5NINE SOFTWARE

#1 Management and Security for Windows Server and Hyper-V

Getting Started Guide

5nine Manager for Hyper-V

Version 4.0

January 2014

Microsoft Partner Network

Windows Server 2012 Certified

Windows Server 2012 R2 Certified

Table of Contents

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Security & Management Solutions for Hyper-V and Windows Server

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We always welcome your feedback on the product and your user experience. Please send comments and suggestions to info@5nine.com.

Customer Support

If you have encountered any issue using 5nine Manager for Hyper-V, please contact techsupport@5nine.com. Please supply product log files with your query to the support team.

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Summary

5nine Manager for Hyper-V is a virtual infrastructure management tool, joining standard Hyper-V manager functions and virtual network management tools. 5nine Manager for Hyper-V provides an easy-to-use graphical interface for all editions of Hyper-V. It installs easily on the full and core versions of Windows Server 2008 R2 SP1, Windows Server 2012/2012 R2, and Hyper-V Server 2012/2008 R2 SP1. 5nine Manager for Hyper-V is the only Hyper-V management tool that installs directly on a Windows Server Core or a Free Hyper-V Server.

5nine Manager for Hyper-V has its own file manager with the ability to copy files between VMs, and between a VM and host. The ease of transfer allows easy operating on OS without GUI and file explorer. This feature is an added value compared to the standard MS Hyper-V manager, which will not allow these operations.

5nine Manager for Hyper-V performs ALL aspects of Hyper-V Management, including:

- Removing and editing virtual machines, virtual networks, and virtual disks.
- Supporting Generation 2 virtual machines creation (applies for hosts with Windows Server 2012 R2).
- Viewing resource allocation and utilization of virtual machines.
- Full virtual machine snapshot management.

Additionally, 5nine Manager for Hyper-V performs the following features that are absent in the standard MS Hyper-V management tool:

- Own graphical user-friendly interface – file manager with built-in transfer virtual hard drive with a capacity up to 127 Gb for exploring files and network shares, even on Windows Core and Free Hyper-V.
- Quality of Service management – setting of minimum and maximum Input Output operations per second (IOPS) throttling for the virtual hard disk attached to a virtual machine (applies for hosts with Windows Server 2012 R2)
- System Status Report presented in the intuitive graphical form. Available in the full version of 5nine Manager for Hyper-V.
- Failover cluster manager function, such as VM migration between nodes. Available in the full version of 5nine Manager for Hyper-V.

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System requirements

Local and remote management:

- Windows Server
  - Windows Server 2012 R2
  - Windows Server 2012 R2 Core
  - Windows Server 2012
  - Windows Server 2012 Core
  - Windows Server 2008 R2 SP1
  - Windows Server 2008 R2 SP1 Core

- Microsoft Hyper-V Server
  - Microsoft Hyper-V Server 2012 R2
  - Microsoft Hyper-V Server 2012
  - Microsoft Hyper-V Server 2008 R2 SP1
  - Windows 8.1 with Hyper-V role enabled
  - Windows 8 with Hyper-V role enabled

Remote management only (allows management of different versions of Hyper-V hosts from one Windows Client):

- Windows
  - Windows 8.1 x64
  - Windows 8 x64
  - Windows 7 x64

Prerequisites

- .NET Framework 4.5 or higher

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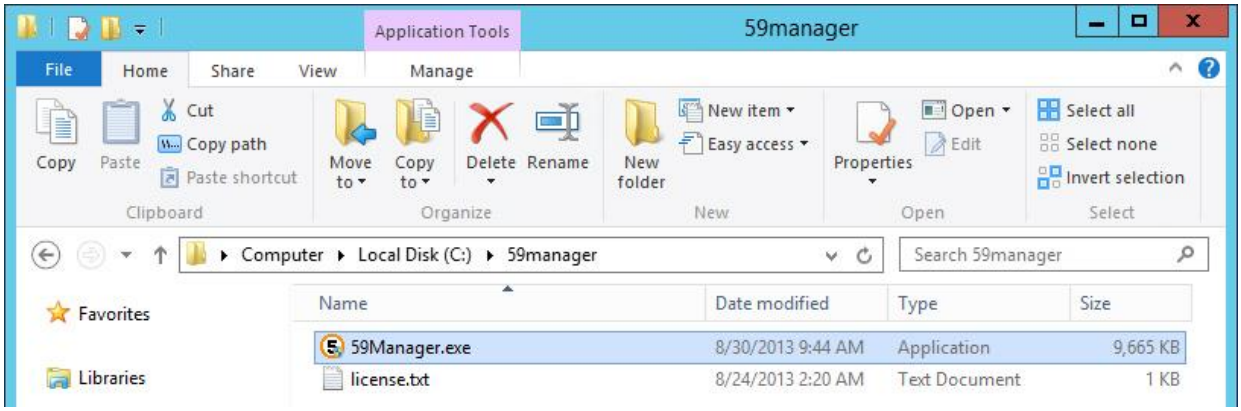
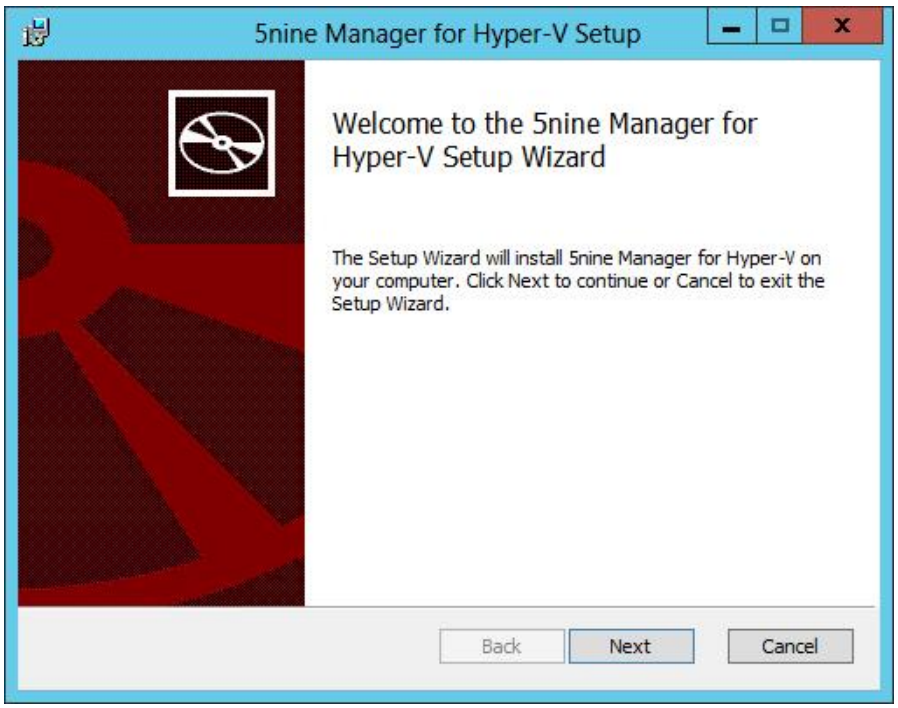
Installation

To install 5nine Manager for Hyper-V, run the 59Manager.exe application from the downloaded 5nine Manager for Hyper-V archive:



The welcome wizard will appear:



Click Next. The *5nine Software End User License Agreement* will appear. Accept it and click Next.

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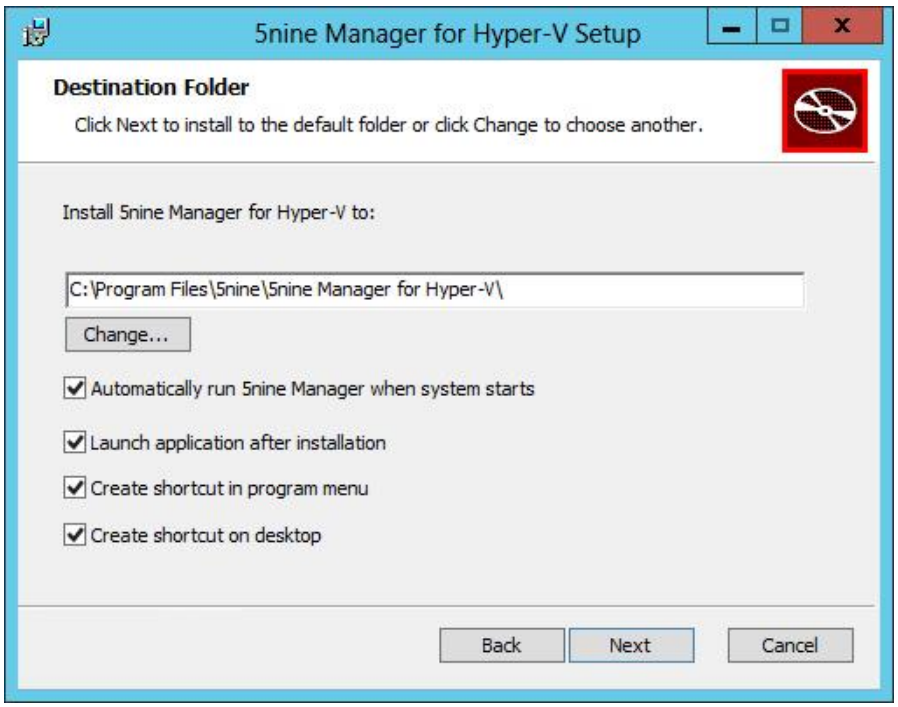
Select the folder for 5nine Manager for Hyper-V:



Set the following program behavior options (select or deselect depending on your preferences):

- Automatically run 5nine Manager when system starts;
- Launch application after installation;
- Create shortcut in program menu;
- Create shortcut on desktop.

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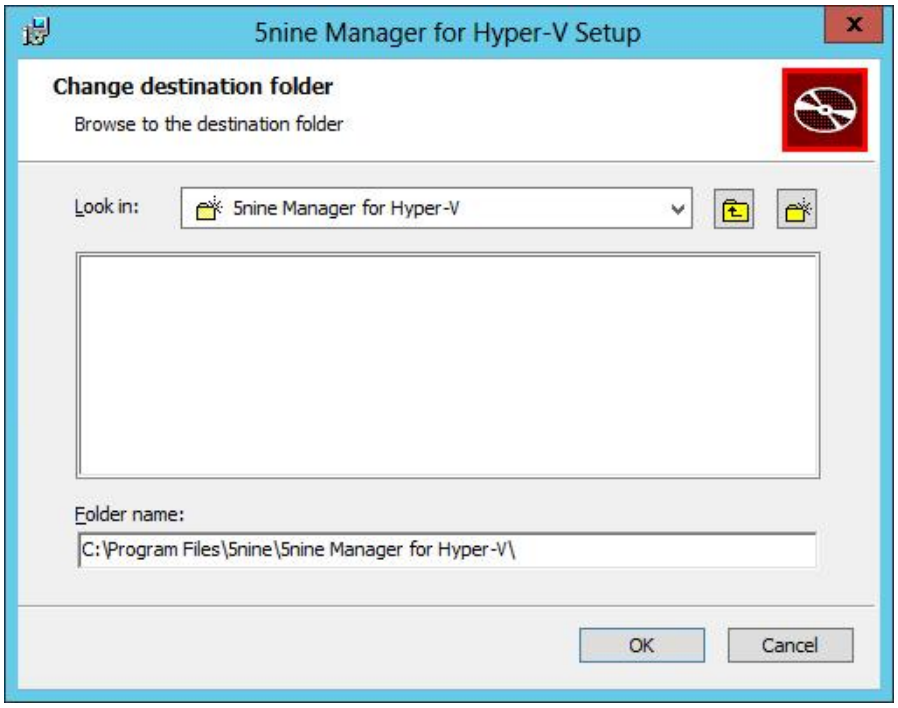
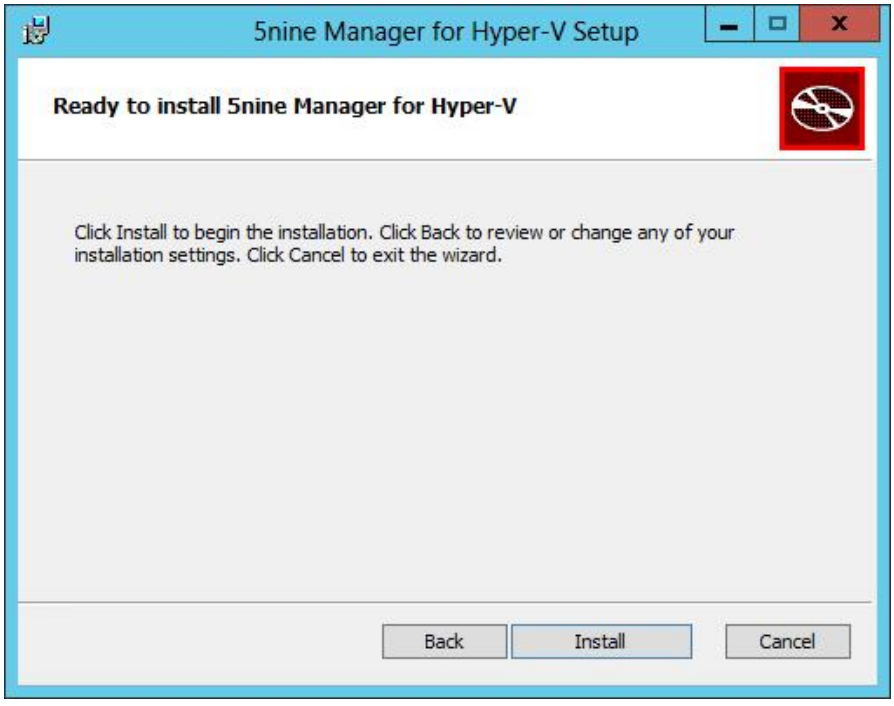
Choose the default folder or select where you want 5nine Manager for Hyper-V to be installed on your server:



Confirm installation:



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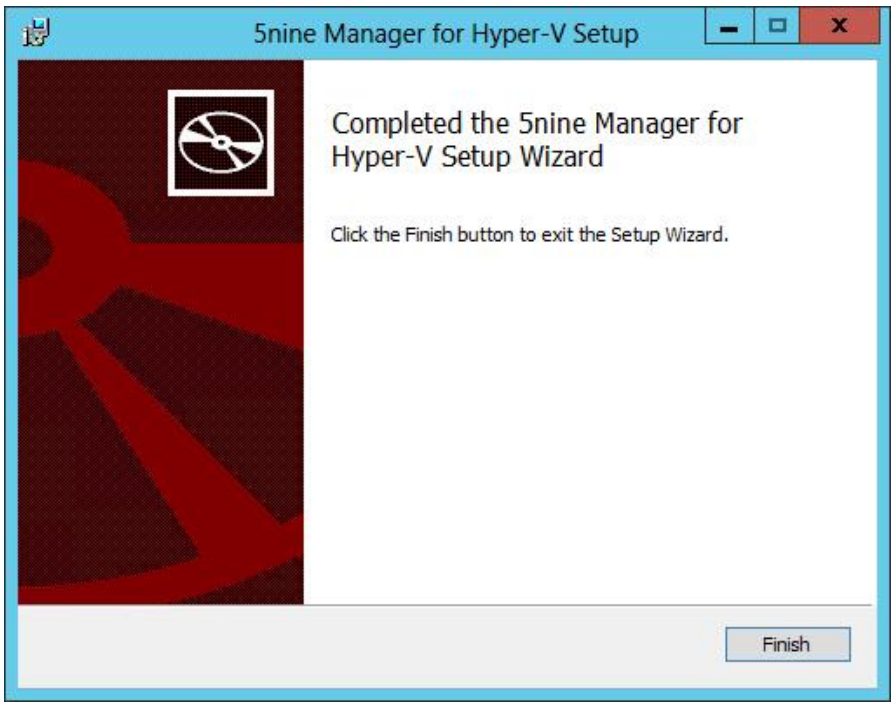
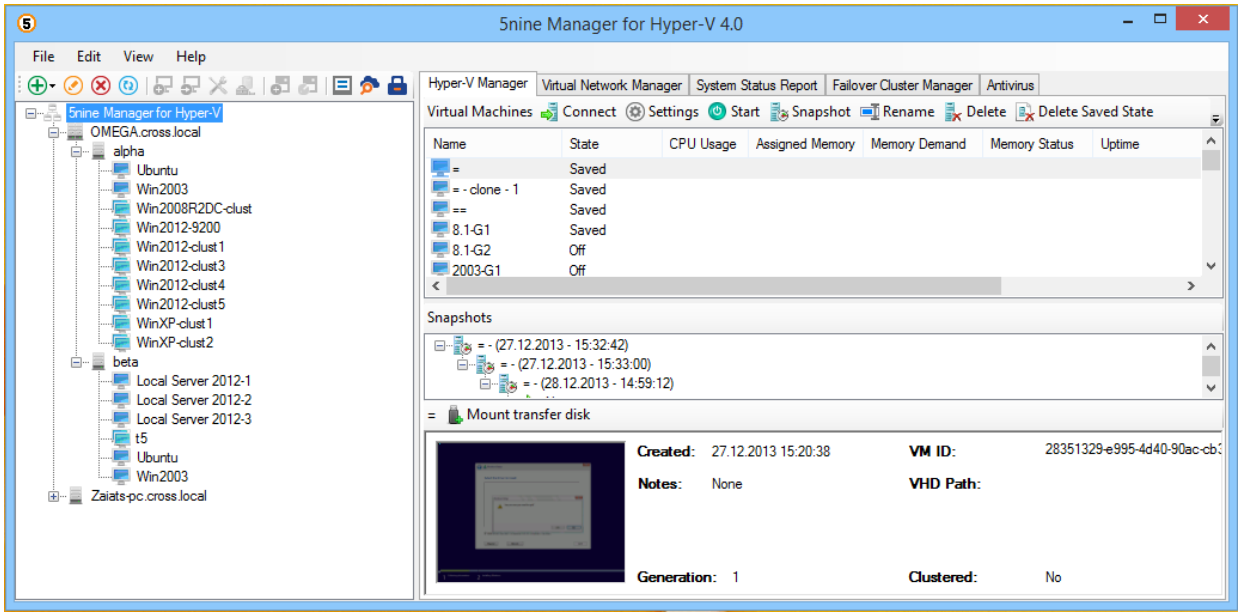
When installation is complete, click Finish:



The installation is complete.

