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- Enter into discussions with other software customers
- Research and register for software training

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To register for a Passport ID, go to https://softwaresupport.softwaregrp.com/.

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Get Started

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, 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 VM Explorer. All services hereinafter are brought to you by .

For more information on which 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 VM Explorer, you need to meet the system requirements on your computer. For more information, see the VM Explorer Requirements in Support Matrix.

Installation, Upgrade and Configuration

After downloading VM Explorer, we recommend that you go to your browser’s download folder and transfer the VMExplorer-7.0.xxx.exe file to a folder of your convenience. Then:

1. Deactivate SSL 3.0 or earlier versions on the computer on which you are installing VM Explorer. See the Microsoft Knowledge Base Article dedicated to restricting the use of certain cryptographic algorithms and protocols in this respect, available here.

2. Run VMExplorer-7.0.xxx.exe. Step Result: The VM Explorer Setup wizard screen is displayed.

3. In the Welcome to the VM Explorer Setup wizard screen, click Next.

4. 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.

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

6. Click Install.

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

Starting VM Explorer

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

To start VM Explorer independently from the installation process, go to C: >Program Files (x86) > HPE >VM Explorer or double-click the VM Explorer icon on your desktop.

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

- If this is not your first 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 VM Explorer® - Starter screen. To modify your previously saved configurations, click Web Settings. For more information, see Configuring VM Explorer, on the next page.
VM Explorer Starter screen

Next, you need to log on to the application. For more information, see Running the VM Explorer web interface, on page 11.

Configuring VM Explorer

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

1. In the 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 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 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 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 **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 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 VM Explorer.

**SSL protocols status: Disabled/Enabled**
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 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 141.

**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, VM Explorer opens in your default browser. For the list of supported browsers, see Requirements, on page 6.
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 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.

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**.

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

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

<table>
<thead>
<tr>
<th>Server</th>
<th>Required Port Number</th>
<th>Observations</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESXi Servers</td>
<td>443 (HTTPS)</td>
<td>Enabling <strong>Use VM Explorer Agent</strong> on ESXi requires ports 22 (SSH), 443 (HTTPS) and 62000-65000. Using VDDK requires port 902.</td>
</tr>
<tr>
<td>vCenter</td>
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<td></td>
</tr>
<tr>
<td>Hyper-V Servers</td>
<td>9000, 9001, 62000-65000</td>
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</tr>
<tr>
<td>Linux and FreeBSD</td>
<td>22 (SSH), 2500-3000 and 62000-65000</td>
<td></td>
</tr>
</tbody>
</table>

## Running the VM Explorer web interface

After configuring VM Explorer, you need to log on using the credentials you selected during the configuration stage. For more information, see **Configuring VM Explorer**, on page 7.

To run VM Explorer, go to **Start > RUN > VM Explorer** and, in the **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 VM Explorer interface.

### Web logon

If you have not selected your language of choice yet, you can choose which localization to use in the VM Explorer language selection screen.

#### Micro Focus VM Explorer language selection

No language has been configured yet.
Please, select Micro Focus VM Explorer web interface language.

Please select your language...

Save

This option can be also changed in Settings->Language.

### Language selection (first time access)

The languages currently available to you are:

- English
- French
VM Explorer license

VM Explorer 7.0 features two types of licenses which function concurrently: the legacy license and the AutoPass license.

**NOTE:** When opening 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, VM Explorer’s features will be reduced to the Free edition capabilities until a new license is installed. To purchase an VM Explorer license, visit [https://software.microfocus.com/buy/vm-server-backup](https://software.microfocus.com/buy/vm-server-backup).

To activate your 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: **AutoPass** or **Legacy** (Trilead). The next screen varies depending on your selection at this stage.

