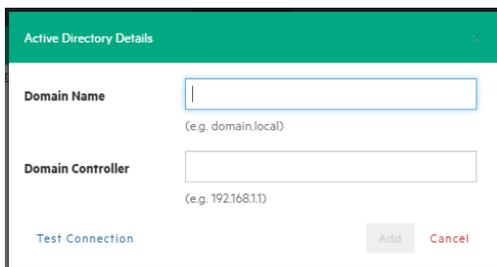
Active Directory Details

Every time you test the connection or acquire existing users in the Active Directory, you need to type your administrative credentials, as HPE VM Explorer does not store the administrative credentials in its database.

Working with Users

In the **Users** settings you can add, modify and delete HPE VM Explorer users and their access permissions. You can see the current users included in HPE VM Explorer with their detailed information.
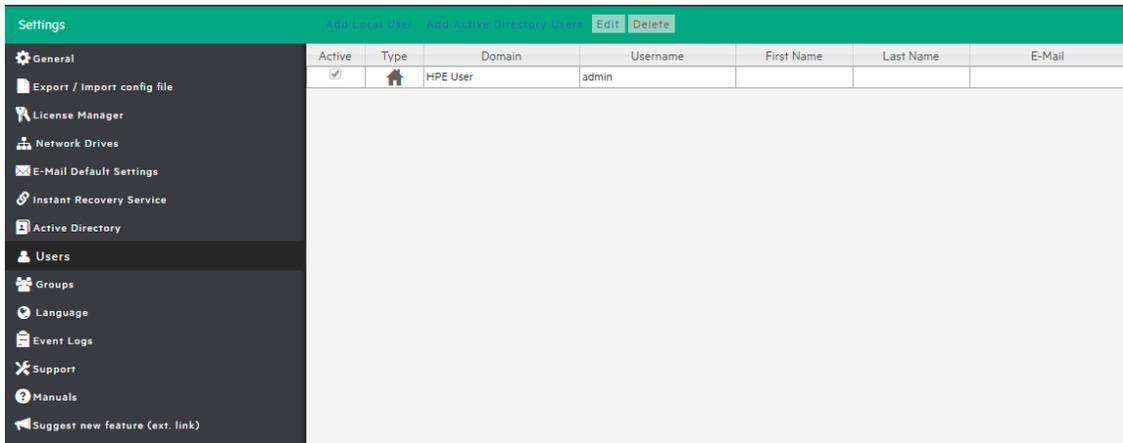
Settings - Users

To add a new local user, click **Add Local User** and then configure the requested information in the **User Details** dialog box.

Settings - User Details

Only local users are available in HPE VM Explorer, and the password is encrypted.
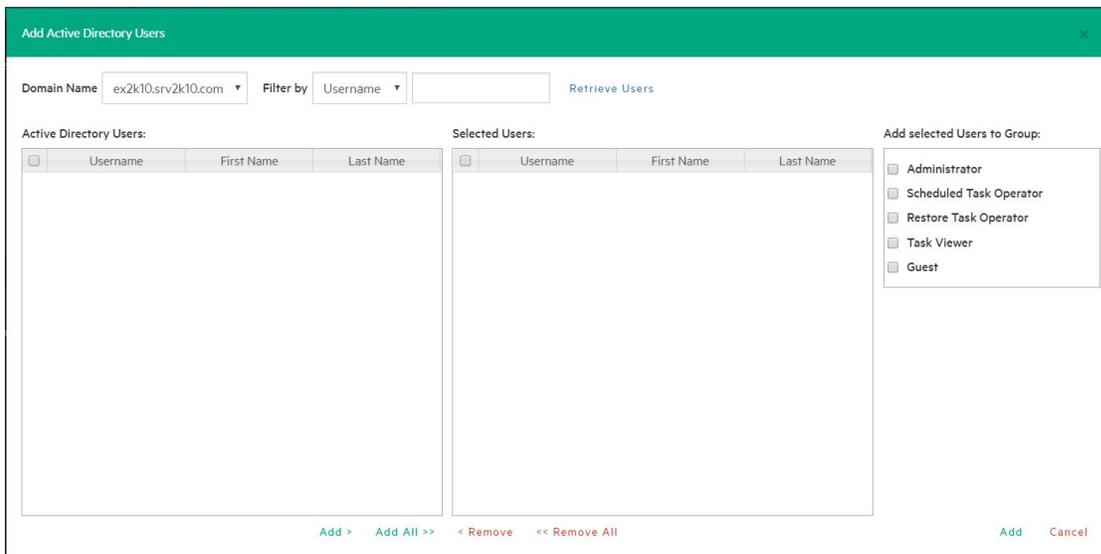
Settings - Add Active Directory Users

You can also add existing users from the Active Directories added to HPE VM Explorer (for more information, see Configuring the Active Directory, on page 122) by selecting **Add Active Directory Users** and then adding them. Also, select the desired domain name from the list and click **Retrieve Users**. Make sure you know your administrative credentials (HPE VM Explorer does not store them).

The list you retrieve is limited to 2000 entries, but you can use the **Filter** option if the user you are looking for is not present. Then, select to which group to add your users by clicking **Add selected Users to group**. Users can be members of multiple groups.

Only Administrators can modify the first name, last name, e-mail and user groups in which the user has privileges. All other fields are disabled to editing in order to keep consistency with Active Directory.

Working with Groups

You can add or exclude users in every group using the Groups Settings. The available groups are:

- **Administrator**—Can perform all administrative activities in HPE VM Explorer.
- **Scheduled Task Operator**—Can manually execute Scheduled Tasks and view the **Task History**.
- **Restore Task Operator**—Can perform restore operations using existing backups/replications and restore single files from any backup.
- **Task Viewer**—Can view all the existing backups/replications and view the **Task History**.
- **Guest**—Can view the Datacenter, the Scheduled Tasks, the existing backups/replications and the Task History in "read-only" mode.