After installation, 5nine Manager for Hyper-V is ready to work. Start running 5nine Manager for Hyper-V using your created shortcuts.



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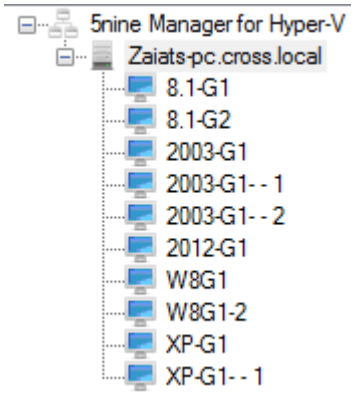
Customizing object tree

After installation, all VMs based on the local host will be added to the object tree under the *5nine Manager for Hyper-V* datacenter, created by default.



Additional objects can be added to the object tree, as described below.

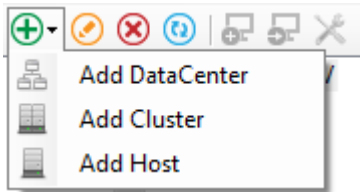
Object types

The following objects are presented from the 5nine Manager for Hyper-V point of view:

- DataCenter. This object needs to be added before any other objects. DataCenter is a formal aggregating entity that is used for the purpose of joining the other objects as its subsidiaries.
- Cluster. The cluster object represents multiple servers (nodes) joined in a cluster. It shows all VMs hosted on the cluster nodes. Locally created VMs on the nodes are not shown here.
- Host. Host object represents a single server and shows all VMs on it.

Adding objects to the tree

To add a new object to 5nine Manager for Hyper-V tree, use the main panel menu commands (or **Edit** → **Add Object** menu commands):



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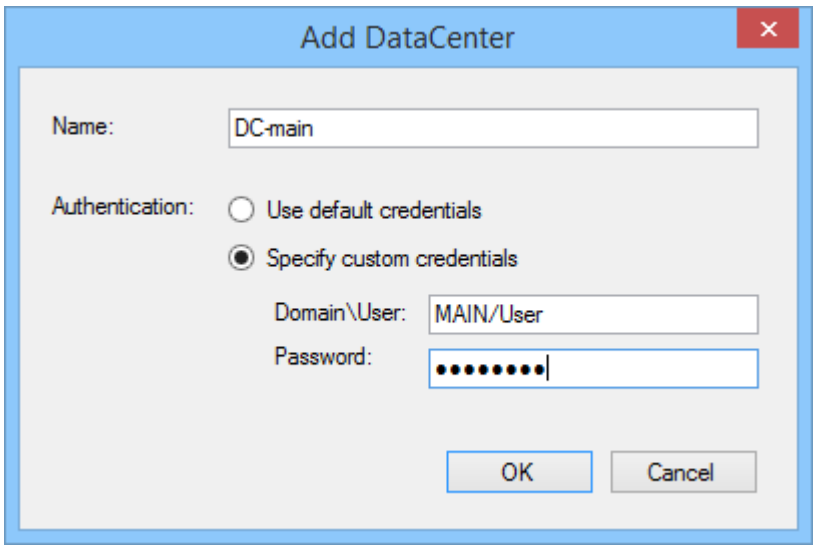
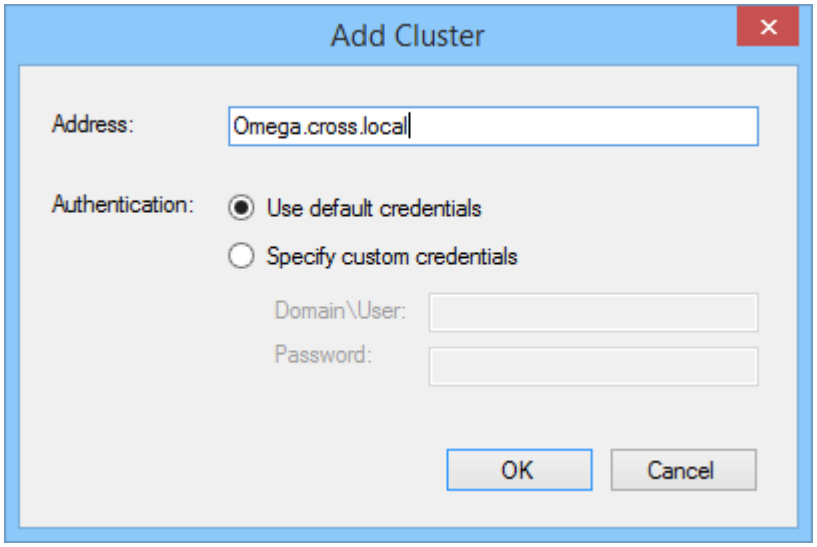
Use **Add DataCenter** menu command to add the new data center to the object tree:



Enter the following parameters:

- The name of new data center;
- Authentication type – either use default credentials or specify them manually.

Staying on the DataCenter, use the **Add Cluster** and/or **Add Host** menu commands to add the new cluster or host to the object tree accordingly:



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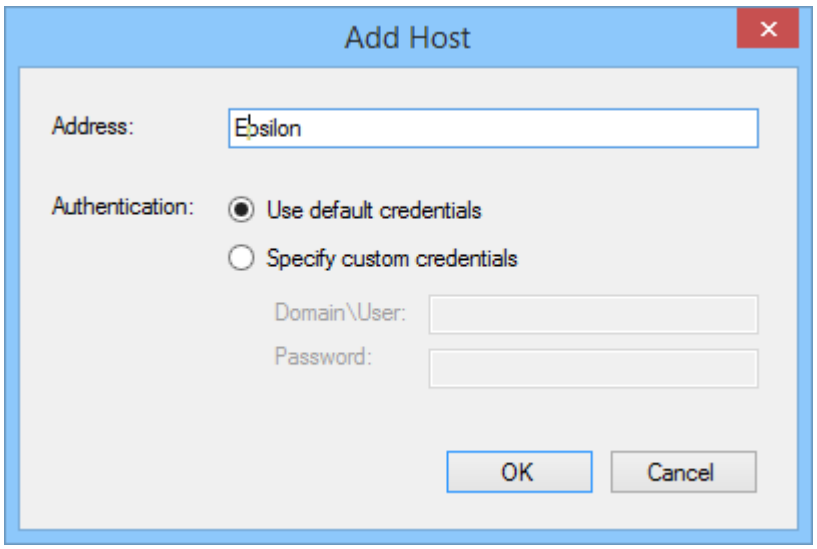
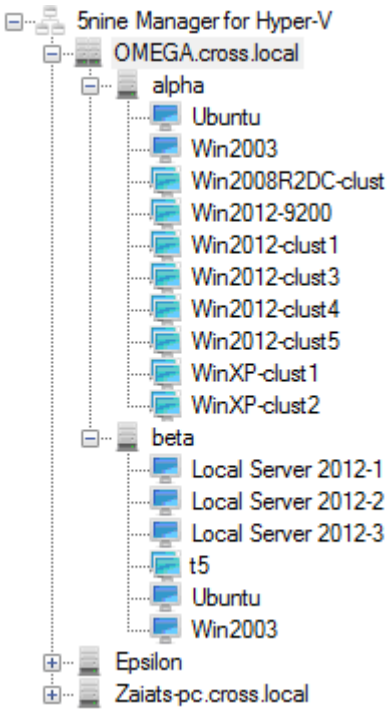


Enter the parameters for new cluster and host just like it is done for data center.

The new added objects will appear in the tree on the left:



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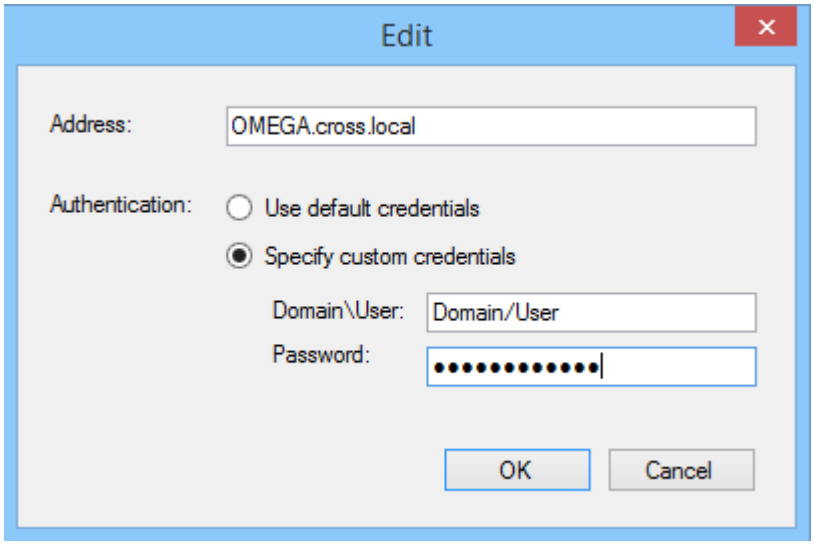
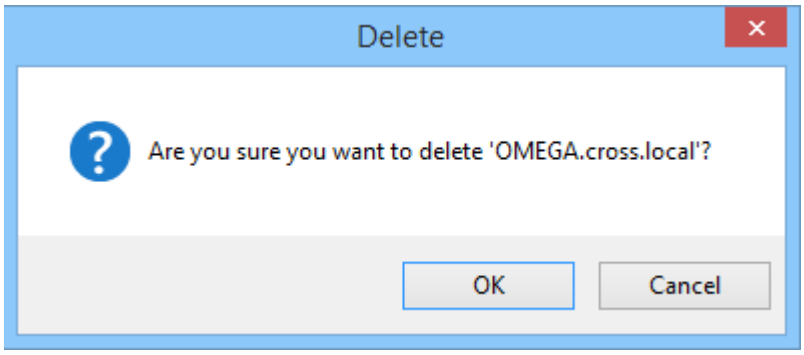
Editing objects

To edit any object in the 5nine Manager for Hyper-V tree, select the necessary object and click the (**Edit**) button on the main panel menu or use **Edit** → **Edit Object** menu command. Then enter the new parameters for selected object in the following dialog and click **OK**:



Removing objects

To remove any object from the 5nine Manager for Hyper-V tree, select the necessary object and click the (**Delete**) button on the main panel menu or use **Edit** → **Remove Object** menu command. Then click **OK**:



Attention! Removing the grouping entity (DataCenter) automatically removes all its subsidiaries.

Refreshing object tree

To refresh the object tree or change its view use the **View** menu commands:

- **View** → **Tree View** to get the spanning tree object view;
- **View** → **List View** to get the list object view;
- **View** → **Refresh** (or button on the main panel menu) to refresh the object tree.

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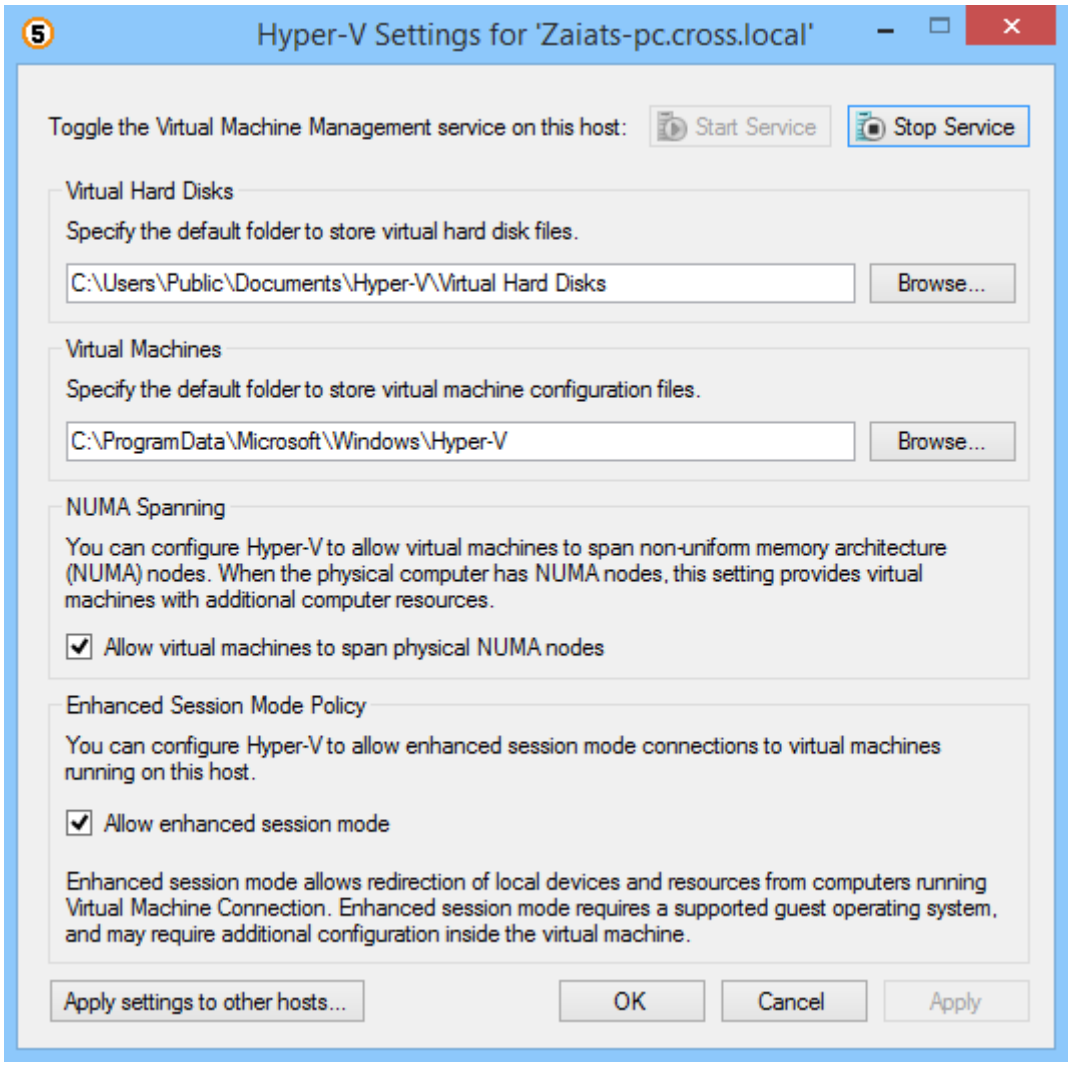
Hyper-V Settings

To change Hyper-V Settings for a host, select a host in the tree and press the (**Hyper-V Settings**).



Use the **Stop Service** button to stop all VMs on a selected host. You can start them again by pushing the **Start Service** button.

You can change folders for information storage:

- Default folder to store virtual disk files.
- Default folder to store virtual machine configuration files.

And set the following options:

- Allow virtual machines to span physical NUMA nodes.
- Allow enhanced session mode.

The **Apply settings to other hosts** button allows to apply settings to other hosts.

To apply setting, select hosts and press **Apply**.