**NOTE:** If you have an existing license with VM Explorer, there is no need for you to change
your license at this time. To get an AutoPass License, log on to the Entitlement site, at https://home.software.microfocus.com/myaccount/#/myProducts

License Activation Manager

Select License Type
Add License Key
Activation Summary

Select a licensing method:
- AutoPass
- Legacy

License Activation Manager wizard - Select License Type screen

3. In the Add License Key wizard screen:
   - For 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

License Activation Manager wizard - Add License Type for 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.
5. In the License Manager section you can see the number of sockets purchased. The following license options are available to you:

- VM Explorer Professional Starter Pack license provides 4 sockets by default.
- VM Explorer Additional Socket Pro Edition license provides a custom number of sockets.
- VM Explorer Enterprise Starter Pack license provides 6 sockets by default.
- VM Explorer Additional Socket Enterprise Edition license provides a custom number of sockets.

The socket count is computed only when the hypervisor is configured and used for a backup task. Eventhough the Hypervisor is backed up in multiple tasks, the socket count is computed only once.

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

### Setting Up Your Storage Environment in VM Explorer

You can set up a variety of storage targets in VM Explorer. For more information, see:
- Adding hypervisor servers, on the next page
- Adding storage target servers, on page 36
  - Adding an Amazon S3 storage target, on page 36
  - Adding OpenStack, HPE Helion, Rackspace and Azure cloud storage targets, on page 1
  - Adding Linux and FreeBSD servers, on page 38
- Configure the SAN Infrastructure, on page 45
- Configure tape infrastructure, on page 56

**Working with Servers in VM Explorer**

You can add a large variety of servers to the 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 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 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](image)

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 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 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 VM Explorer is running from the manufacturer’s website http://www.vmware.com/download/download.do?downloadGroup=VDDK652.
How to Enable Virtual Disk Service (VD Service)

Simply follow these 4 easy steps to enable VD Service

**Step 1:**
Download VDDK 6.5.2 from: http://www.vmware.com/download/download.do?downloadGroup=VDDK652

**Step 2:**
Select VDDK zip file: Browse

**Step 3:**
Press "Initialize VD Service" in order to link Micro Focus VM Explorer with VDDK lib

initialize VD Service

**Step 4:**
Enable "Use VD Service" on backup or replication task

VM Explorer status: VDDK successfully initialized. You can now use VD Service to back up licensed ESXi server.

How to enable Virtual Disk Service (VD Service)

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

Adding an ESXi server

You can add an ESXi server to 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 VM Explorer Datacenter.

    **NOTE:** This action only organizes the server in different folders in the VM Explorer Datacenter and will not influence backups or replication in any way.
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 (ESXi)

Specify the full DNS name or IP address of the server.

Hostname

Specify the account that will be used to connect to the server. Please note that in order to perform backups, it requires the permissions to see Virtual Machines and perform actions like Snapshots, Power On/Off, register/unregister VM, browse datastores and access through SSH.

Username root

Password

The root password is only used to elevate privileges within the SSH console. Connection to the server will be made using the configured credentials, and root password will be used only for the SU command.

Root Password

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

**NOTE:** This procedure only applies to the ESXi host. The 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 VM Explorer agent automatically.** For ESXi 5.5 (or later), you can enable SSH and use the 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 VM Explorer agent on ESXi.** 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, 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 (ESXi)**

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. 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 VM Explorer Practitioner Forum) and disable this option. In this case, the 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 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 20.

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 (ESXi)

<table>
<thead>
<tr>
<th>Name &amp; Location</th>
<th>Test Connection Result</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Connection Settings</strong></td>
<td>Running</td>
</tr>
<tr>
<td>Port Settings</td>
<td>🔄 Test ESXi Management Service</td>
</tr>
<tr>
<td>SSH / Micro Focus VM Explorer Agent</td>
<td>🔄 Check ESXi version</td>
</tr>
<tr>
<td>Advanced Settings</td>
<td>🔄 Enable SSH</td>
</tr>
<tr>
<td>Test Connection</td>
<td>🔄 Test SSH/SCP Capability</td>
</tr>
<tr>
<td>Default Folders</td>
<td>🔄 Test VM Explorer Backup Agent</td>
</tr>
<tr>
<td>Summary</td>
<td>🔄 Test VD Service (VDDK)</td>
</tr>
</tbody>
</table>

**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 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.
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 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 22.