You can modify a group and you can add and delete a user.
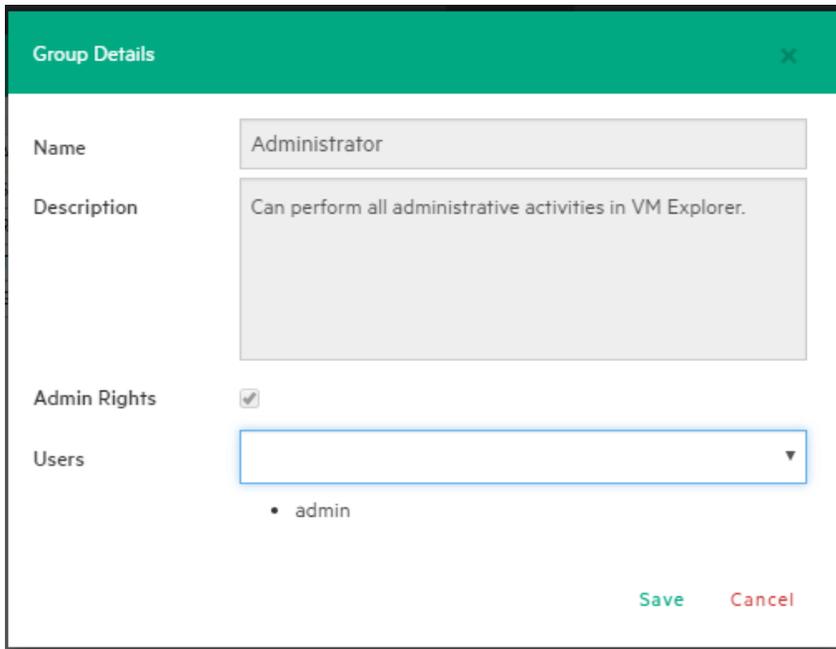
Settings - Group Details

Recovering your password

You can recover a lost password via e-mail after configuring the sender and Outgoing SMTP Server settings in the **Password Recovery Settings** screen. If you have already configured e-mail settings in the **E-Mail Default Settings** page, you can load them by clicking **Load default settings**. You can also test your e-mail settings.

Changing your display language

In the **Language** screen, you can change the language.
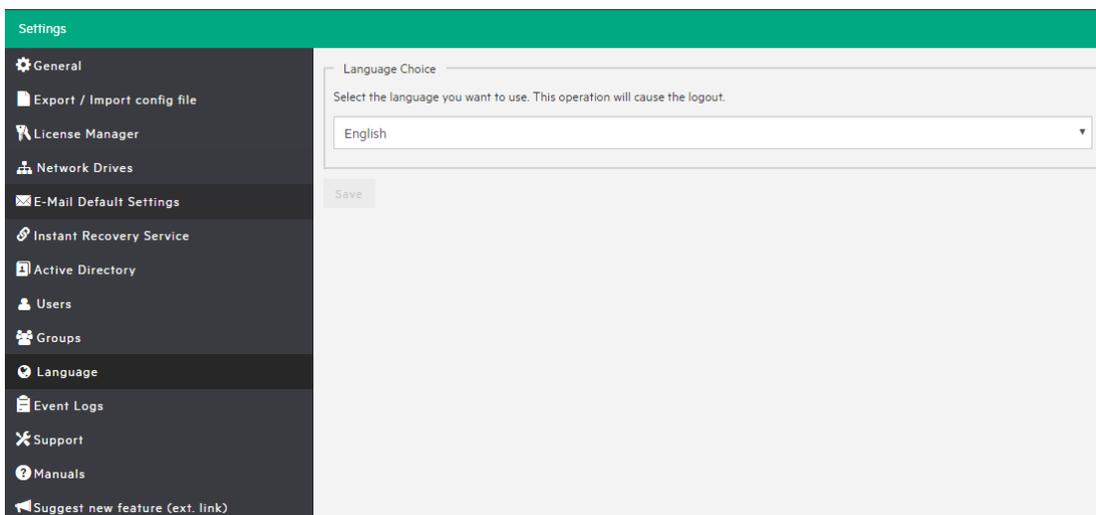
Settings - Language

> **NOTE:** Some interface elements have not been translated on purpose: dates and times, tasks details, HTML Reports, Events logs, some Service errors. Also, when selecting a different language, after applying the changes, the web application will automatically restart and you will return to the **Login** page.

You can choose from any of the following languages:

- English
- French
- German
- Italian
- Spanish
- Japanese
- Russian
- Chinese–simplified
- Portuguese–Brazilian

Troubleshooting HPE VM Explorer

This section contains information on how to troubleshoot HPE VM Explorer. We recommend that you become familiar with the procedures herein before escalating any issue you might have to HPE VM Explorer Support. For more information, see Getting Support for HPE VM Explorer, on page 140.

HPE VM Explorer best practices

We recommend that you make yourself familiar with the general troubleshooting information available herein and that you observe the following guidelines when using HPE VM Explorer. Also, given the large variety of environments into which you can run HPE VM Explorer, we recommend that you monitor yours to establish the optimal performance level.