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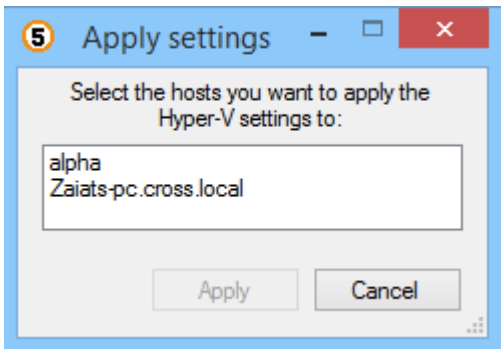

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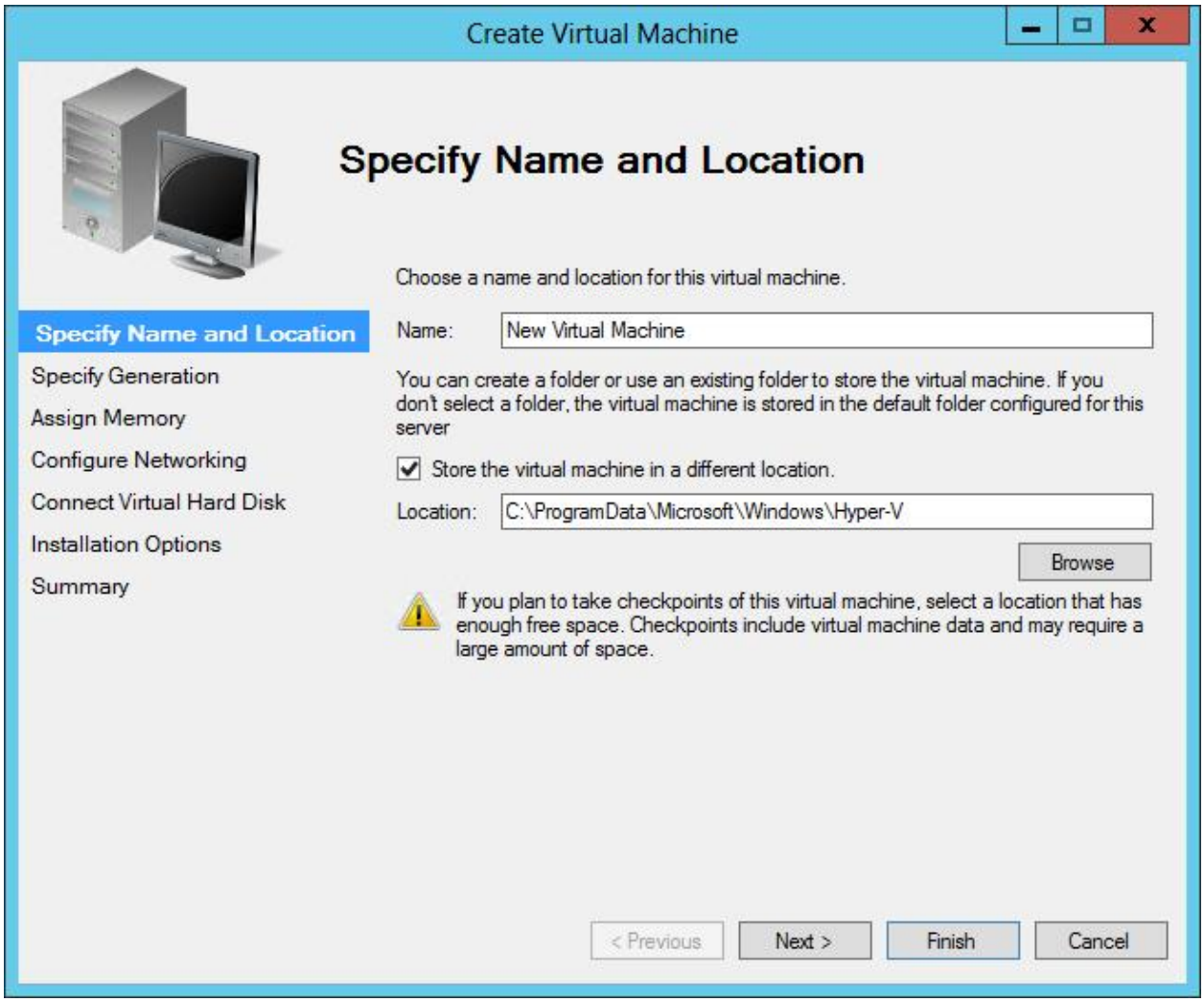
Creating a new virtual machine

To create a new virtual machine (VM), first you need to select the host on which the VM will be seated. Select either of the two ways to create a new VM:

1. Select the host within the cluster sub-tree so that the new VM is created as a clustered VM; Or
2. Select the host as a separate entity in the 5nine Manager for Hyper-V tree so that the new VM is created as a local VM.

Click the (**Create New VM**) button on the main panel menu or **Edit** → **Create New VM** menu command. The **Create Virtual Machine** wizard will be opened:



Enter the VM name (NOTE: "New Virtual Machine" is the default name) and select the location to store the new VM configuration file. The default location is %ProgramData%\Microsoft\Windows\Hyper-V for a locally created VM. Click **Next**.

Note. If you click **Finish** at this or in any of the following steps, the new VM will be created with the default parameters that you haven't altered during creation process.

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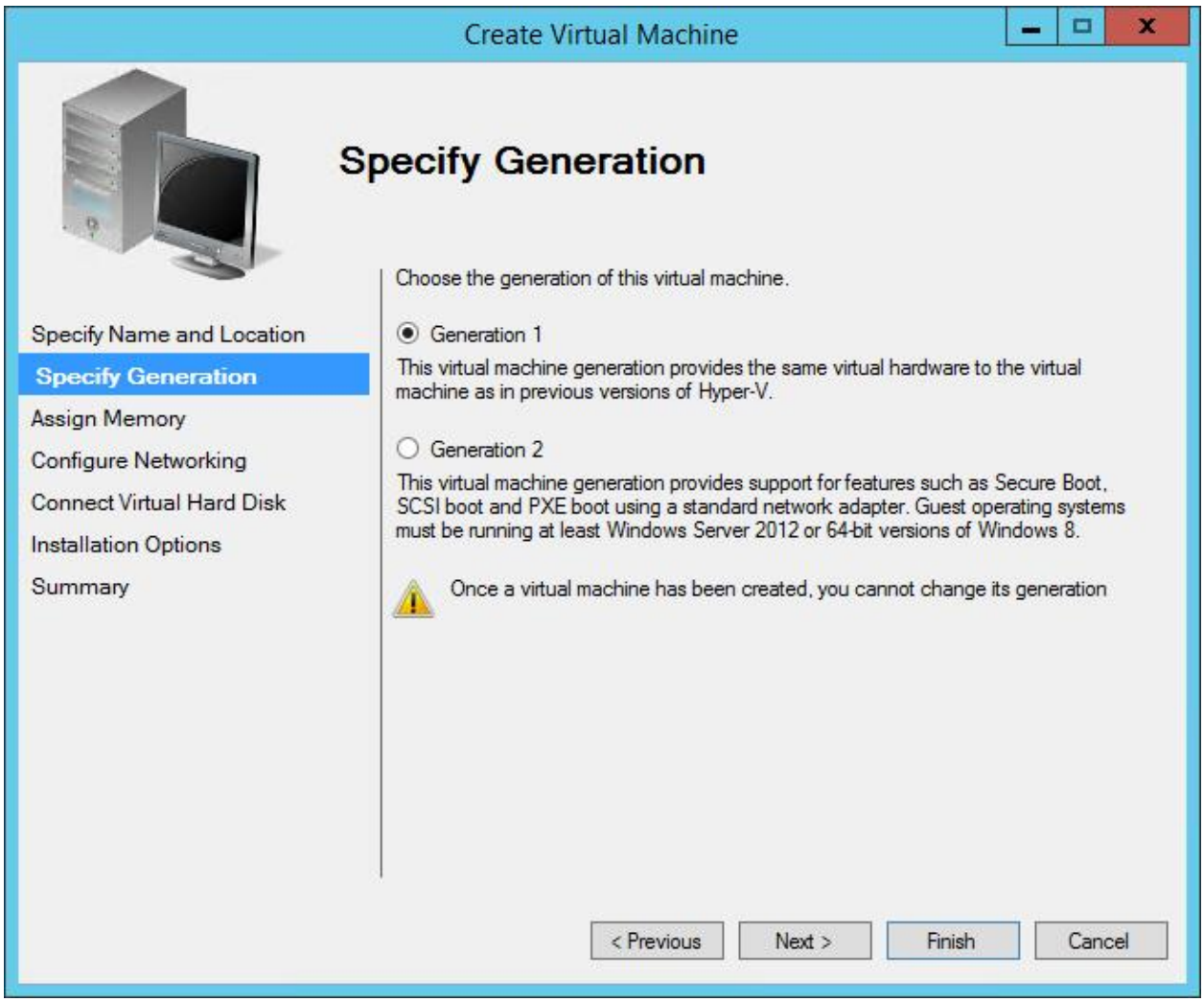

Specify generation of the new VM:

- "Generation 1" – to create the VM with the older virtual hardware, as in earlier versions of Hyper-V;
- "Generation 2'" – to create the VM with support of newer features, such as Secure Boot, SCSI boot and PXE boot.

Note. The option "Generation 2" is available only on the hosts running Windows Server 2012 R2. For others, it is disabled and only "Generation 1" option is available.

Click **Next**.

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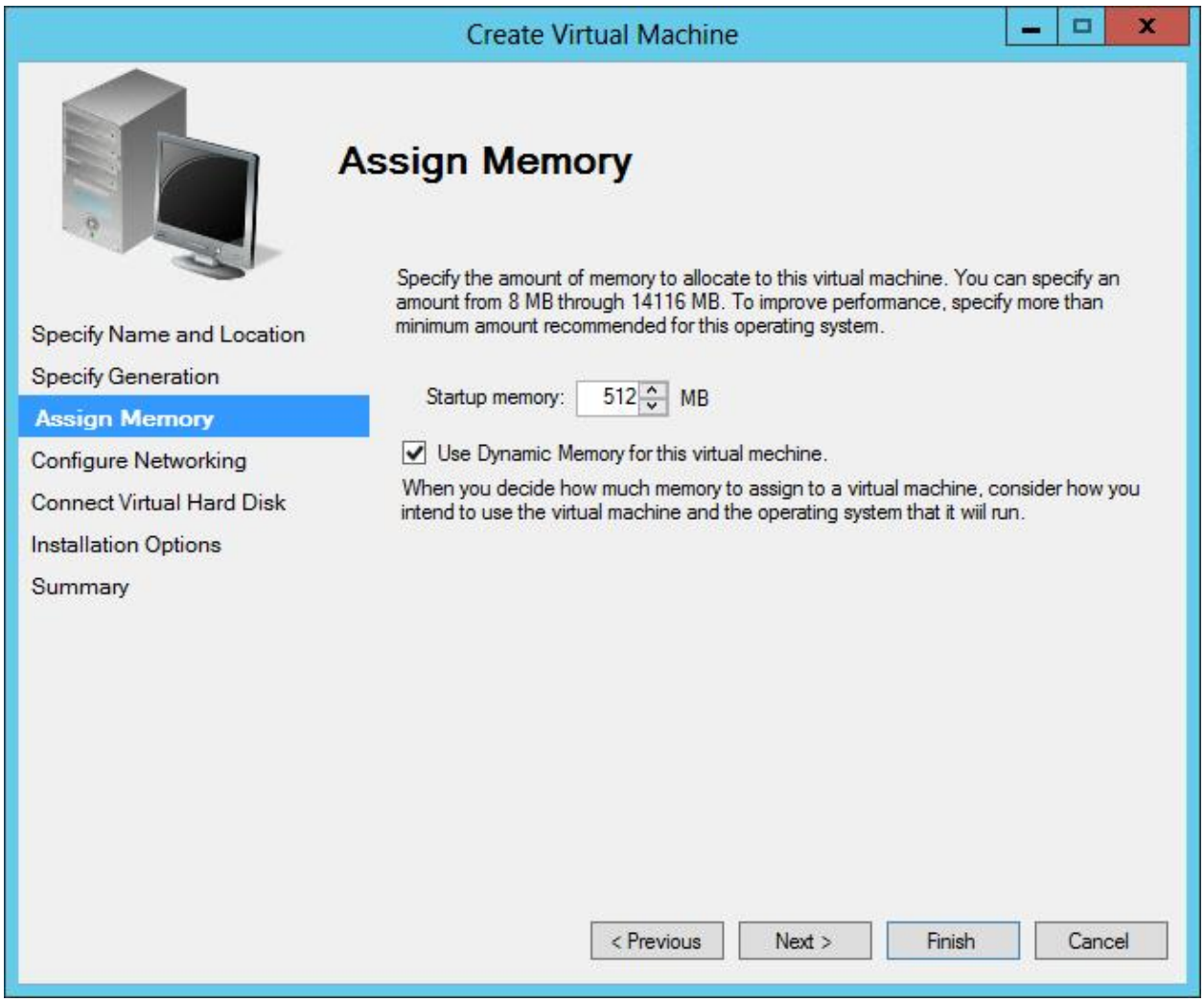

Assign memory for the new VM:

- Enter the necessary amount of memory in MB in the **Startup memory** field. The default value is 512 MB. You can use arrows to the right of the field to alter this figure within the min/max range, from 8 to 14116 MB. Consider the OS memory requirements that will be used on the VM.

Note. Please enter memory in increments 2MB

- Set the memory allocation mode. Memory can be allocated either statically or dynamically in accordance with needs and host physical resources availability. Tick the **Use Dynamic Memory for this virtual machine** box to set the dynamic memory allocation for the VM. If the box is not ticked (default setting), the static memory applies to VM.

Click **Next**.

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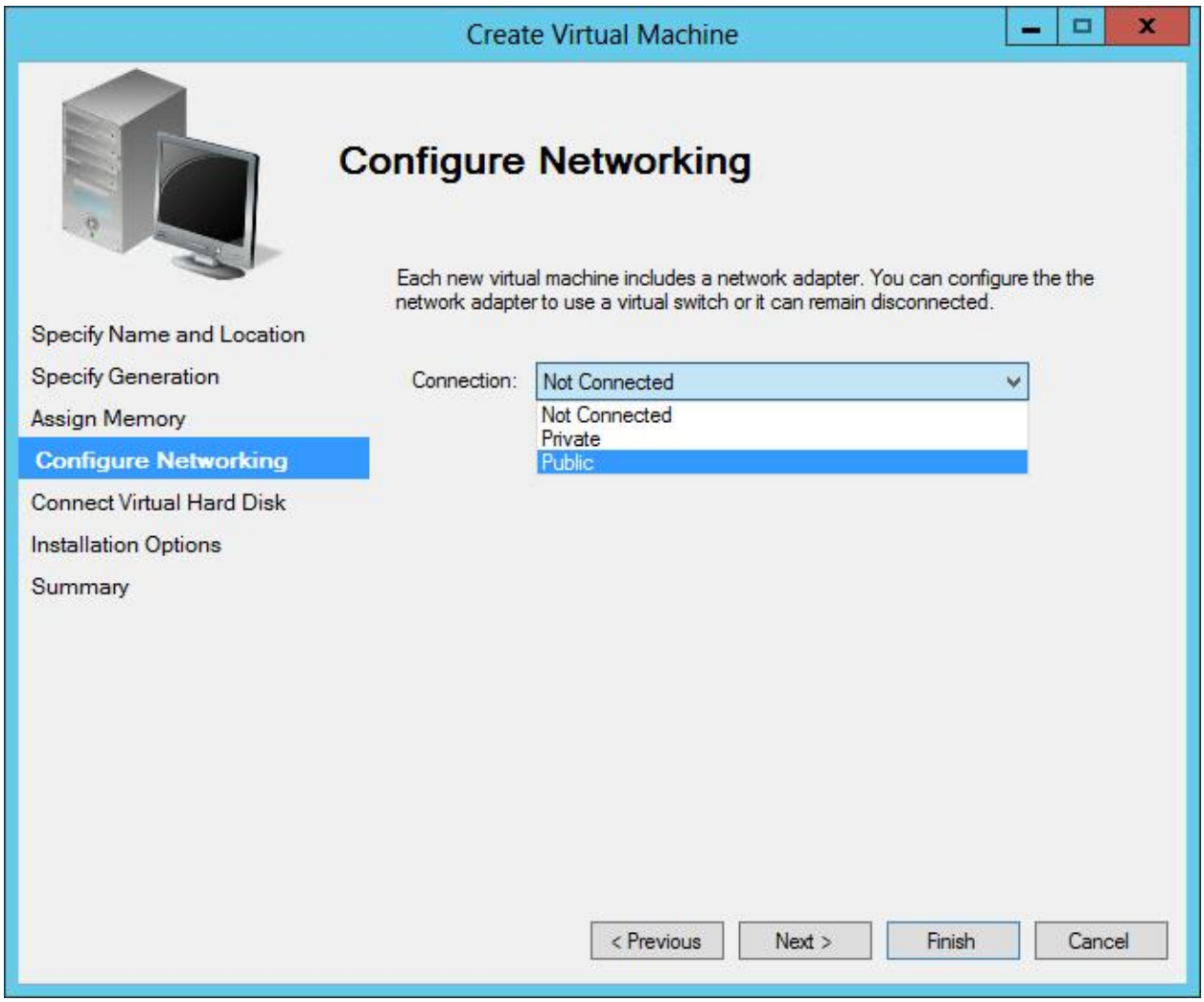

Attention! Please configure network prior to VM creation.

Configure a network adapter for the new VM. You can select one of the following values:

- Not connected. There will be no virtual network adapter attached to the new VM. The VM will remain disconnected from the network until the network adapter is added at a later time.
- Any adapter presents on the list. It depends on what kind of virtual network switches have been previously configured on the host (refer to the "configuration" section). The new VM will be using this connection.

Click **Next**.