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

In the Test Connection (Hyper-V Server) wizard screen, you can deploy the 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 VM Explorer Agent Manager from the server. The VM Explorer Agent Manager verifies if your 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 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 22.

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, 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 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 22.

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 Creating a scheduled task, on page 119.

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 Adding an ESXi server, on page 22.

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**.
Adding Linux and FreeBSD servers

The procedure for adding Linux and FreeBSD servers are similar to adding an ESXi host, except for the SSH/VM Explorer Agent and Advanced Settings, which are only used by ESXi hosts. For more information, see also Adding an ESXi server, on page 22.

Modifying a server

Depending on your needs, you can easily modify the settings of an existing server in 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 30.

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 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](image)

**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 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 VM Explorer NFS Server and if any backup test is running.

- **Test Service** mounts the 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 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.
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 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 119.
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 85.

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 56, and Delete a SAN infrastructure, on page 56.

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.
3. **Add new SAN system**

VM Explorer supports the following SAN infrastructures:

- **EMC Scale IO**—for more information, see Working with EMC ScaleIO SAN storage, below
- **HPE StoreVirtual**—for more information, see Working with HPE StoreVirtual VSA SAN systems, on page 48
- **HPE 3PAR StoreServ**—for more information, see Working with HPE 3PAR StoreServ storage, on page 50

**Working with EMC ScaleIO SAN storage**

With 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.
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 56 and Delete a SAN infrastructure, on page 56.

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 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 7.0 release of 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 56 and Delete a SAN infrastructure, on page 56.

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 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 communication with VM Explorer, make sure HPE 3PAR StoreServ WSAPI HTTPS communication is enabled.

1. 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.
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.
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 45.

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 VM Explorer you can copy your backups to tape. See Requirements, on page 6 for a full list of supported tape devices.
**Windows Device Manager**

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 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 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 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:

<table>
<thead>
<tr>
<th>Operation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Move to media pool</strong></td>
<td>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 <a href="#">About media pools, on the next page</a>.</td>
</tr>
<tr>
<td><strong>Inventory</strong></td>
<td>Prepare new media for use with VM Explorer or check if new media is already recognized.</td>
</tr>
<tr>
<td><strong>Catalog</strong></td>
<td>Makes the inventory of the tape media and scans all its contents for existing backups. VM Explorer reads the entire tape to catalog all the backups copied in it. This operation</td>
</tr>
</tbody>
</table>
can take some time.

<table>
<thead>
<tr>
<th>Import</th>
<th>If the media is in an I/E port, you can import it and VM Explorer will move the media to the first available empty slot.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Export</td>
<td>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.</td>
</tr>
<tr>
<td>Eject</td>
<td>Enables you to move media from the drive to the first available empty slot.</td>
</tr>
<tr>
<td>Erase</td>
<td>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.</td>
</tr>
<tr>
<td>Mark as Free</td>
<td>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.</td>
</tr>
<tr>
<td>Remove from catalog</td>
<td>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.</td>
</tr>
<tr>
<td>Details</td>
<td>Click to see information about the media and which VM Explorer backups are saved on it.</td>
</tr>
</tbody>
</table>

### About media pools

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

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 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](image)

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 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.
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.
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 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.
Configure Network Drives

As the 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.
9. Click Next. In the Summary tab, verify all the parameters and click Save.
Working with deduplicating storage target

With 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.
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**
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 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 85.

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 94.

Copying an HPE 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 HPE 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 VM Explorer backup copy procedures. For more information on how to copy a backup in VM Explorer, see Copy a backup, on page 98. 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 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 110.

**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 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 70.
**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**

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 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](image)
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 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 74. 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 of 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 StoreOnce Catalyst <storage target name> or <store name> screen. The system will then retrieve the entire list of existing 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.

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), 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 VM Explorer.

**NOTE:** 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 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 VM Explorer. For more information, see Configuring General settings, on page 1.

When finished, click **OK** to return to the **Exchange Server Items Recovery** wizard and then click **Next**.
4. In the **Database Selection** wizard screen, you can see the database detected by 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**.
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.
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 VM Explorer.