- Enable the HPE VM Explorer Agent when adding an ESX/ESXi server to HPE VM Explorer, for faster backups/restores and more secure connections. The HPE VM Explorer Agent is a small executable responsible for transferring the files. It is deployed at the beginning of the file transfer. You can add the HPE VM Explorer Agent during the process of adding an ESXi server. For more information, see Adding an ESXi server, on page 26.
- To maximize speed, we recommend that you perform incremental rather than standard backups/replications. Prefer the "standard" alternative every time you need to save your data altogether before performing significant changes to your VM. Note that, depending on your schedule, HPE VM Explorer will perform a standard backup/replication after a certain number of incremental backups/replications (default number is 20). Depending on your needs, you can modify this default standard interval. For more information, see Backing Up One or Multiple Virtual Machines, on page 77 or Replicating One or More Virtual Machines, on page 93.

- For better performance, when adding a VM with HPE VM Explorer installed to a VMware vSphere, we recommend that you use VMXNET3 as the para-virtualized network adapter. If you use other network adapters (such as E1000 and E1000E), you get a warning message and you are advised to turn to the VMXNET3 network adapter. Also, you need to have VMware Tools installed on the VM to provide Windows with the appropriate VMXNET 3 drivers.
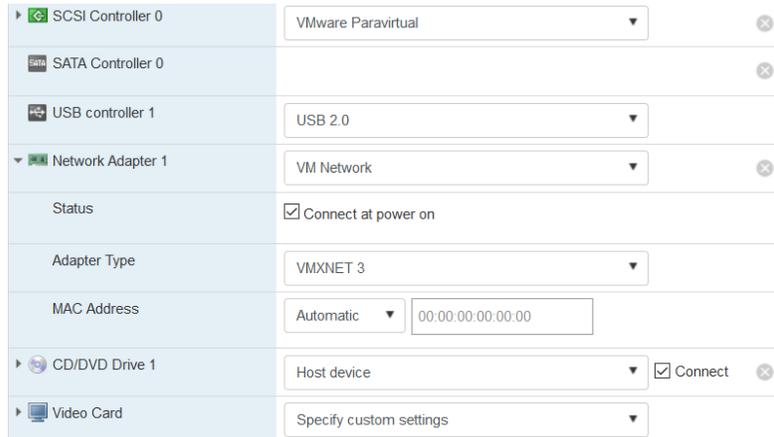
- When performing full incremental backups using Hyper-V on Windows Server 2008 R2, 2012 & 2012 R2, the first incremental backup will last longer than the subsequent ones. This is due to the fact that, even though an incremental backup will only transfer the incremental data, HPE VM Explorer needs to read the entire disk again to perform some calculations for optimal performance.

- HPE VM Explorer performs tasks sequentially and supports multiple tasks running at the same time, which can help to reduce backup windows. For simultaneous backups, HPE VM Explorer provides best performance when running a reasonable number of backups from a single ESXi/VMware vCenter at the same time. Any additional number of simultaneous backups may overload the network or the disk input/output performance.

- When performing a backup to a USB drive, make sure the disk is formatted with NTFS, not with the FAT file system.

Troubleshooting network transfers

In case your backup/restore transfer speed is low or there are bottlenecks, you can determine the cause by checking several parameters. First of all, it is important that you understand how HPE VM Explorer transfers data.

How HPE VM Explorer transfers data

This section describes how HPE VM Explorer transfers data during backup/replication.

- When performing a full/incremental backup on the local computer where HPE VM Explorer is installed, the data runs from the ESX/ESXi server to the local computer.

- When performing a full/incremental backup from the local computer to a mapped network drive, the data runs from the ESX/ESXi server to the computer where HPE VM Explorer is installed and then to the mapped network.

- When performing a backup on the same host as the VM, the data runs from/to the same server because the source server and the target server are the same. For best performance, we recommend that you enable VD Service - for more information, see Initializing Virtual Disk Service (VD Service), on page 25 - in which case the backup will be automatically executed using the host, so that you can copy the disks of the VM directly without the need of any outside communication. This process is also valid for replication, except for incremental replication, where data runs from the source server to the local machine where HPE VM Explorer is installed and then from the local machine to the target server.

- When performing a backup between ESX/ESXi with the HPE VM Explorer Agent enabled, the data runs from host to host using the HPE VM Explorer Agent connection between servers. This process is also valid for replication, except for incremental replication, where data runs from the source server to the local machine where HPE VM Explorer is installed and then from the local machine to the target server. For more information, see Determine the transfer speed of direct copy (ESX/ESXi), on page 131.

> **IMPORTANT:** The SSH (Secure Shell) File Transfer Protocol provides file access, file transfer and file management functionalities over any reliable data stream. HPE VM Explorer supports backup without SSH but **we strongly recommend** to use the HPE VM Explorer Agent which uses the SSH protocol in order to transfer the files. This provides better performance and a more stable connection on your ESXi host(s). When the HPE VM Explorer Agent is enabled, file transfers are performed by the Agent, thus avoiding the use of the ESXi webservice and increasing the overall performance and reliability of the backup.

Determine backup/restore performance of hypervisor servers

You can monitor the performance of ESX/ESXi servers and Windows Server 2008 R2 using a simple procedure.

- **To monitor the performance of ESX/ESXi servers**:

To determine the backup/restore performance of your ESX/ESXi servers, you can investigate the network speed or you can monitor the disk input/output performance on the source/target server.

To investigate the disk performance, you need to monitor the input/output performance of the host disk during each step of the backup/restore process. You can do so from the VMware vSphere Desktop Client or from the VMware vSphere Web Client.

To monitor the input/output performance of the host disk from the VMware vSphere Desktop Client:

1. Open VMware vSphere Client and go to the **Performance** tab.
2. On the **Performance** tab, select **Disk** from the **Switch to:** tab and see the current input/output speed of each disk attached to the host.