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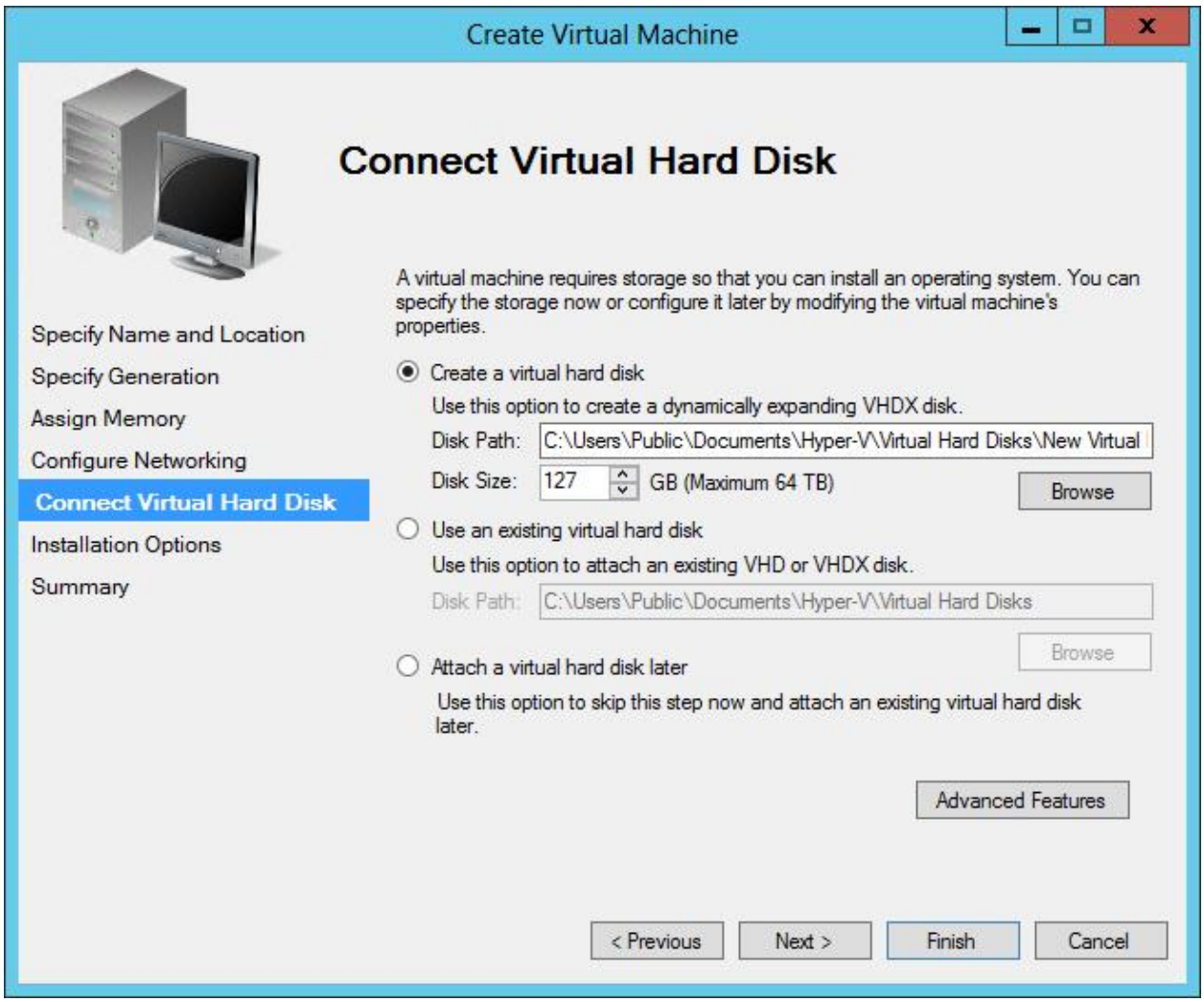
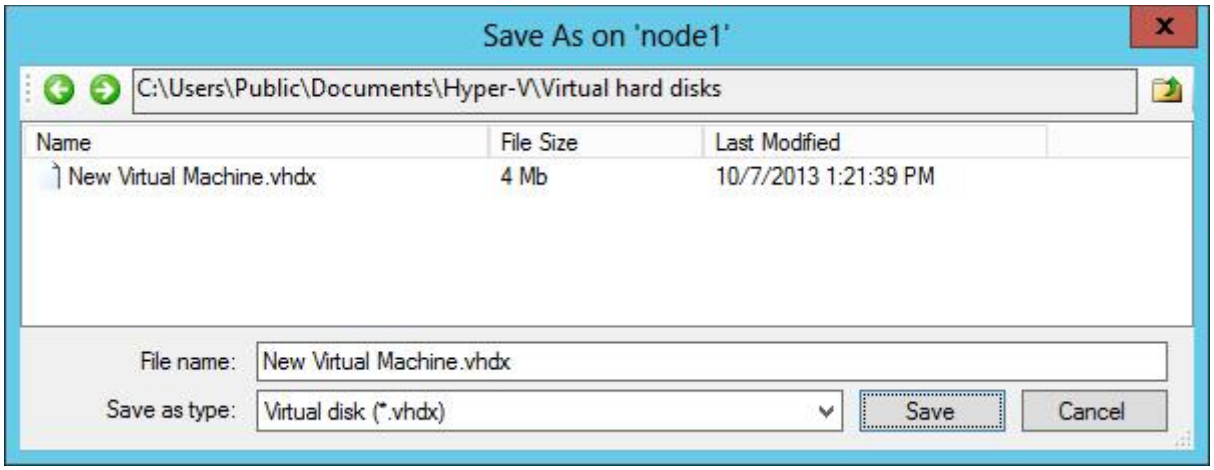


Connect a virtual hard disk for the new VM. Options are as follows:

- Create a new virtual hard disk. The new empty virtual disk in VHDX format will be created at the default location (*%\Users\Public\Documents\Hyper-V\Virtual Hard Disks\New Virtual Machine.vhdx*). You can change the default size (127 GB) up to 64 TB maximum value for the new virtual hard disk. You also can select a different location as the file name by clicking the **Browse** button:



- Use an existing virtual hard disk. This option allows you to select the existing virtual hard disk of either VHD or VHDX format, located in *%\Users\Public\Documents\Hyper-*

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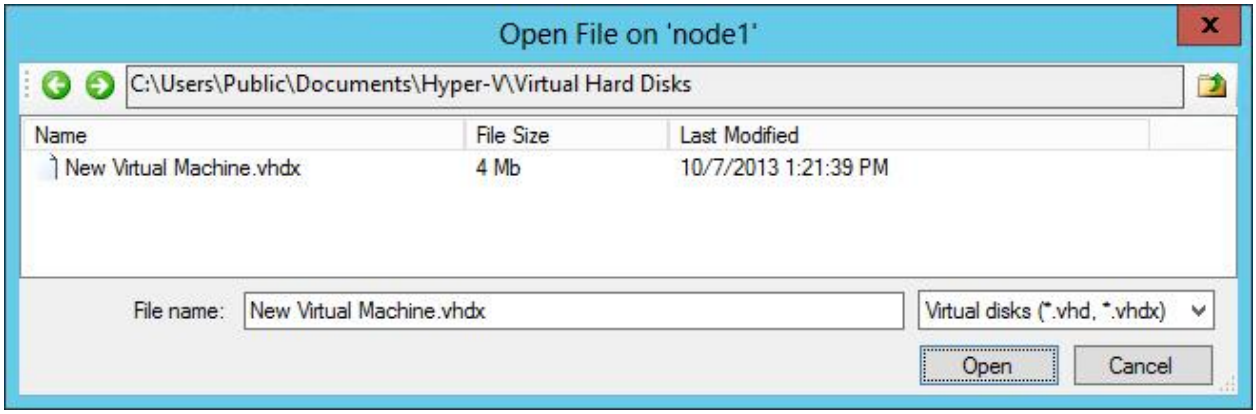
V\Virtual Hard Disks folder by default. To select the existing virtual disk, click the **Browse** button and locate the VHD or VHDX file, either at the default path or any other:



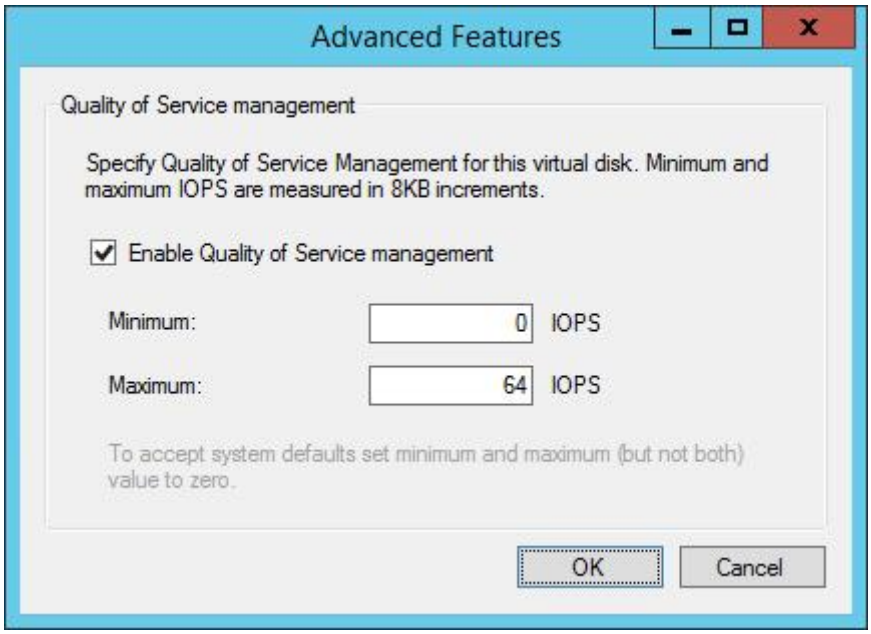
- Attach a virtual hard disk later. The new VM will be created without virtual hard disk. You will be able to attach it later.

QoS management

If the VM is created on the host and running Windows Server 2012 R2, the advanced features are available when attaching a virtual hard disk. These features consist of managing the Quality of Service by setting the minimum and maximum input/output operations per second (IOPS) for the virtual hard disk attached to the VM. To set these parameters, click the **Advanced Features** button on the wizard.

Note. The **Advanced Features** button appears on the wizard only for the hosts running Windows Server 2012 R2, since the QoS management feature applies to these hosts only.

The **Advanced Features** dialog will appear:



Tick the **Enable Quality of Service management** box to enable this feature and set minimum and maximum IOPS in 8 KB increments. Click **OK**. Click **Next** on the wizard.

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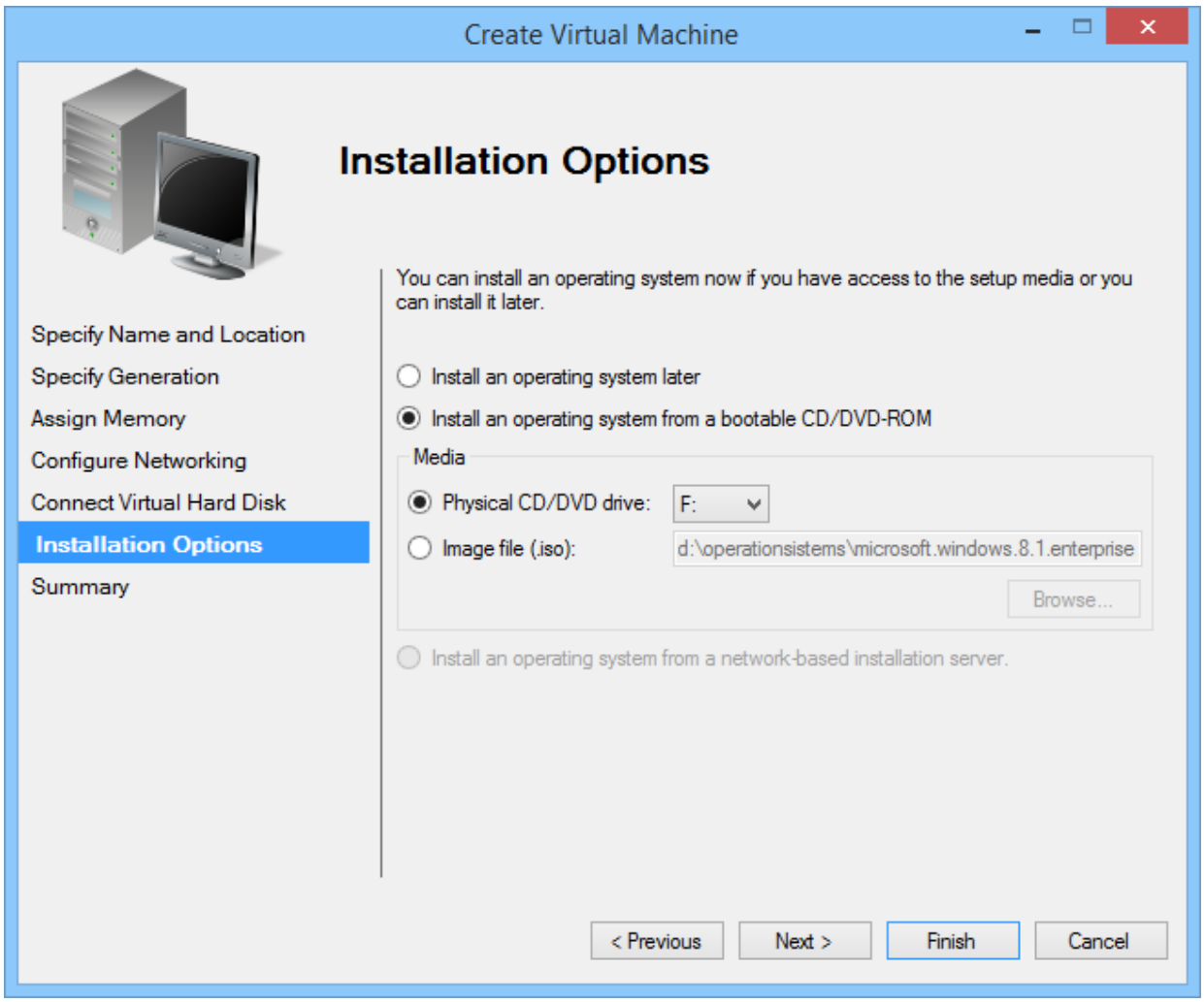

Select one of the following OS installation options:

- **Install an operating system later**. When choosing this option, there will be no OS installed on the VM during the creation process, but you will be able to install it later. To install OS on a newly created VM, connect to it via 5nine Guest Console and select installation *.iso* file from **Media** menu.
- **Install an operating system from a bootable CD/DVD-ROM**. Select the media type from which to install the OS:
  - **Physical CD/DVD drive** – Use this option to install the OS from physical CD or DVD drive available on the host;

Note. This function is not available for Generation 2 VMs.

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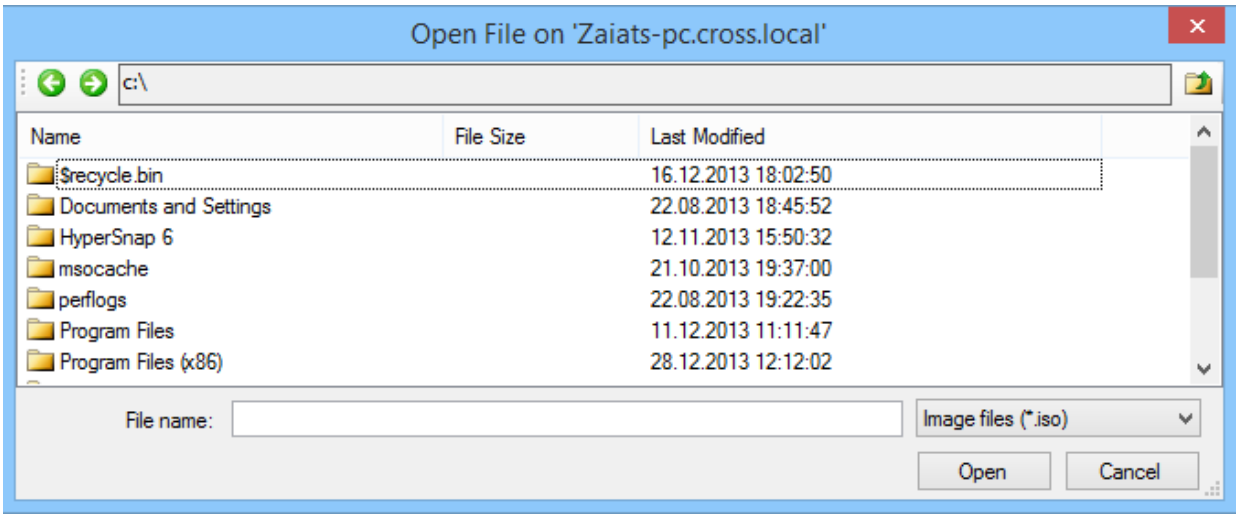
- **Image file (.iso)** – Use this option to install the OS from disk image file. You will have to locate the file by clicking the **Browse** button and choosing the path to the *.iso* file:



- **Install an operation system from a network-based installation server** – Use this option to install the OS from a network. This function is not available for Generation 2 when the network adapter is connected.

Click **Next**.