**Exchange Server Recovery wizard – select location**

**HPE StoreOnce Catalyst Instant VM Recovery**

With 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](image)

**Instant VM Recovery from the Backup Explorer**

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

### Removing an HPE StoreOnce Catalyst backup

You can either remove an HPE StoreOnce Catalyst backup from the VM Explorer inventory or you can remove the backup from the 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 74.

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 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 VM Explorer, on page 154.

Backing Up One or Multiple Virtual Machines

With VM Explorer you can back up one or multiple Virtual Machines.

To perform a backup in 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 92).
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.

```
Virtual Machine Backup

[Image of Virtual Machine Backup dialog box]

Backup - General

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, 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 94.

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 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.
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, 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 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, 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.

![Virtual Machine Backup](image)

**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.
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 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 VM Explorer (for more details, see Enabling VD Services for incremental backups, on page 95).

   **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.
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.
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 VM Explorer Instant Backup Test system.

**Backup - Advanced**

- **Virtual Machine Backup**
- **File System Consistency**
  - Check that the following file exists in the target VM virtual disk
    - Virtual Disk: Please select...
    - File path: Please Select...
  - Check that the file has been modified within the last 24 hours.
- **Instant Backup Test**
  - Start the newly created backup and perform a consistency check (All network adapters will be detached)
    - Take first Screenshot after a delay of 15 seconds.
    - Take second Screenshot after a delay of 30 seconds.
    - Take third Screenshot after a delay of 60 seconds.
    - Take fourth Screenshot after a delay of 120 seconds.
    - Take fifth Screenshot after a delay of 300 seconds.
    - Don't attach Screenshot images in current/daily task reports.
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. 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 131 or Sending E-mail Reports, on page 125.

To use this option, configure the VM Explorer NFS Settings. For more information, see Working with VM Explorer Settings, on page 132.

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 regular or a 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). 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
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 86. 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 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 113.

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 VM Explorer.
You must initialize the VD service.

To enable VD Service backup, you must edit your server settings (Expert Settings tab) in the VM Explorer Server view. For more information, see Working with Servers in VM Explorer, on page 18.

For ESXi free edition, you do not need VDDK, but you must enable the VM Explorer agent on the ESXi server by selecting the Try to use the VM Explorer agent on ESXi (...) checkbox in the SSH / VM Explorer Agent screen of the Add or Edit Server (ESXi) wizard. For more information, see Working with Servers in VM Explorer, on page 18.

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. VM Explorer initially creates a full backup of your VM and then will create incremental backups, which contain only the changed data.

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, VM Explorer needs to be initialized to use the Virtual Disk Service Library (VD Service) and you must enable the VD Service in 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 22). 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 20. For more information on modifying servers, see Modifying a server, on page 38.

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

Backup encryption

With 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 VM Explorer.
To encrypt your backups, during the backup configuration process (for more information, see Backing Up One or Multiple Virtual Machines, on page 85), 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**
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. **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)

a. 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**.
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.
Replicating One or More Virtual Machines

With 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 109.

**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):
<table>
<thead>
<tr>
<th>Hypervisors</th>
<th>ESXi free target</th>
<th>ESXi licensed target</th>
</tr>
</thead>
<tbody>
<tr>
<td>ESXi free source</td>
<td>√</td>
<td>√</td>
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<tr>
<td>ESXi licensed source</td>
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<tr>
<th>Hypervisors</th>
<th>Hyper-V 2008 R2/2012/2012 R2</th>
<th>Hyper-V 2016 with Microsoft CBT</th>
<th>Hyper-V 2016 with VM Explorer Agent</th>
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<tr>
<td>Hyper-V 2016 with VM Explorer Agent</td>
<td>√</td>
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</table>

**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

Simply follow these 4 easy steps to enable VD Service

Step 1:
Download VDK 6.5.2 from:

Step 2:
Select VDK zip file: [Browse]

Step 3:
Press "Initialize VD Service" in order to link Micro Focus VM Explorer with VDK lib

VM Explorer status: VDK successfully initialized.
You can now use VD Service to back up licensed ESXi server.

Step 4:
Enable "Use VD Service" on backup or replication task

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 86.

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 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.

![Virtual Machine Replication](image)