To monitor the input/output performance of the host disk from the VMware vSphere Web Client:

1. Open VMware vSphere Client and go to the **Monitor** tab.
2. On the **Monitor** tab, click *Performance > Advanced* and, from the **View** list, select **Disk** to see the current input/output speed of each disk attached to the host.

For more detailed information on monitoring, see the vSphere documentation.

To replicate the steps performed by HPE VM Explorer directly from the VMware vSphere Desktop Client:

1. Open VMware vSphere Desktop Client on the source host, right-click a test virtual machine and point to *Snapshot > Take Snapshot*.

2. In the **Take Virtual Machine Snapshot** dialog box, type a name and a meaningful description for your VM snapshot. Make sure the option **Snapshot the virtual machine's memory** is disabled and the option **Quiesce guest file system** is enabled. When finished, click **OK**.

3. Open the VMware vSphere Client Datastore Browser, click the **Summary** tab and right-click the datastore where the VM is stored. On the shortcut menu, point to **Browser Datastore...** Then, go to the folder where the test VM resides and download the disk descriptor file (*Datastore/Folder/[vm-name].vmdk*) and the disk data file (*Datastore/Folder/[vm-name].flat.vmdk*) to a local test folder on the local machine (NOT in a shared drive/folder).

4. While the file is being downloaded, monitor the disk performance, as explained earlier in this section, and count the time it takes for the download to complete. When complete, the download should include two files: the virtual disk configuration file (*[vm-name].vmdk*) and the actual disk file (*[vm-name]-flat.vmdk*) containing the data.

5. Copy or upload the data file to the backup target (ESX/ESXi host, NAS/SAN, NFS or other) and, while the upload is running, monitor the disk performance on the target.

> **IMPORTANT:**
> - Check that the whole disk is fully, not partially downloaded.
> - Time the length of the download and upload processes.
> - Monitor the disk input/output performance on both source and target.

- **Monitor the performance on a Windows Server 2008 R2**:

To monitor the performance on a Windows Server 2008 perfmon.cmdR2 (or later) machine, go to *Start > Run > cmd* and type *perfmon.msc* to open the **Performance Monitor** screen, where you can see information on the performance of your system. You can also add additional counters to monitor other factors, such as the writes/sec and so on. Also, verify the status while no backup is running, then start a backup and continue with multiple backups to discover the limit. For more information on performing a backup, see .

Determine the transfer speed between two ESX/ESXi servers

Sometimes, a backup/restore between two ESX/ESXi servers may take longer because of connectivity issues, which you can discover by determining your network speed. You can do this by using the command *scp*.

> **NOTE:** This process requires PuTTy as an SSH (Secure Shell) tool to be installed on your system.

To determine the transfer speed directly between two ESX/ESXi servers using the command *scp*:

1. In HPE VM Explorer, disable the **Task Scheduler** and check that no backup is running at the moment. For more information on the Task Scheduler, see .

2. Next, connect to the source server and create a snapshot of the VM in question. For more information, see

page. Then, disable SSH:

    a. **For the VMware vSphere Desktop Client**, go to the **Configuration** tab, under **Security Profile**, and click the **Properties...** link to the right of **Firewall**. Next, disable the SSH Client (if the SSH server is already enabled) and click **OK**.

    b. **For the VMware vSphere Web Client**, in the **Navigator** tree, right-click **Host** and point to *Services > Disable Secure Shell (SSH)*.

3. Use PuTTy to connect to the source server and execute the command: *scp "/vmfs/volumes/sourceDatastore/sourceVMFolder/sourceDisk-flat.vmdk" targetAdminUsername@targetIP:"'/vmfs/volumes/datastoreName/tempFile.tmp'"*. Then, take a screenshot to get the confirmation of the speed between the two servers in the network where the IPs *targetIP* and *sourceIP* are located.

Determine the transfer speed of direct copy (ESX/ESXi)

Direct copy enables you to transfer files between different servers and is performed automatically during a standard backup/replication if the HPE VM Explorer Agent is enabled on both servers. However, if you selected the option **Same host as VM** as a target server, under the **Target** section of the **General** tab of the **Virtual Machine Backup** dialog box (for more information, see Backing Up One or Multiple Virtual Machines, on page 77), the following options are available:

- If the HPE VM Explorer Agent is enabled and the option **Use vmkfstools to locally copy virtual disks** is selected (for more information, see Modifying a server, on page 37, the **Advanced Settings** tab), then the HPE VM Explorer Agent will request a **clone** command from *vmkfstools*.

- If the HPE VM Explorer Agent is enabled and the option **Use vmkfstools to locally copy virtual disks** is not selected, then the HPE VM Explorer Agent will perform a **local copy**.

- If the HPE VM Explorer Agent is disabled and the option **Use vmkfstools to locally copy virtual disks** is not selected, then the server will perform an **internal copy** using the web services, a process which works slower than the clone command.

Note that, while configuring a backup (for more information, see Backing Up One or Multiple Virtual Machines, on page 77), in the **Connection** tab, you can enable other direct copy options, such as compression. You cannot however use direct copy and compression while, in the **General** tab, under **Target**, **Same host as VM** is selected from the **Host** list as a target server. This is due to their restricted interface and because the transfer of the files will be performed on the internal API instead of the HPE VM Explorer Agent.

As a workaround, if you want to save space by enabling the compression options using **Same host as VM** as a target server:

1. Add the same server twice in HPE VM Explorer with different names (such as **Server A** and **Server B**) but with the same IP. For more information, see Working with Servers in HPE VM Explorer, on page 23.

2. When you schedule the task, select **Server A** as the source server and **Server B** as the target server. For more information, see Scheduling Tasks, on page 106.