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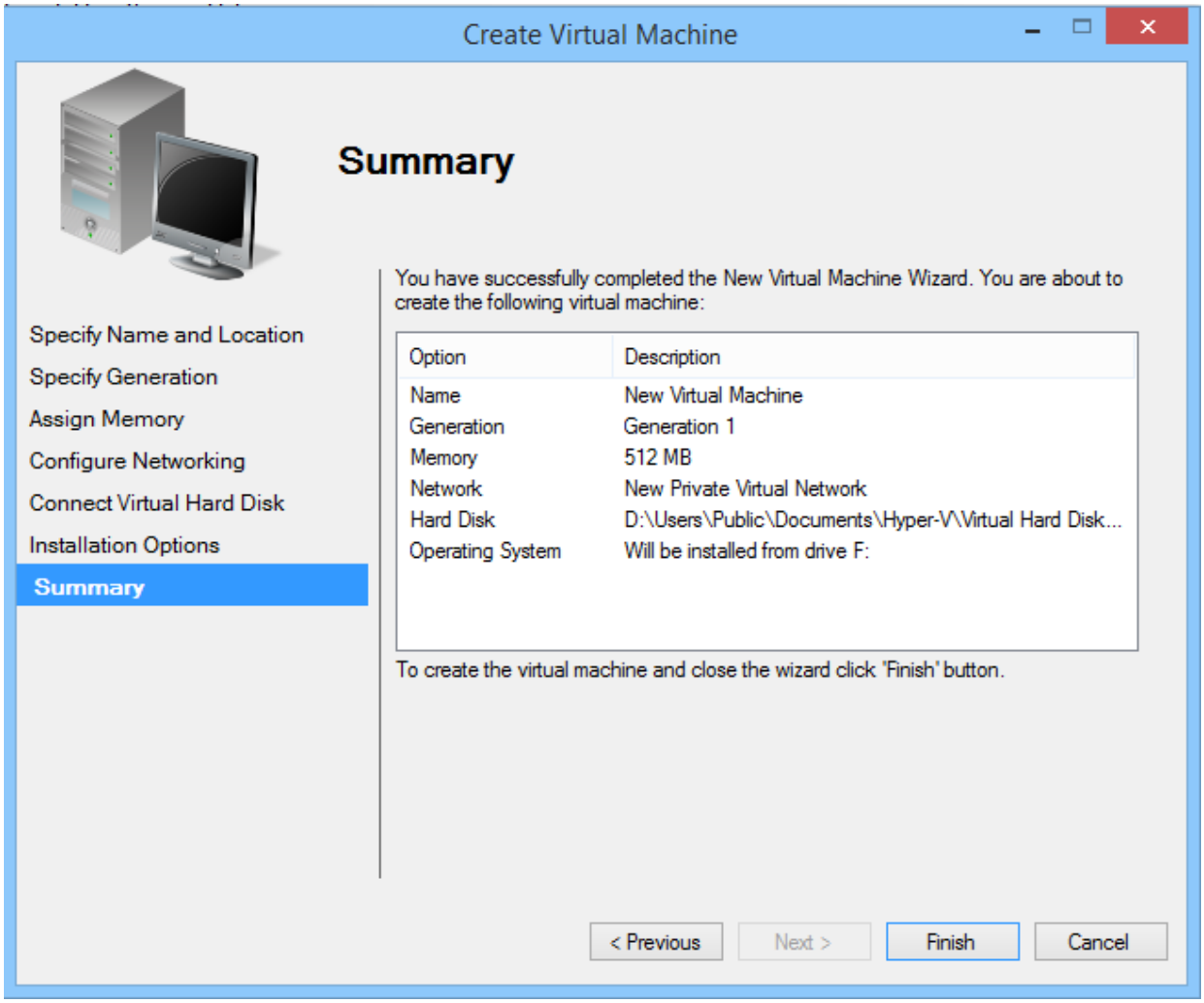

Review the summary information for the new VM and click **Finish** to complete the creation process.

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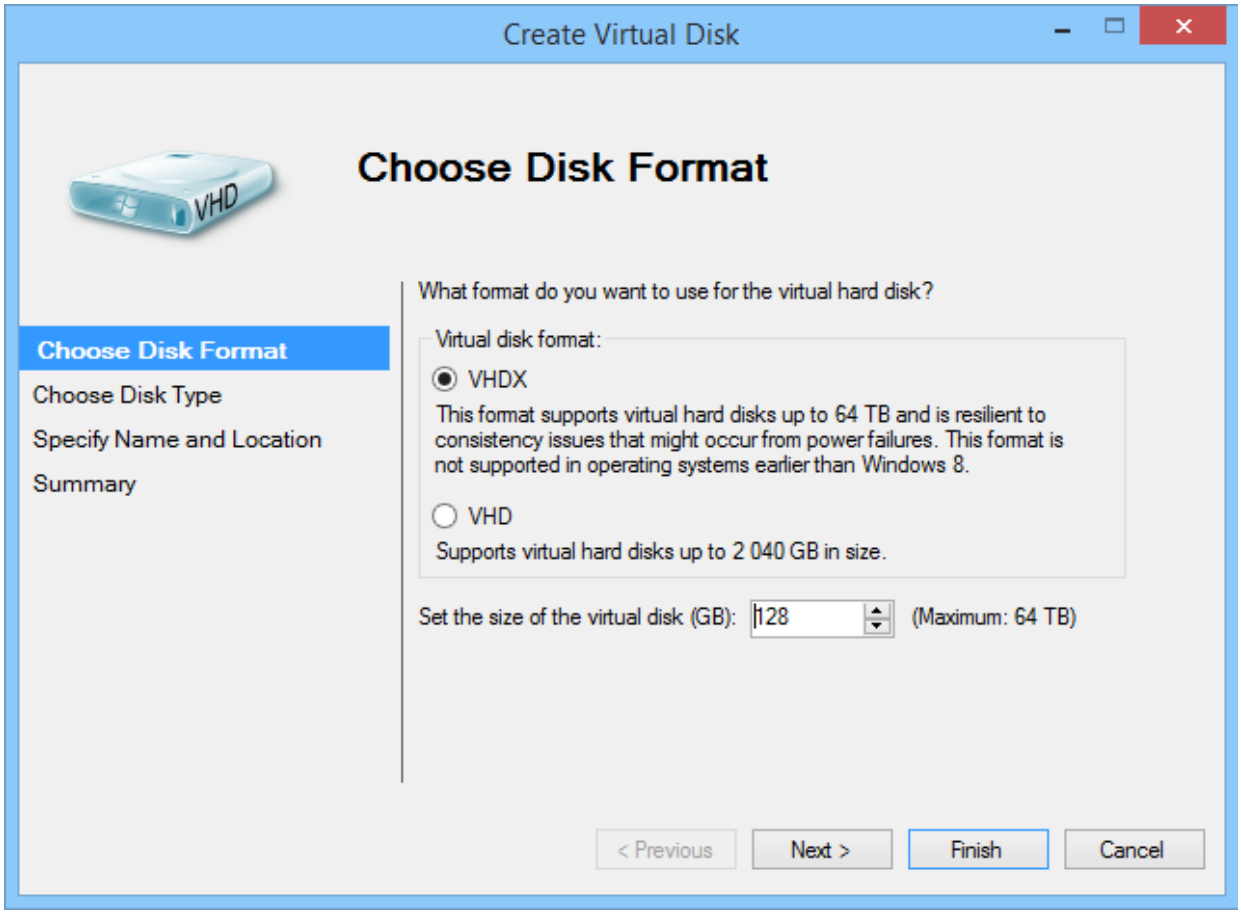
Creating a new virtual hard disk

To create a new virtual hard disk, first select the host on which the disk is created in 5nine Manager for Hyper-V object tree. The host can be either a separate entity or a part of the cluster. In the last case, the new virtual hard disk will be created on the cluster shared volume and could be accessed by its nodes. Click the (**Create Virtual Disk**) button on the main panel menu or **Edit** → **Create Virtual Disk** menu command. The **Create Virtual Disk** wizard will be opened:



- Set the format for the new virtual hard disk:
  - **VHDX** (default setting) – the new virtual disk format that supports size up to 64 TB and is able to protect itself from being corrupted due to power failures. Requires OS Windows 8 or later.
  - **VHD** – the older virtual disk format that supports size up to 2040 GB and can be used in older OS Windows versions.
- Set the size of the virtual disk in GB. The default size is 128 GB. You can use the arrows to the right of the field to alter this figure.

Note. If you click Finish at this or any of the following steps, the new virtual disk will be created with the default parameters that were not altered during the creation process.

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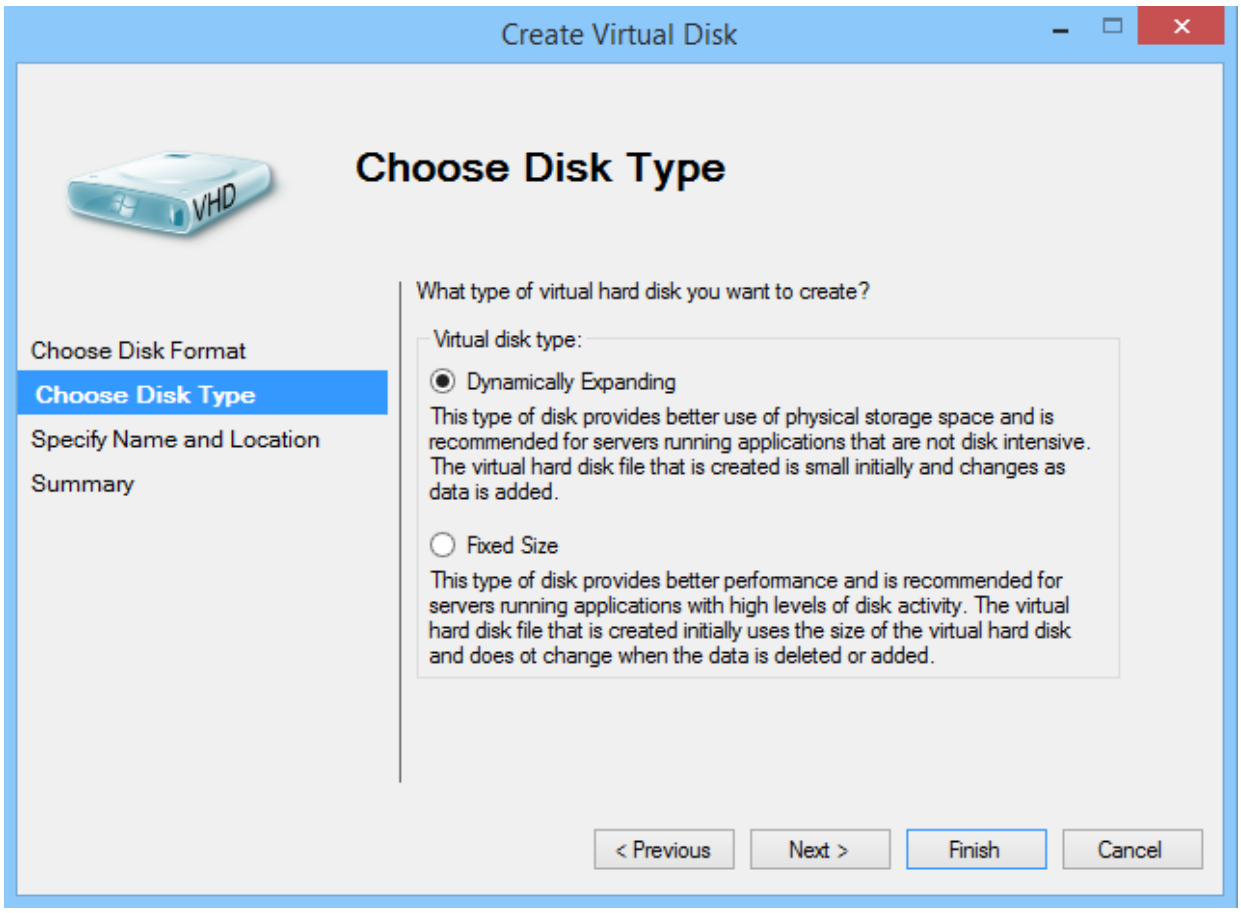

Set the type for the new virtual disk:

- **Dynamic Expanding** (default setting) – the virtual disk will be dynamically expanded or reduced as the data is added or deleted. This type saves the physical hard drive space, but reduces disk performance;
- **Fixed Size** – the virtual disk size will remain unchanged as it is set regardless of the data being written onto it. This type keeps the performance level, but does not save physical space on the hard drive.

Click **Next**.

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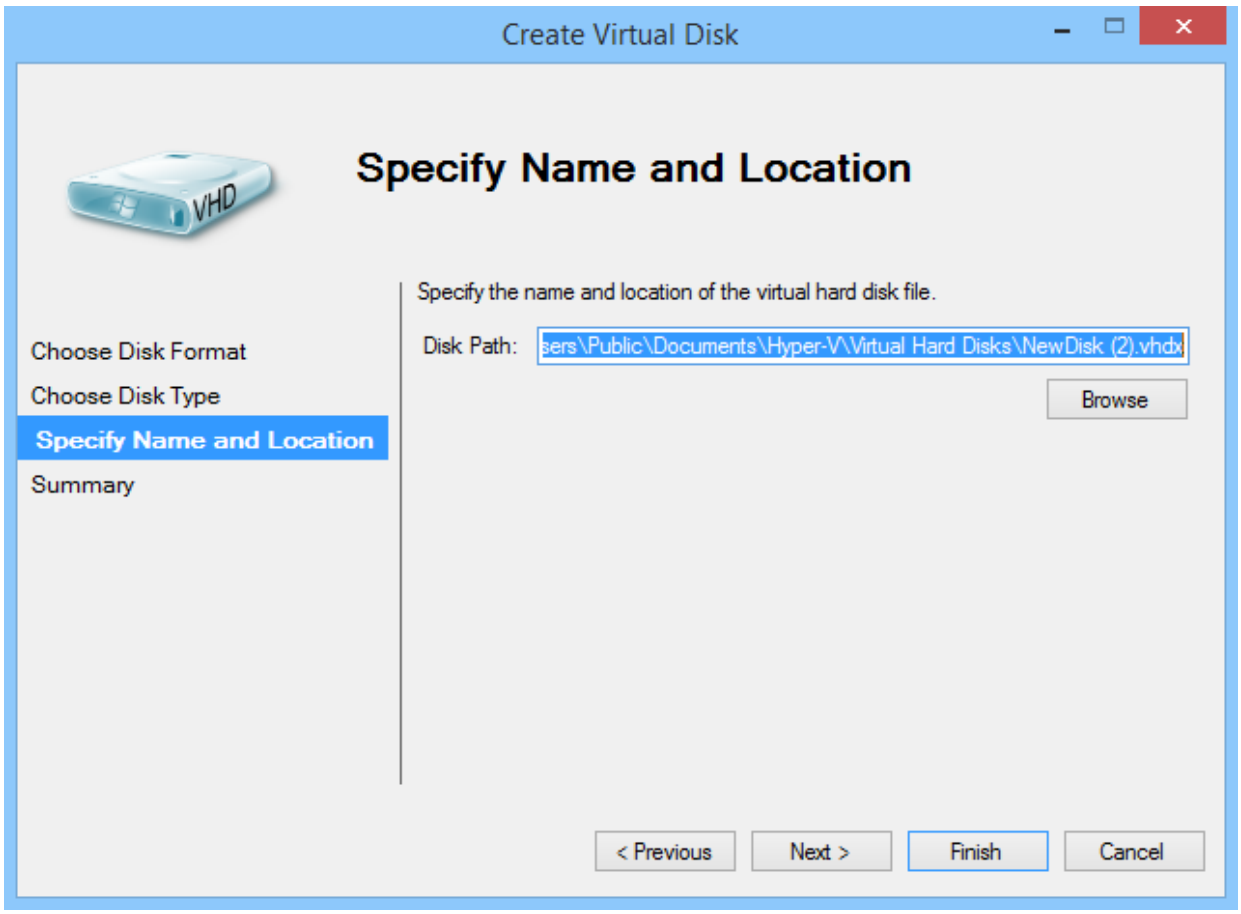
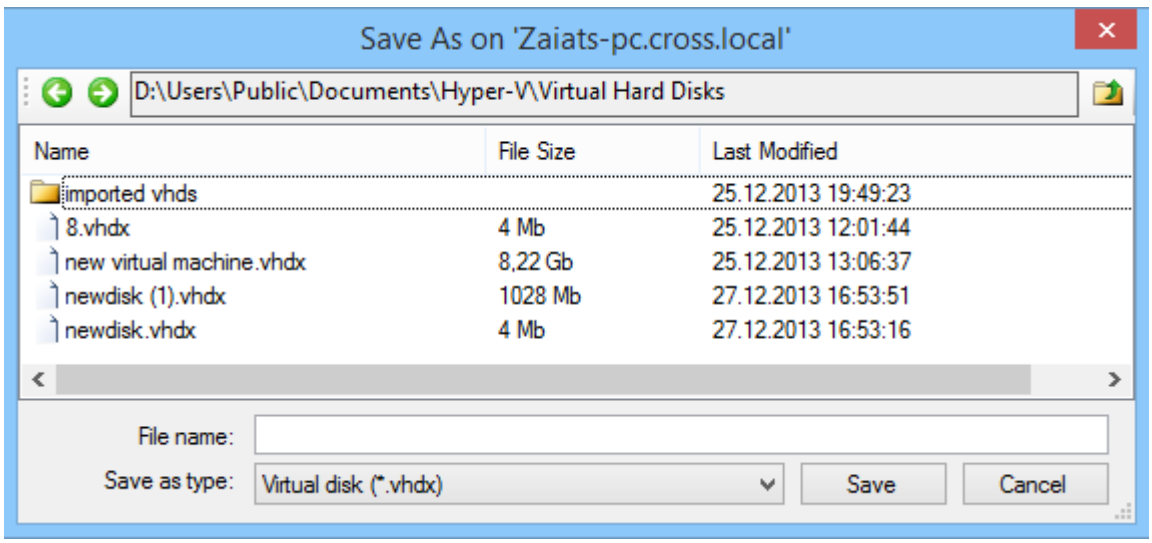


Specify the name and location for the virtual hard disk file. The default location and name are *%\Users\Public\Documents\Hyper-V\Virtual Hard Disks\NewDisk.vhdx* for locally created virtual hard disks. You can change the default name and path by entering the desired values in the **Disk Path** field manually, or by clicking the **Browse** button and then selecting the location and entering the desired file name in the following dialog:



Click **Save** and then click **Next**.