**Replication - Replication tab**

6. For information on how to configure the **Advanced** tab, see *Backing up a single VM*, on page 86.

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.
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 86.
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 103. 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 103.

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 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.
Restoring a VM Backup

In 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 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:

<table>
<thead>
<tr>
<th>Hypervisors</th>
<th>ESXi free target</th>
<th>ESXi licensed target</th>
</tr>
</thead>
<tbody>
<tr>
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<td>√</td>
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</tr>
</tbody>
</table>
To restore a backup in 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.

   **Virtual Machine Restore**

   - **Host**: HyperV 1034.517
   - **Directory**: C:\LinuxMint-Restored

   - **Backup date**: Version 0 - 01.02.2018 05:00

   - **Registration Settings**
     - **Register using the following display name**: LinuxMint-Restored
     - **Power on VM after registration**

   - **OK**

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, 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 103.
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 **Restoring a VM Backup, on page 110**.
**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, VM Explorer prompts you to enter the password in order to proceed with the operation.
Recovering Single Items

With 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

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

An ext partition in the selected image disk is not 100% consistent and it may not be browsable. Please enable the quiesce option for the backup to generate consistent disk images.

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 VM Explorer.

**NOTE:** 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 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 VM Explorer. For more information, see Configuring General settings, on page 132.

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 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 VM Explorer.

Scheduling Tasks

With 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 85
   - Replication—for more information, see Replicating One or More Virtual Machines, on page 103
   - Copy backup—for more information, see Copy a backup, on page 98
   - E-mail report—for more information, see Sending E-mail Reports, on page 125
   - Custom script—for more information, see Custom script, on page 125

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 VM Explorer by clicking Enable the Scheduler in the Scheduler View.

   **IMPORTANT:** VM Explorer executes scheduled tasks using its own Windows Service that executes scheduled tasks. When using the VM Explorer service you do not need to be logged on and have 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.

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 85) or replication (for more information, see Replicating One or More Virtual Machines, on page 103) 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

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 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](image)

Sending E-mail Reports

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 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 135. When finished, click Next.

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.
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.
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.
Types of reports

The following report types are available in 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...

How to use the filtering feature in VM Explorer

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 VM Explorer Settings

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

Configuring General settings

To configure some of 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, 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](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 119.

**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 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](image)

**Managing network drives**

In 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**, on the previous page.

**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 125.

## Instant Recovery Service

To be able to use VM Explorer NFS, make sure no other NFS server is running on the machine where 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 VM Explorer NFS. To do so, in the **Settings** view, go to **Instant Recovery Service**. Here, you can start or stop the VM Explorer NFS server.

If the **Enable VM Explorer NFS server** dialog box is selected/cleared, VM Explorer NFS Server will automatically start/stop when closing this dialog. Selecting the **Open Windows Firewall** checkbox will automatically open Windows Firewall for 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.
To add an Active Directory entry, click Add and fill in the Domain Name and the Domain Controller (IP or computer name).

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

In the Users settings you can add, modify and delete VM Explorer users and their access permissions. You can see the current users included in 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 VM Explorer, and the password is encrypted.
Settings - Add Active Directory Users

You can also add existing users from the Active Directories added to VM Explorer (for more information, see Configuring the Active Directory, on page 137) 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 (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 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.
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 VM Explorer

This section contains information on how to troubleshoot VM Explorer. We recommend that you become familiar with the procedures herein before escalating any issue you might have to VM Explorer Support. For more information, see Getting Support for VM Explorer, on page 154.

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 VM Explorer. Also, given the large variety of environments into which you can run VM Explorer, we recommend that you monitor yours to establish the optimal performance level.