3. While configuring a backup, go to the **Connection** tab and select these options:

    a. **Compress data during transfer**

    b. **Keep data compressed at destination. File Level Restore will NOT be available**.

NOTE: Enabling compression will decrease speed transfer.

Determine connection issues to VMware vSphere Web Client via browser test (ESX/ESXi)

To determine performance/connection issues and to avoid possible retries of the VMware vSphere Client, you can download a test file from your ESX/ESXi server via your Internet browser instead of retrying to retrieve one from the VMware vSphere Web Client. To do so:

1. Take a snapshot of the desired VM. For more information on taking a VM snapshot, see Viewing Virtual Machine information, on page 40.

2. Open an Internet browser and type the IP. Then, log on to VMware vSphere Web Client, click **Storage** and select the Datastore where the replicated VM is located.

3. In the *<datastore name>* screen, click **Datastore browser**.

4. In the **Datastore browser** screen, click your VM folder and locate the original file *path/to/vmname-flat.vmdk*. Then, right-click it and point to **Download** on the shortcut menu. You may need to enter your VMware vSphere Web Client credentials to confirm.

5. If the download completes successfully, move the file to a desired network drive and check that the size of the original file is equal to the size of the downloaded file. If the two downloaded files differ in size, then the issue is network-related.

Determine Hyper-V connection issues (Microsoft)

To determine whether your performance issue is related to HPE VM Explorer or to your Hyper-V environment, you can create a VSS Snapshot. To manually create VSS (Volume Shadow Copy Service), go to the Hyper-V host, open a Command Prompt window and execute the following commands:

1. Identify the root drive - the drive where Windows is installed.

2. Open the Diskshadow prompt: *> diskshadow*

3. Add the volume *<root drive>:* to the set of volumes that you want to shadow-copy:
   DISKSHADOW > add volume <root drive>:

4. Start the shadow copy creation process using the current context and option settings:
   DISKSHADOW > create

> **NOTE:** This procedure could take some time if there are several VMs running at the same time.

The output should look like:

Alias VSS_SHADOW_1 for shadow ID {715f3408-00b1-46bb-bdc4-c9050fea57f8} set as environment variable.

Alias VSS_SHADOW_SET for shadow set ID {c65c0a6c-d91a-493b-b163-6121b00b276d} set as environment variable.

Querying all shadow copies with the shadow copy set ID {c65c0a6c-d91a-493b-b163-6121b00b276d}

* Shadow copy ID = {715f3408-00b1-46bb-bdc4-c9050fea57f8} %VSS_SHADOW_1%

> **IMPORTANT:** Do NOT exit the diskshadow.

Once the VSS is created, execute the following command on a new terminal without closing the previous one. Then, create a link to VSS on our drives: *mklink /D <root drive>:\VSSLINK\ \\?\GLOBALROOT\Device\HaddiskVolumeShadowCopy2* where *\\?\GLOBALROOT\Device\HaddiskVolumeShadowCopy2* is the path to the created VSS. This command will create a symbolic link to access the VSS. Locate the file *<root drive>:\VSSLINK\hyper-v\virtual hard disks\.vhdx* and try to copy it to a test folder.

When finished, save the Windows event **System** and **Application** of the machine. To do so:

1. Go to ***Start > Run > eventvwr.exe*** to open the Windows Event Viewer and then, in the **Event Viewer** tree, expand the **Windows Logs** knot.

2. Right-click **Application** and select **Save All Events As...**

3. Right-click **System** and select **Save All Events As..**

HPE VM Explorer troubleshooting table

This section contains some of the real-life issues you may encounter when using HPE VM Explorer and the resolutions you can apply.

N o.	Issue	Environme nt	Cause	Resolution
1.	USB drive returns "disk full" error during backup, even though there is plenty of space on the disk.	Any	The disk is formatted with the FAT file system, which has a 4 GB limitation for single files.	Format the disk with the NTFS format.
2.	HPE VM Explorer cannot read Tape Media without barcodes.	Backing to Tape Media.	HPE VM Explorer cannot read Tape Media without barcodes.	Use barcode labels.
3.	NTFS Related error in Windows System Event Log.	ESX/ESXi and Microsoft issue, HPE VM Explorer 6.x.	This is a known VMware issue under investigation by VMware and Microsoft.	Contact VMware for a solution. See the VMware knowledge base article.
4.	Media erase error.	HPE VM Explorer 6.x.	Defective media.	Replace the defective media and clean the drive using a cleaning tape.
5.	Jobs do not start.	Any	Antivirus software.	Check your antivirus settings and allow access to C:/ to run

No.	Issue	Environment	Cause	Resolution
				the HPE VM Explorer installer.
6.	*QueryChangedDisk Are* errors during incremental backup/replication.	-	This issue appears when Change Block Tracking (CBT) is corrupted for a specific VM on the ESXi Server. The reasons are documented by VMware: • https://kb.vmware.com/kb/1020128 • https://kb.vmware.com/kb/2090639	See Appendix 1: QueryChangedDiskAreas errors during incremental backup/replication, below.