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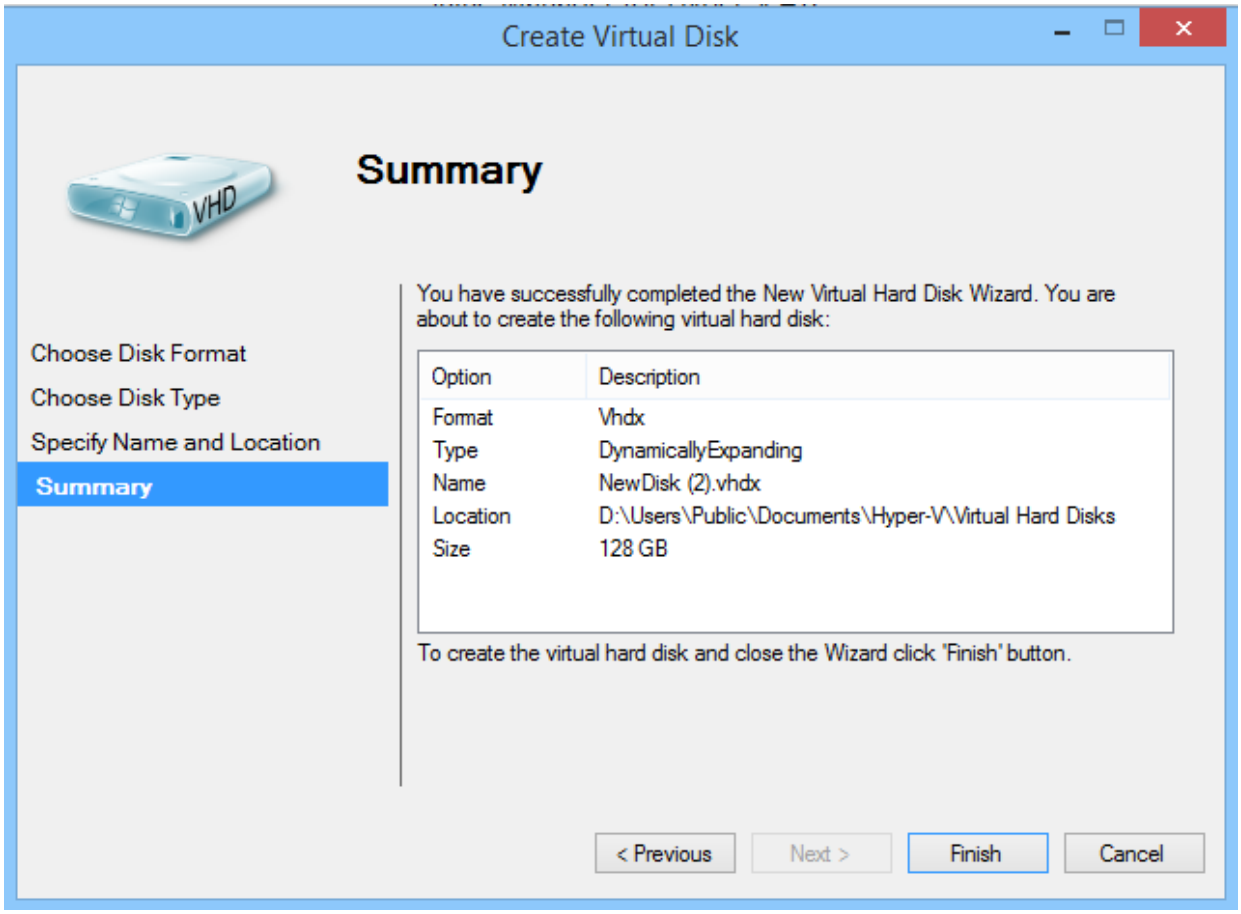
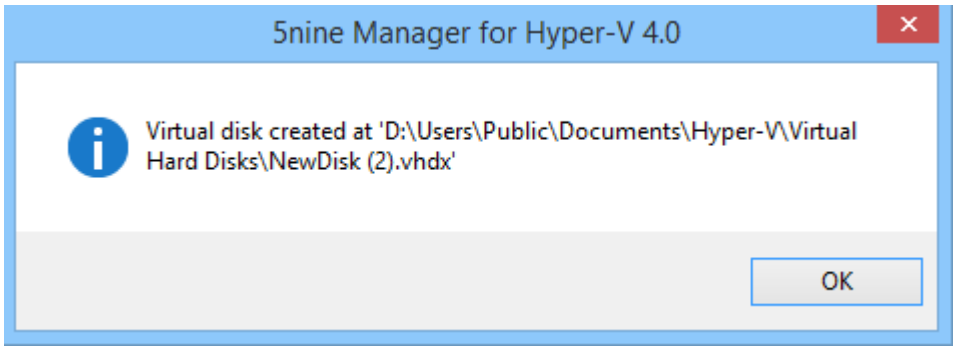


Review the summary information for the new virtual hard disk and click **Finish** to complete the creation process. The following message will appear in the case of successful operation:



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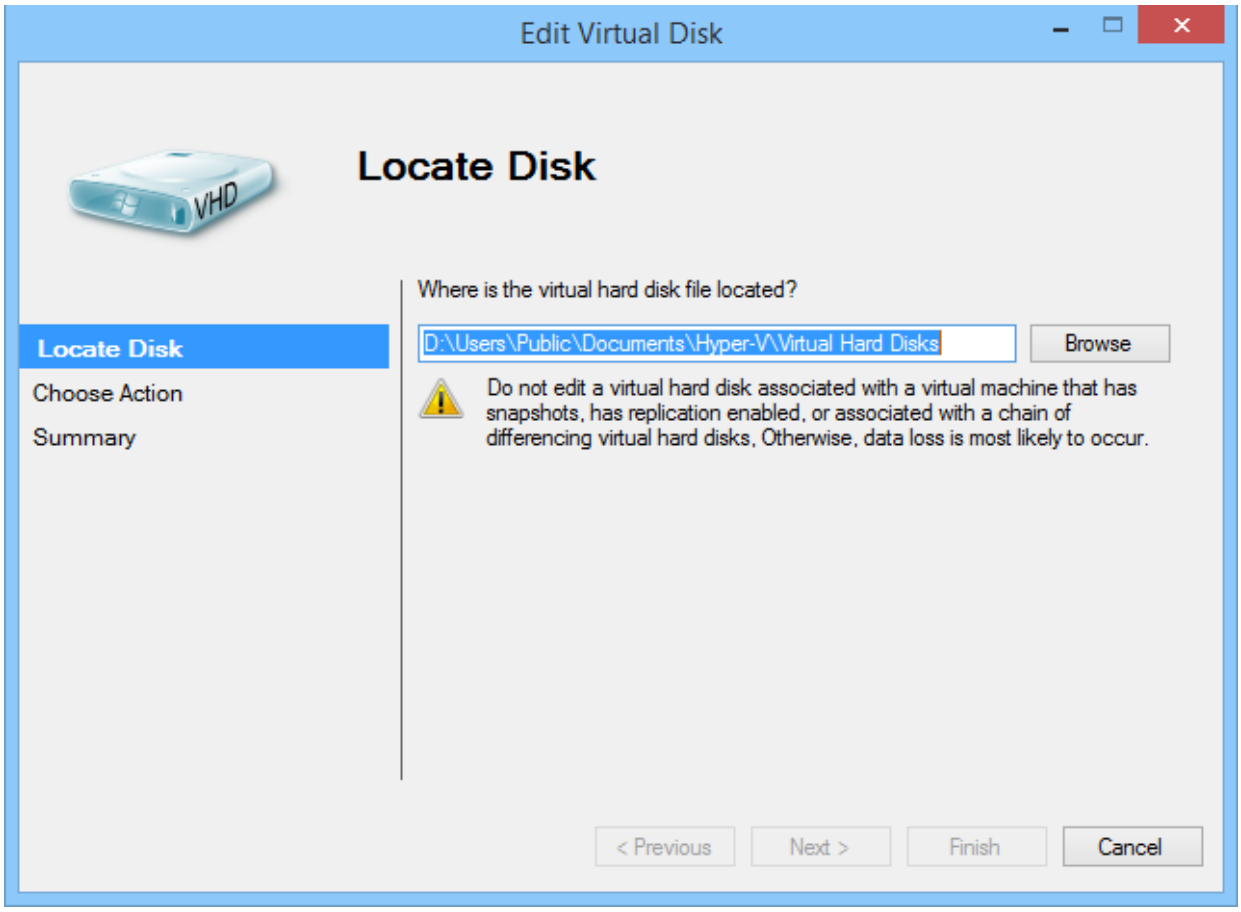
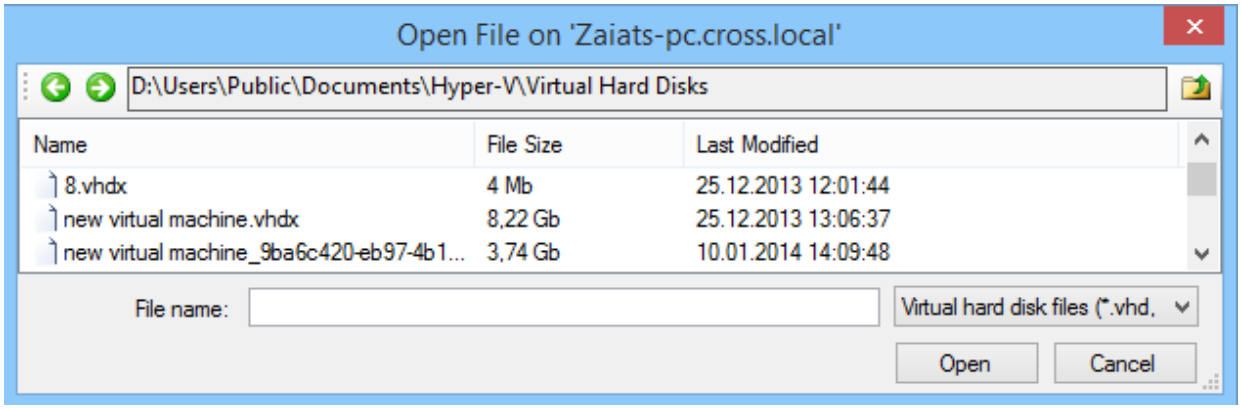
Editing virtual hard disk

To edit an existing virtual hard disk, first select the host on which the disk is located in 5nine Manager for Hyper-V object tree. The host can be either a separate entity or a part of the cluster. It will only affect the default location of the existing virtual disk, but you will be able to select either one during the editing process. Click the  (**Edit Virtual Disk**) button on the main panel menu or **Edit** → **Edit Virtual Disk** menu command. The **Edit Virtual Disk** wizard will be opened:



Specify the location of the existing virtual hard disk file. The default location is *%\Users\Public\Documents\Hyper-V\Virtual Hard Disks* for virtual hard disks located on the local host. Click the **Browse** button and then select the existing virtual hard disk:



Click Open.

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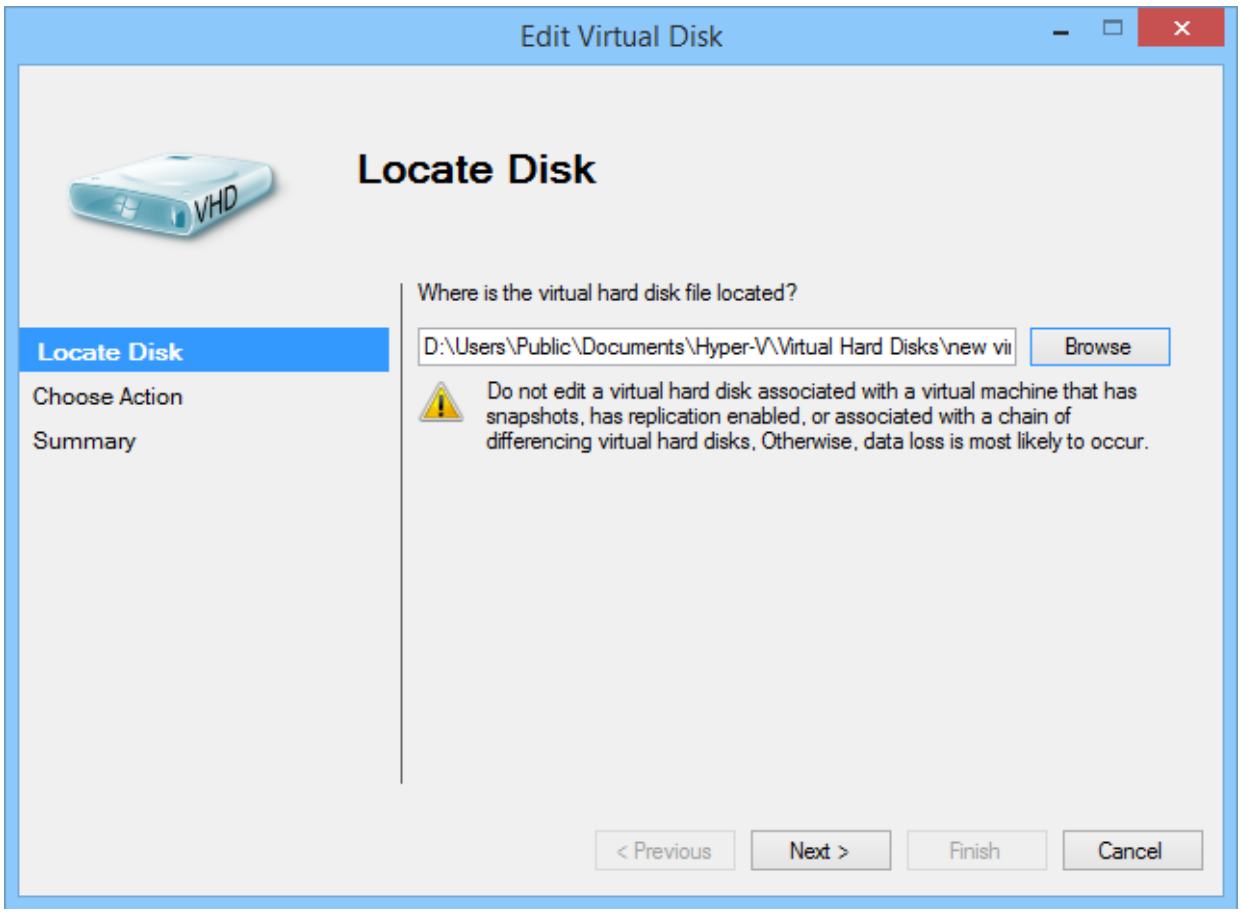
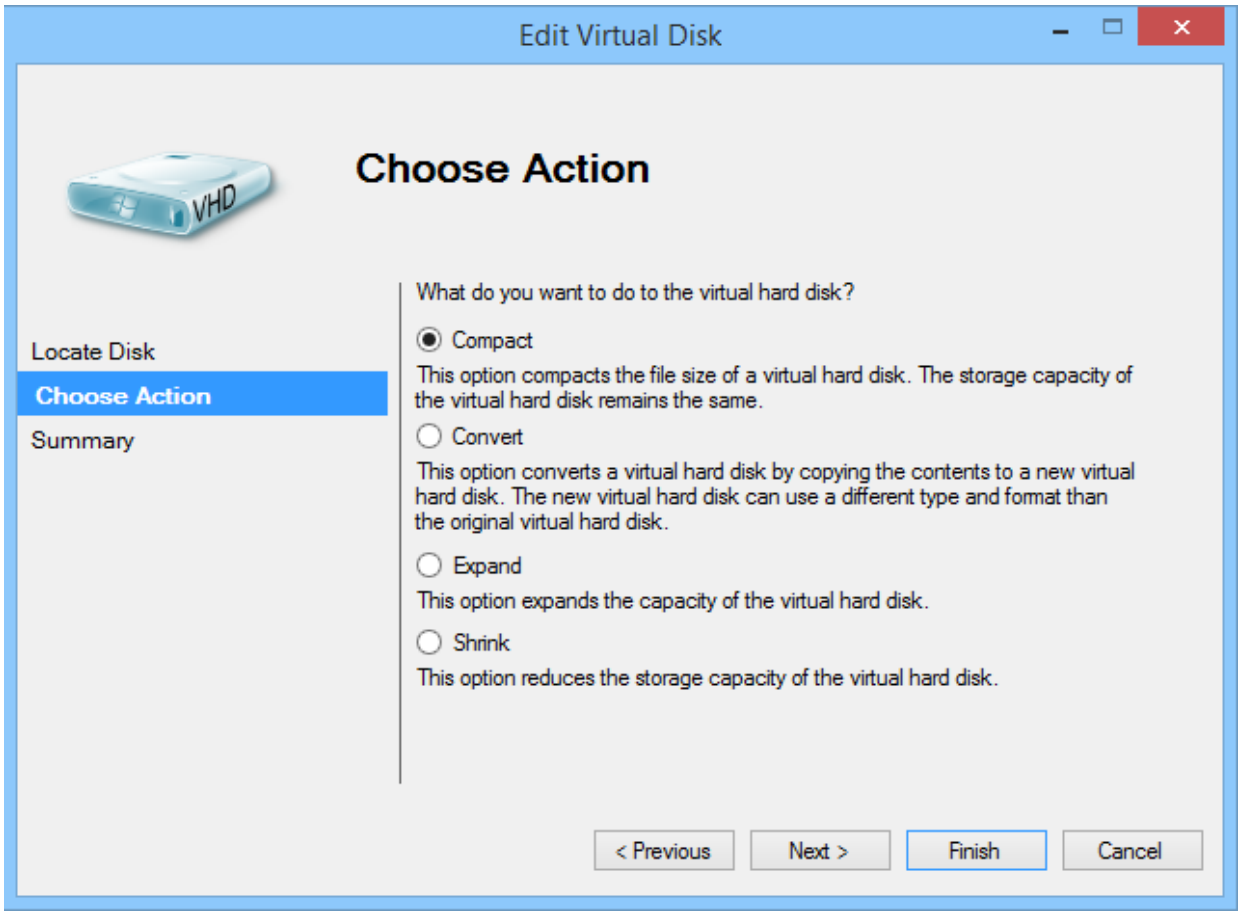


The full path of the selected virtual hard disk will be shown in the field. Click **Next**.