- Enable the VM Explorer Agent when adding an ESX/ESXi server to VM Explorer, for faster backups/restores and more secure connections. The 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 VM Explorer Agent during the process of adding an ESXi server. For more information, see Adding an ESXi server, on page 22.
- 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, 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 85 or Replicating One or More Virtual Machines, on page 103.
- For better performance, when adding a VM with 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, VM Explorer needs to read the entire disk again to perform some calculations for optimal performance.
- VM Explorer performs tasks sequentially and supports multiple tasks running at the same time, which can help to reduce backup windows. For simultaneous backups, 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 VM Explorer transfers data.

**How VM Explorer transfers data**

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

- When performing a full/incremental backup on the local computer where 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 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 20 - 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 VM Explorer is installed and then from the local machine to the target server.
- When performing a backup between ESX/ESXi with the VM Explorer Agent enabled, the data runs from host to host using the 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 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 146.

**IMPORTANT:** The SSH (Secure Shell) File Transfer Protocol provides file access, file transfer and file management functionalities over any reliable data stream. VM Explorer supports
backup without SSH but we strongly recommend to use the 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 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 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 *Backing Up One or Multiple Virtual Machines*, on page 85.

**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 VM Explorer, disable the Task Scheduler and check that no backup is running at the moment. For more information on the Task Scheduler, see *Scheduling Tasks*, on page 119.

2. Next, connect to the source server and create a snapshot of the VM in question. For more information, see *Determine backup/restore performance of hypervisor servers*, on the previous 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/datastoreName/tempFile.tmp" 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 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 85), the following options are available:

- If the 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 38, the Advanced Settings tab), then the VM Explorer Agent will request a clone command from vmkfstools.
- If the VM Explorer Agent is enabled and the option Use vmkfstools to locally copy virtual disks is not selected, then the VM Explorer Agent will perform a local copy.
- If the 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 85), 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 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 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 VM Explorer, on page 18.
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 119.
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 41.
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 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\%VSS\%

\%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\<datastore name>\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..
# VM Explorer troubleshooting table

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

<table>
<thead>
<tr>
<th>No.</th>
<th>Issue</th>
<th>Environment</th>
<th>Cause</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>USB drive returns &quot;disk full&quot; error during backup, even though there is plenty of space on the disk.</td>
<td>Any</td>
<td>The disk is formatted with the FAT file system, which has a 4 GB limitation for single files.</td>
<td>Format the disk with the NTFS format.</td>
</tr>
<tr>
<td>2.</td>
<td>VM Explorer cannot read Tape Media without barcodes.</td>
<td>Backing to Tape Media.</td>
<td>VM Explorer cannot read Tape Media without barcodes.</td>
<td>Use barcode labels.</td>
</tr>
<tr>
<td>3.</td>
<td>NTFS Related error in Windows System Event Log.</td>
<td>ESX/ESXi and Microsoft issue, VM Explorer 6.x.</td>
<td>This is a known VMware issue under investigation by VMware and Microsoft.</td>
<td>Contact VMware for a solution. See the VMware knowledge base article.</td>
</tr>
<tr>
<td>5.</td>
<td>Jobs do not start.</td>
<td>Any</td>
<td>Antivirus software.</td>
<td>Check your antivirus settings and allow access to C:/ to run the VM Explorer installer.</td>
</tr>
<tr>
<td>6.</td>
<td>QueryChangedDiskArAre errors during incremental backup/replication.</td>
<td>-</td>
<td>This issue appears when Change Block Tracking (CBT) is corrupted for a specific VM on the ESXi Server. The reasons are documented by VMware:</td>
<td>See Appendix 1: QueryChangedDiskArAre errors during incremental backup/replication, on the next page.</td>
</tr>
</tbody>
</table>
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 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 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 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 85.

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 110.

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 115). 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:
Here you can find the files from /test.

From the original Linux System:

```
# ls /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 VM Explorer

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

- Find the information to contact 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 130)
- Select whether you desire to log additional debug information for troubleshooting (it is recommended to use this feature only at the request of 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).
Send documentation feedback

If you have comments about this document, you can contact the documentation team by email. If an email client is configured on this system, click the link above and an email window opens with the following information in the subject line:

Feedback on User Guide (Micro Focus VM Explorer 7.0)

Add your feedback to the email and click Send.

If no email client is available, copy the information above to a new message in a web mail client, and send your feedback to docs.feedback@microfocus.com.

We appreciate your feedback!