Appendix 1: *QueryChangedDiskAreas* errors during incremental backup/replication

Issue: Incremental backups/replications fail. Example log entry:

[3595967] Requesting Changed Disk Areas (full) for disk file: "[Datastore_Name] VM-Name/VM-Name.vmdk" Device Key: "2000" Capacity: "20971520"

[3000] 20.03.2017 22:00:42 [ERROR] QueryChangedDiskAreas error: Error caused by file /vmfs/volumes/570636cd-399b66cb-a6fe-e41f13788ae4/VM-Name/VM-Name.vmdk

[3000] 20.03.2017 22:00:42 [ERROR] QueryChangedDiskAreas: QueryChangedDiskAreas error: Error caused by file /vmfs/volumes/570636cd-399b66cb-a6fe-e41f13788ae4/VM-Name/VM-Name.vmdk

[3000] 20.03.2017 22:00:42 [3595967] QueryChangedDiskAreas Error. Data file: "VM-Name.vmdk.delta" Change ID: ""*

Background: This issue appears when Change Block Tracking (CBT) is corrupted for a specific VM on the ESX/ESXi Server. There are several reasons for this behavior, as documented by VMware:

• https://kb.vmware.com/kb/1020128

• https://kb.vmware.com/kb/2090639

Solution:

1. If the issue is caused by an issue in VMware, make sure to update ESX/ESXi to a non-affected version to prevent this issue from reoccurring.

2. Reset the CBT to clean it up:

   a. Connect to the server using VMware vSphere Client and ensure that there are no snapshots for the VM.

   b. Power off the VM, then right-click the VM and point to **Edit Settings**.

   c. Click the **Options** tab, then click **General** under the **Advanced** section and then click **Configuration Parameters**.

d. In the **Configuration Parameters** dialog box, set the *ctkEnabled* parameter to **False** for all SCSI disks. When finished, power on the VM.

3. The next incremental backup you initiate via HPE VM Explorer will enable CBT and will create a full backup of the VM. Depending on the effect of the issue, you may need to start a new backup cycle in HPE VM Explorer. To make sure the old (corrupted) backups are not mixed with the new ones while keeping the old backups as a fallback, follow this procedure:

a. Create a copy of your backups storage folder to create a fallback.

b. In HPE VM Explorer, go to *Management > Backup Explorer* and delete all the backups for the affected VM:
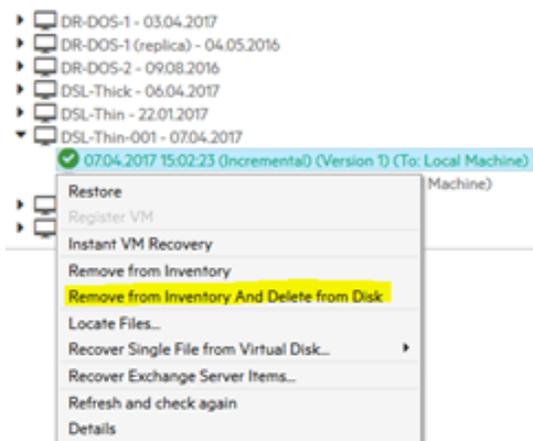
c. Make sure the backups storage folder is empty and create a backup. For more information, see Backing Up One or Multiple Virtual Machines, on page 77.

4. In case you need to make a restore, you can use the copy created during the step 3. a), as described earlier in this section. However, the operation depends on how corrupt the backup is. Go to *Management > File Explorer*, browse to the directory that contains the copy of the backup, then right-click the *vmxbackup.xml* file and point to **Restore Backup**.
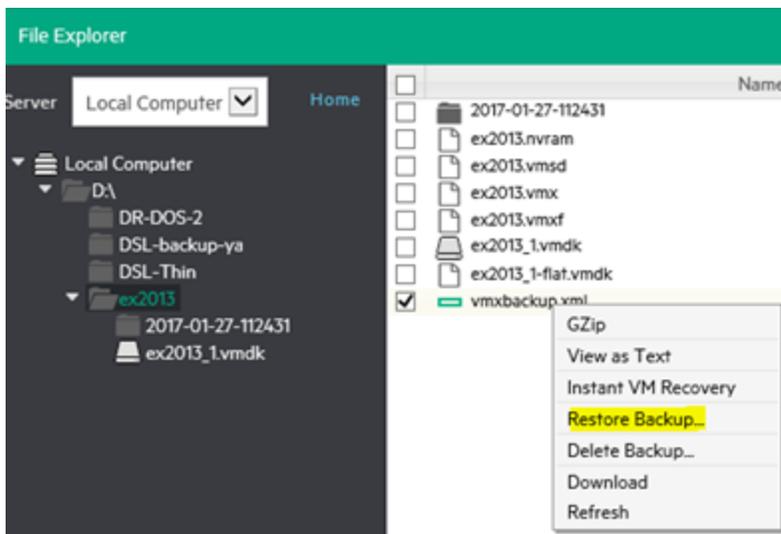
Then, use the wizard to configure the restore parameters. For more information, see Restoring a VM Backup, on page 98.

Appendix 2: Linux browsing explained

This section explains how browsing Linux volumes works based on an example of an openSUSE system with the following file system layout:

 # cat /etc/fstab

/dev/sda1 swap swap defaults 0 0

/dev/sda2 / ext3 acl,user_xattr 1 1

/dev/sdb1 /test ext3 defaults 1 2

proc /proc proc defaults 0 0

sysfs /sys sysfs noauto 0 0

debugfs /sys/kernel/debug debugfs noauto 0 0

devpts /dev/pts devpts mode=0620,gid=5 0 0

To browse Linux volumes:

1. Try to recover a single file from a virtual disk (for more information, see File level restore for single files, on page 102). Here, there are 2 VMDK files available:
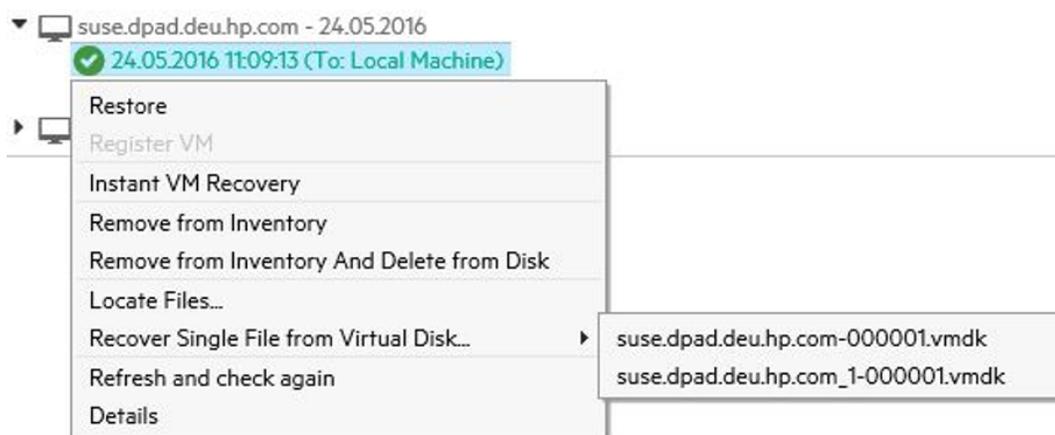
   The first one represents */dev/sda** and the second one represents */dev/sdb**.

2. When selecting, for example, the first one, a warning message is displayed:
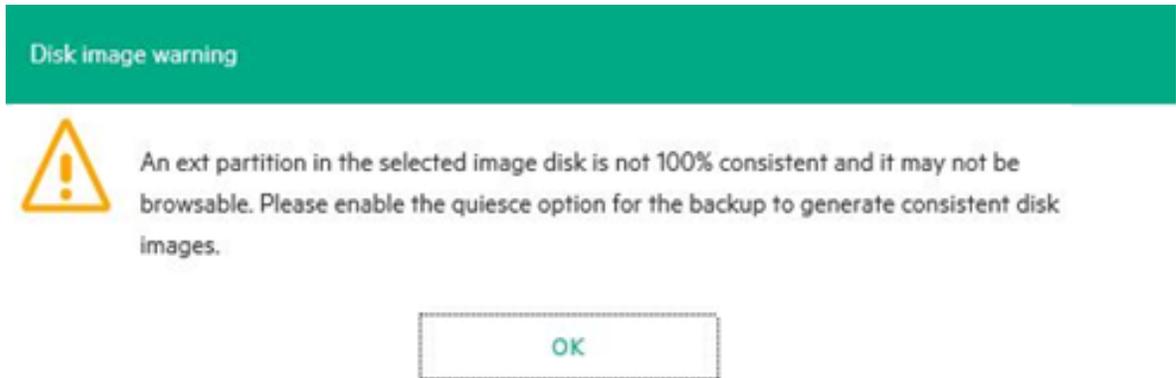
Explanation: When performing a backup of a running Linux VM, the guest OS still has a flag set on the disk, which identifies the disk as "dirty" as long as it is mounted. Since the disk is not unmounted during backup, the "dirty flag" is part of the backup. Because of this flag you get the warning, but the flag and the resulting message do not compromise the integrity of your backup and you can still recover the file without any issues.

3. In step 1, the first VMDK file has been opened (as marked by */dev/sda**). You cannot browse the first disk (that represents */dev/sda1*, highlighted in yellow below), therefore double-clicking it does not open it.
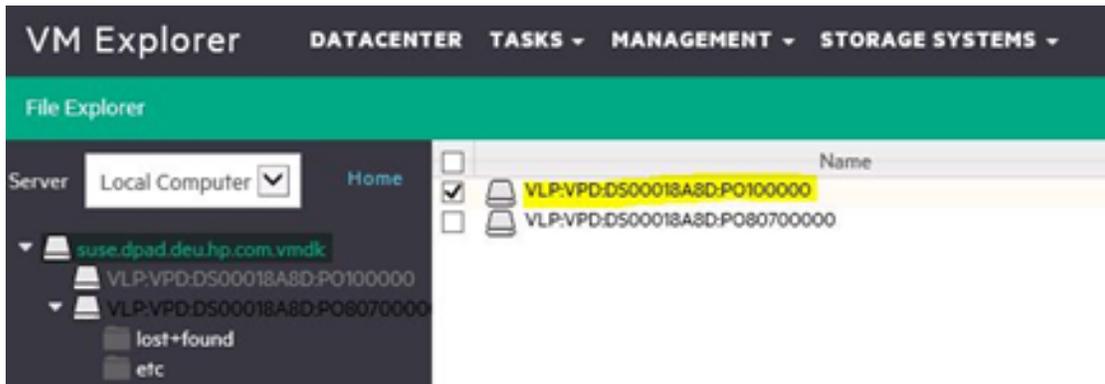
Explanation: In this case, it is a swap partition. Since it does not contain any data that you can restore, there is no need to browse it. The second disk represents */dev/sda2*, that is mounted to */*. Here you can see the directory structure of the system and also mount points for other volumes:

4. When opening mount points to other volumes, you will see that they do not contain any data. This is an expected behavior, because these mount points are just empty directories. To browse the data from a mount point, you need to browse the VMDK file that belongs to the mount point. In this example, the mount point is /test and its data resides on */dev/sdb1*. Here it is the second VMDK:

		Name
☐		
☐	🖴	VLP:VPD:DSBCF741F6:PO100000

		Name
☐		
☐	📁	lost+found
☐	📄	testfile1.txt
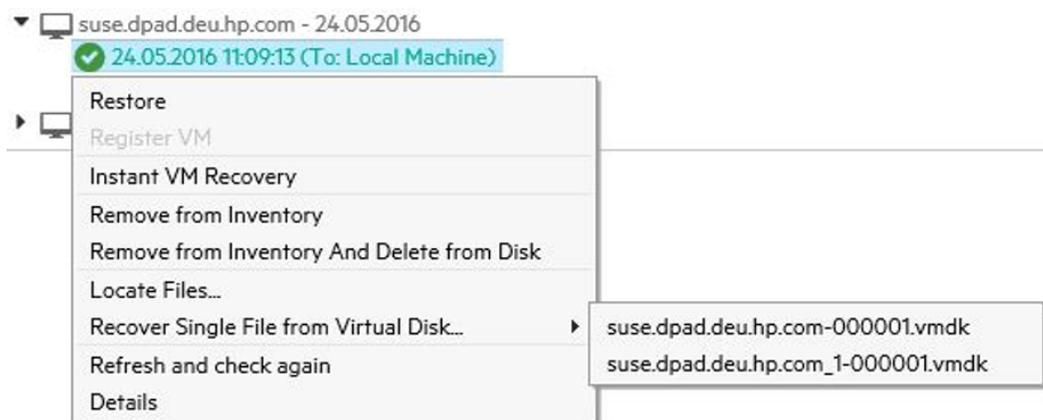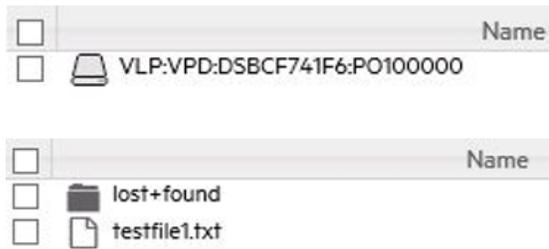
Here you can find the files from */test*.

From the original Linux System:

 # ll /test

total 20

drwx------ 2 root root 16384 May 24 10:45 lost+found

-rw-r--r-- 1 root root 4 May 24 10:53 testfile1.txt

5. File attributes are not shown (for Linux and Windows systems), but this is normal behavior.
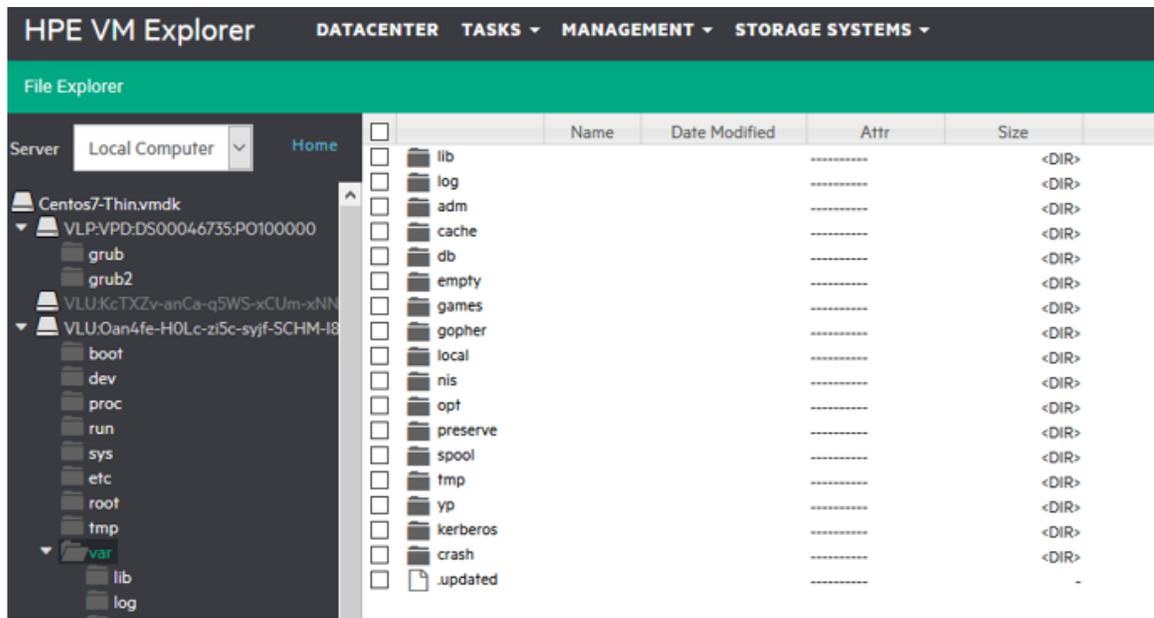
6. Files that start with a dot are renamed after you download them to a Windows system:
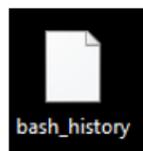
The reason is that a file without an extension, which starts with a dot, is not a valid file in Windows.

Workaround: Add an extension to the file, then add the dot and afterwards remove the extension.

Getting Support for HPE VM Explorer

To access the features that you can use in HPE VM Explorer for support purposes, click **Support** in the *<user account> -> Settings* screen. In the **Support** view, you can:

- Find the information to contact HPE Support directly
- Generate a debug report and download it
- See the path where the logs are stored. You can also open the logs in File Explorer (for more information, see Working with File Explorer, on page 115)
- Select whether you desire to log additional debug information for troubleshooting (it is recommended to use this feature only at the request of HPE VM Explorer Support team; also, this feature is disabled automatically once you log out)
- Set the log level for HPE StoreOnce Catalyst

When finished, click **Save** to preserve your settings.

> **NOTE:** The default size of the log file for HPE StoreOnce Catalyst is 10 MB and you can increase it to a maximum of 99 MB. The type of event you want to log can impact the performance of your system. For example, selecting **Error** on the **Log level** list provides the fastest logging performance, as the system will only log errors. Performance is then gradually degraded as you select additional logging levels (**Quiet**, **Info**, **Trace**, **Debug** or **Extended Debug**).

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Feedback on HPE VM Explorer User Guide (HPE VM Explorer 6.7)

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