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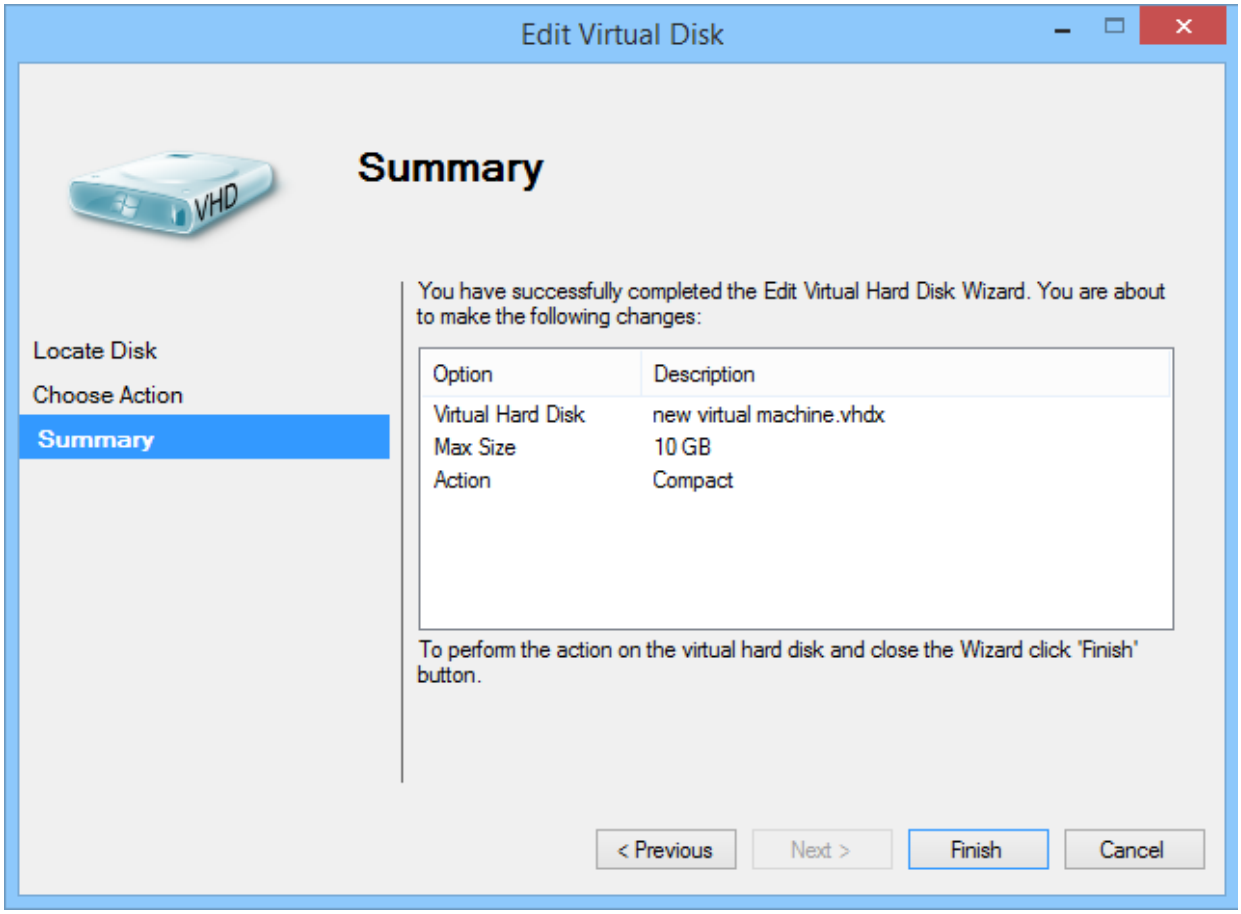
Choose from the following actions, which will depend on what you want to do with the virtual hard disk:

- **Compact**. This option will reduce the size of the virtual hard disk, but the storage capacity will remain the same. Click **Next**.
- **Convert**. This option will copy the existing virtual hard disk to a new virtual hard disk. At the next step, you will be able to choose a different type and format than the original virtual hard disk.
- **Expand**. This option will expand the capacity of the existing virtual hard disk.
- **Shrink**. This option will reduce the storage capacity of the virtual hard disk. This applies only to the virtual hard disks with fixed size.

Click **Next**. The following steps will vary depending on the action selected.

Compact action:



Review the summary for compact action and click **Finish** to complete the editing process of the virtual hard disk.

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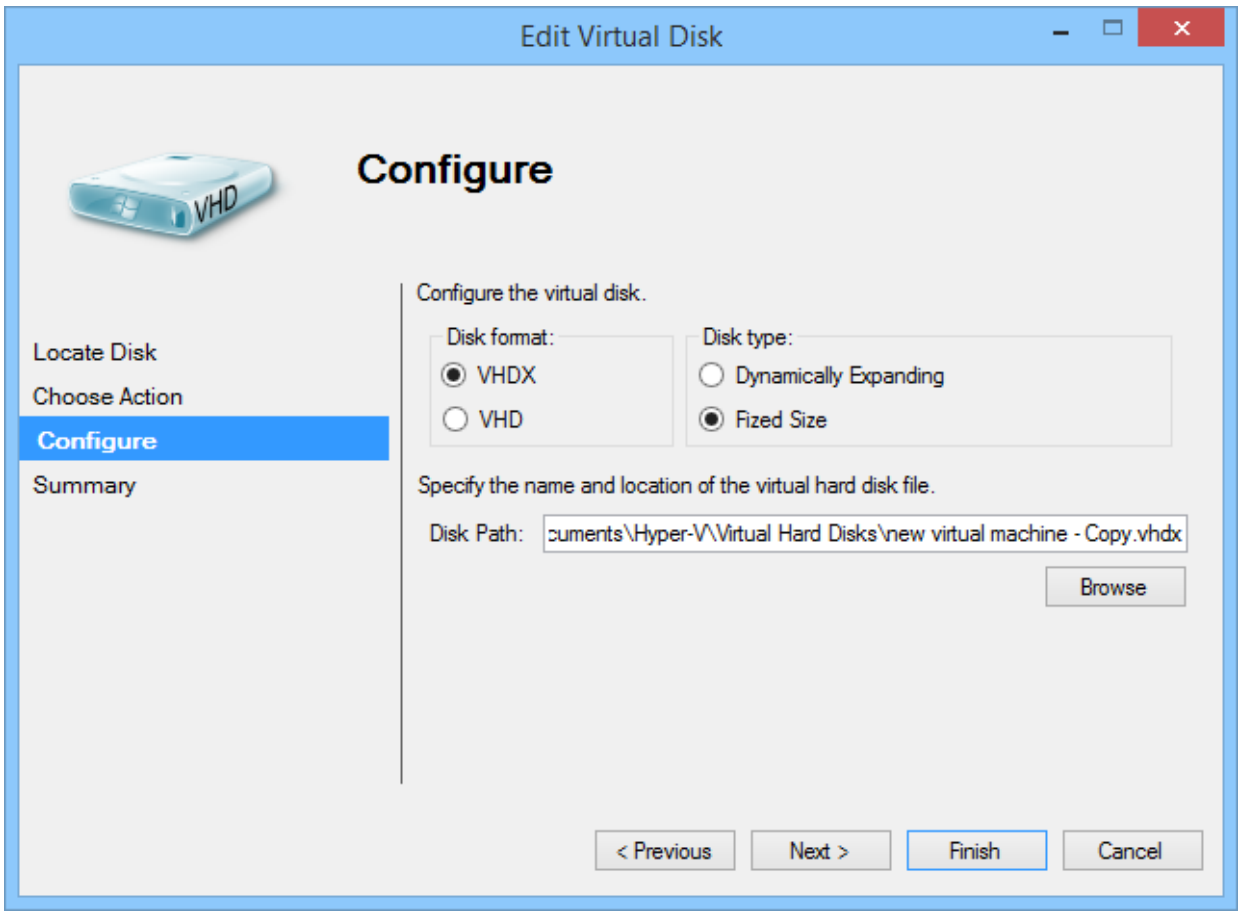
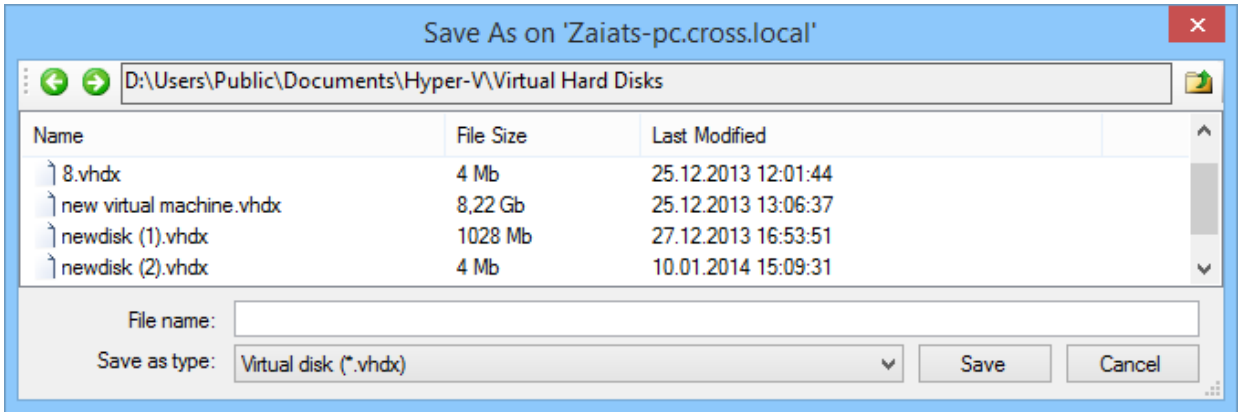
Convert action:



Reconfigure the parameters to convert the existing virtual hard disk:

- **Disk format**. Select the format VHDX or VHD for the converted disk. Omit this parameter if you want to leave it the same as the original virtual hard disk.
- **Disk type**. Select the type for the converted disk. Omit this parameter if you want to leave it the same as the original virtual hard disk.
- **Disk Path**. Specify the name and location for the virtual hard disk file. The default location and name are *% C:\Users\Public\Documents\Hyper-V\Virtual Hard Disks\NewDisk - Copy.vhdx* for local virtual hard disks. You can change the default name and path by entering the desired values in the **Disk Path** field manually or click the **Browse** button and then select the location and enter the desired file name in the following dialog:



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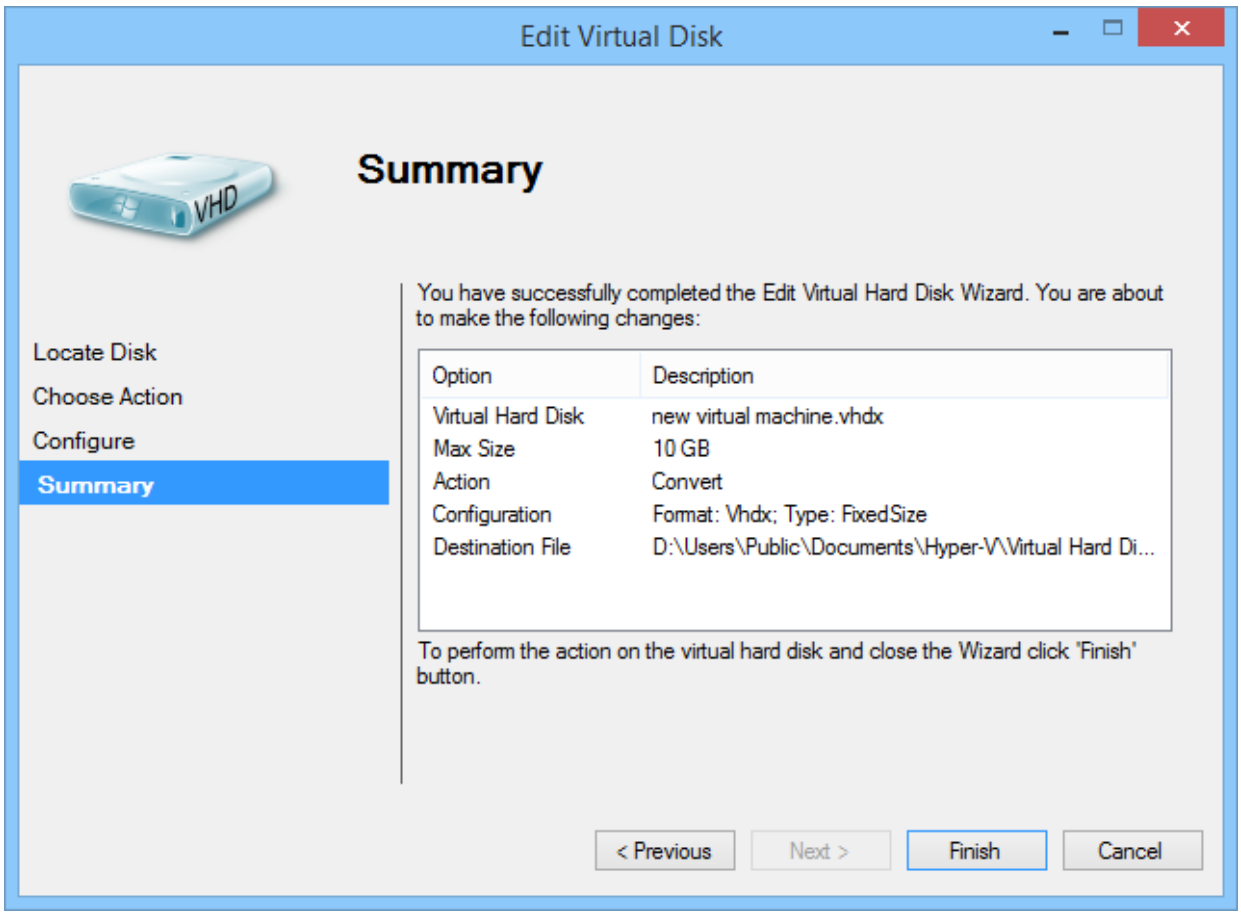
Click **Save** and then click **Next**.



Review the summary for convert action and click **Finish** to complete the editing process of the virtual hard disk.

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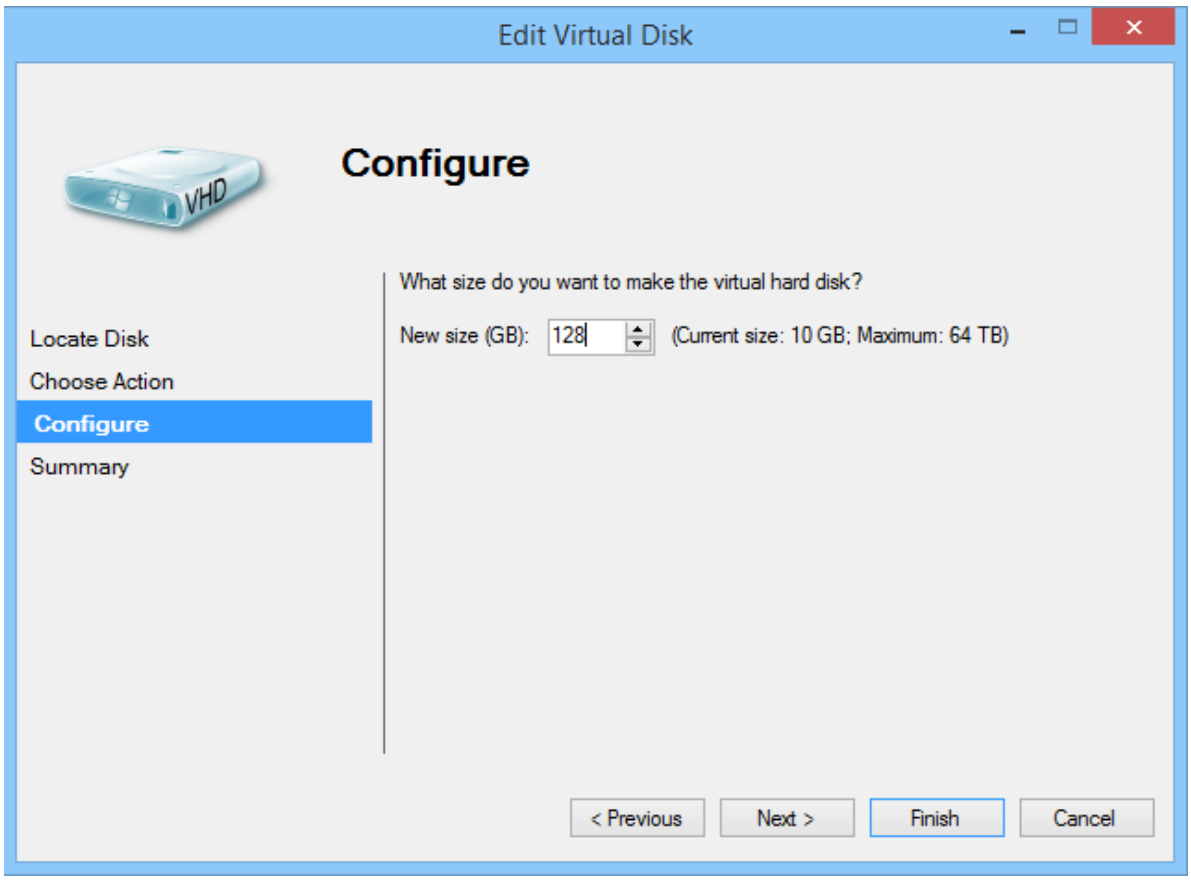
Expand action:



Set the new size of the virtual disk in GB. You can use the arrows to the right of the field to set this figure. The maximum size depends on the virtual hard disk format – 64 TB for VHDX and 2040 GB for VHD. Click **Next**.

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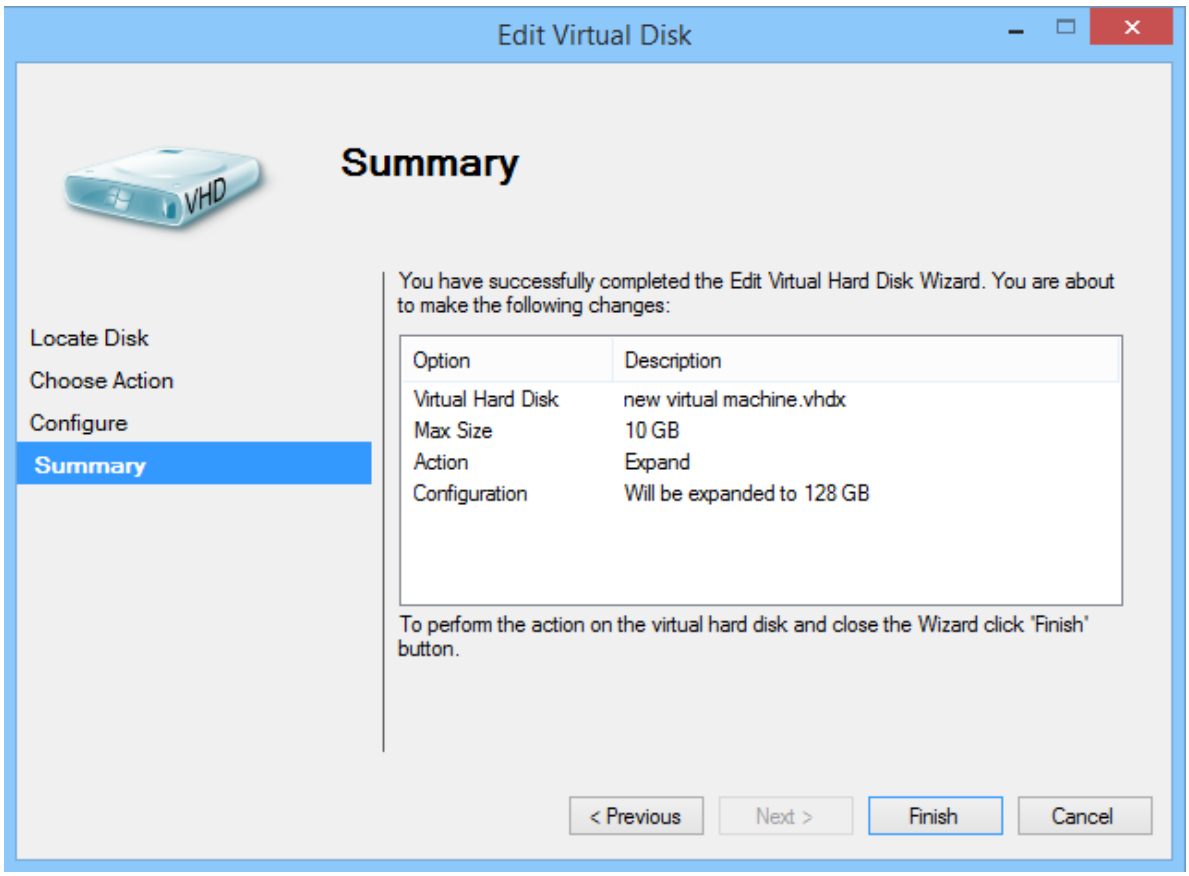

Review the summary for the expand action and click **Finish** to complete the editing process of the virtual hard disk.

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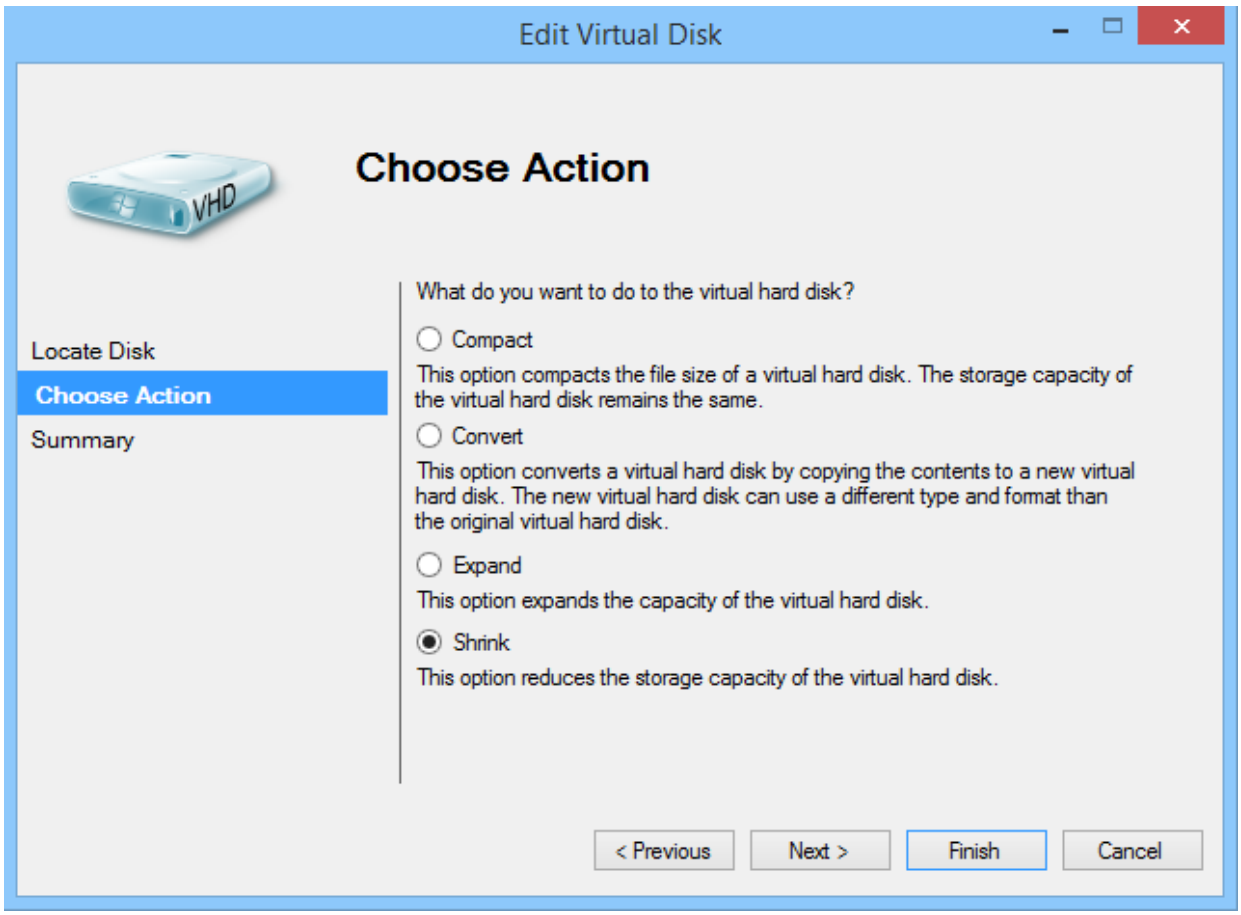
Shrink action:



This option will reduce the storage capacity of the virtual hard disk. This only applies to fixed size virtual hard disks.

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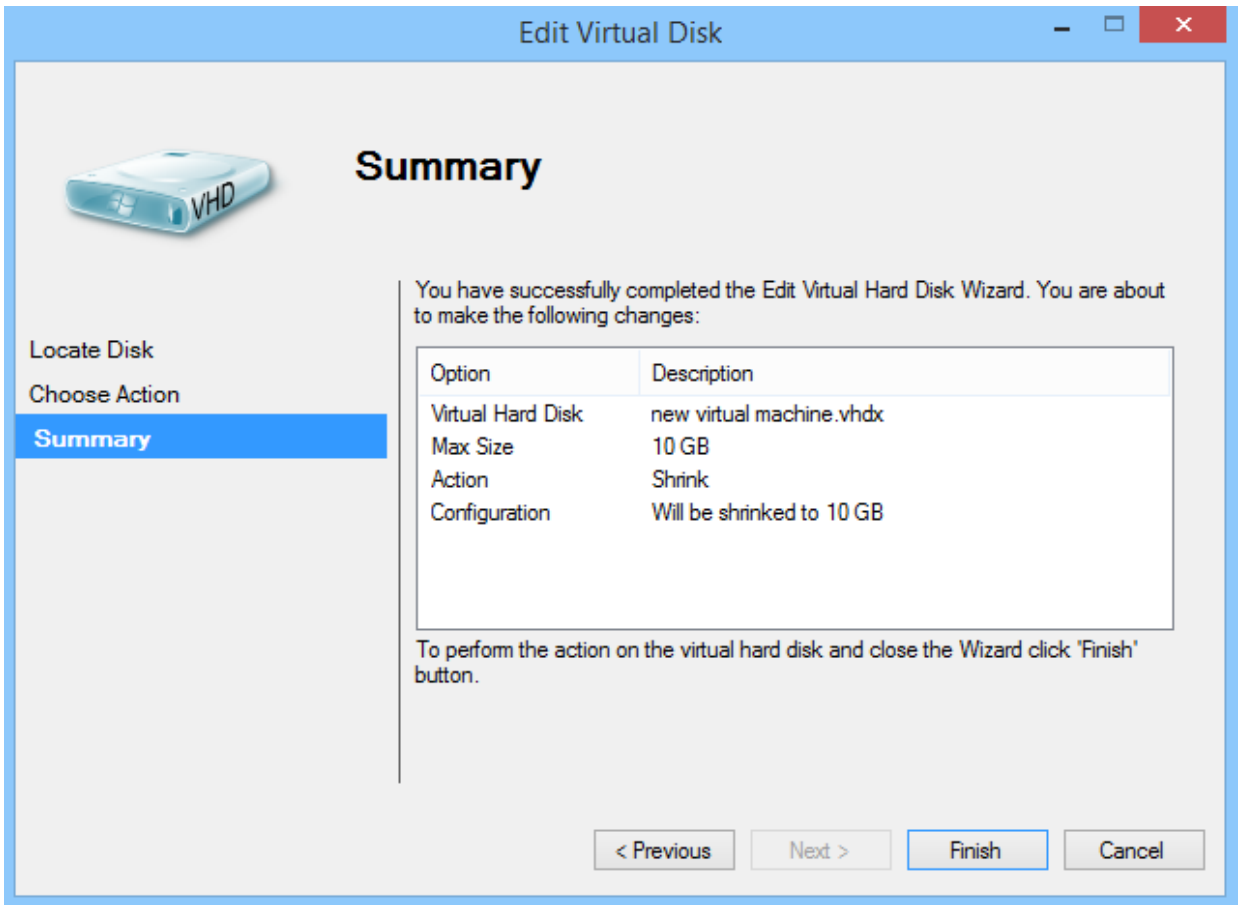

Review the summary for shrink action and click **Finish** to complete the editing process of the virtual hard disk.

Operations with virtual machines

All the operations with the existing VMs are done on the **Hyper-V Manager** tab. 5nine Manager for Hyper-V supports standard operations with virtual machines (corresponding right-click commands are also available for these actions):

- Start. To start the VM, click the **Start** button on the **Hyper-V Manager** tab menu panel.
- Turn off. To turn the VM off. click the **Turn Off** button on the **Hyper-V Manager** tab menu panel.
- Shut down. To shut the VM down, click the **Shutdown** button on the **Hyper-V Manager** tab menu panel.
- Save. To save the VM, click the **Save** button on the **Hyper-V Manager** tab menu panel.
- Pause/Resume. To pause or resume the VM, click the **Pause** (**Resume**) button on the **Hyper-V Manager** tab menu panel.
- Reset. To reset the VM, click the **Reset** button on the **Hyper-V Manager** tab menu panel.
- Snapshots: Create, Delete, Apply, Revert, Rename.

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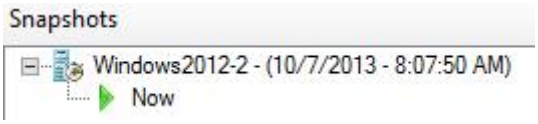
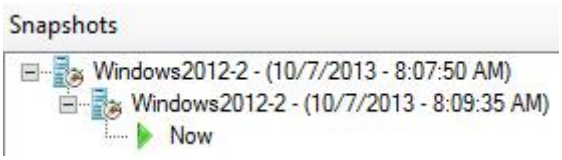
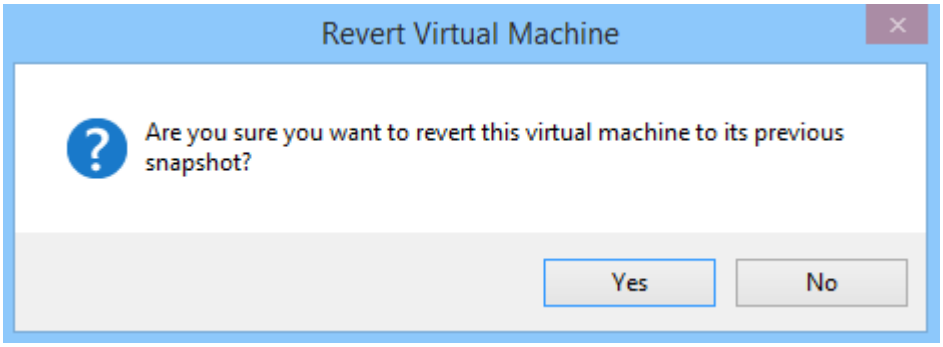
To create a snapshot for the VM, click the **Snapshot** button on the **Hyper-V Manager** tab menu panel. Snapshot will appear in the lower window in approximately one minute:



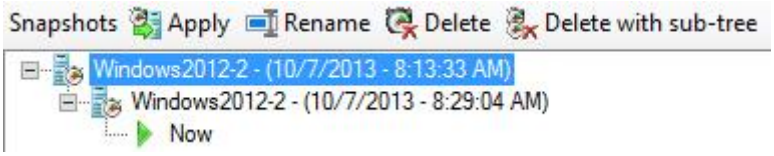
Further clicks on the **Snapshot** button will create subsidiaries to the previous snapshot:



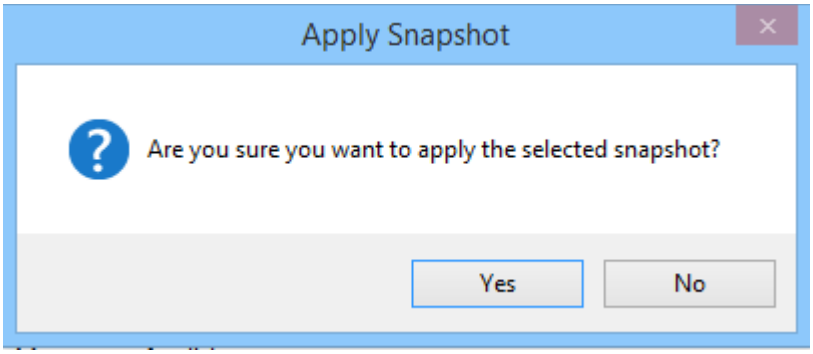
To revert the VM to its last taken snapshot, click the **Revert** button on the **Hyper-V Manager** tab menu panel. Confirm the operation:



To apply any snapshot from the tree to the VM, select the necessary snapshot and click the **Apply** button in the lower window panel:



Confirm the operation:



To delete the selected snapshot, click the **Delete** button in the lower window panel or **Delete with sub-tree** button, which will delete the whole sub-tree.

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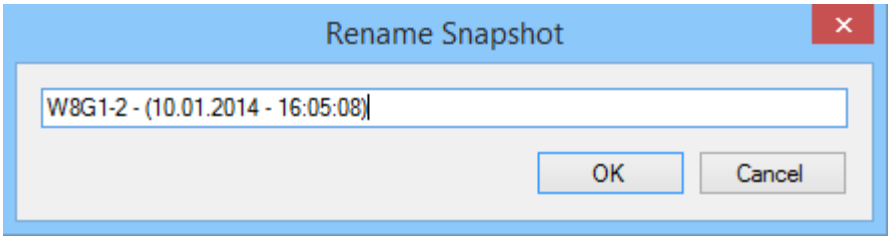
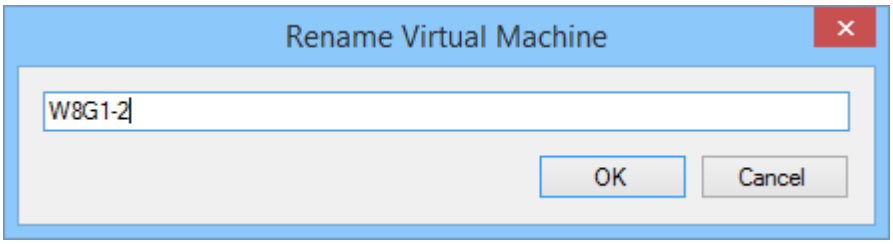
To rename the selected snapshot, click the **Rename** button in the lower window panel and then enter the new snapshot name in the dialog:



- Rename. To rename the selected VM click the **Rename** button on the **Hyper-V Manager** tab menu panel and then enter the new VM name in the dialog:



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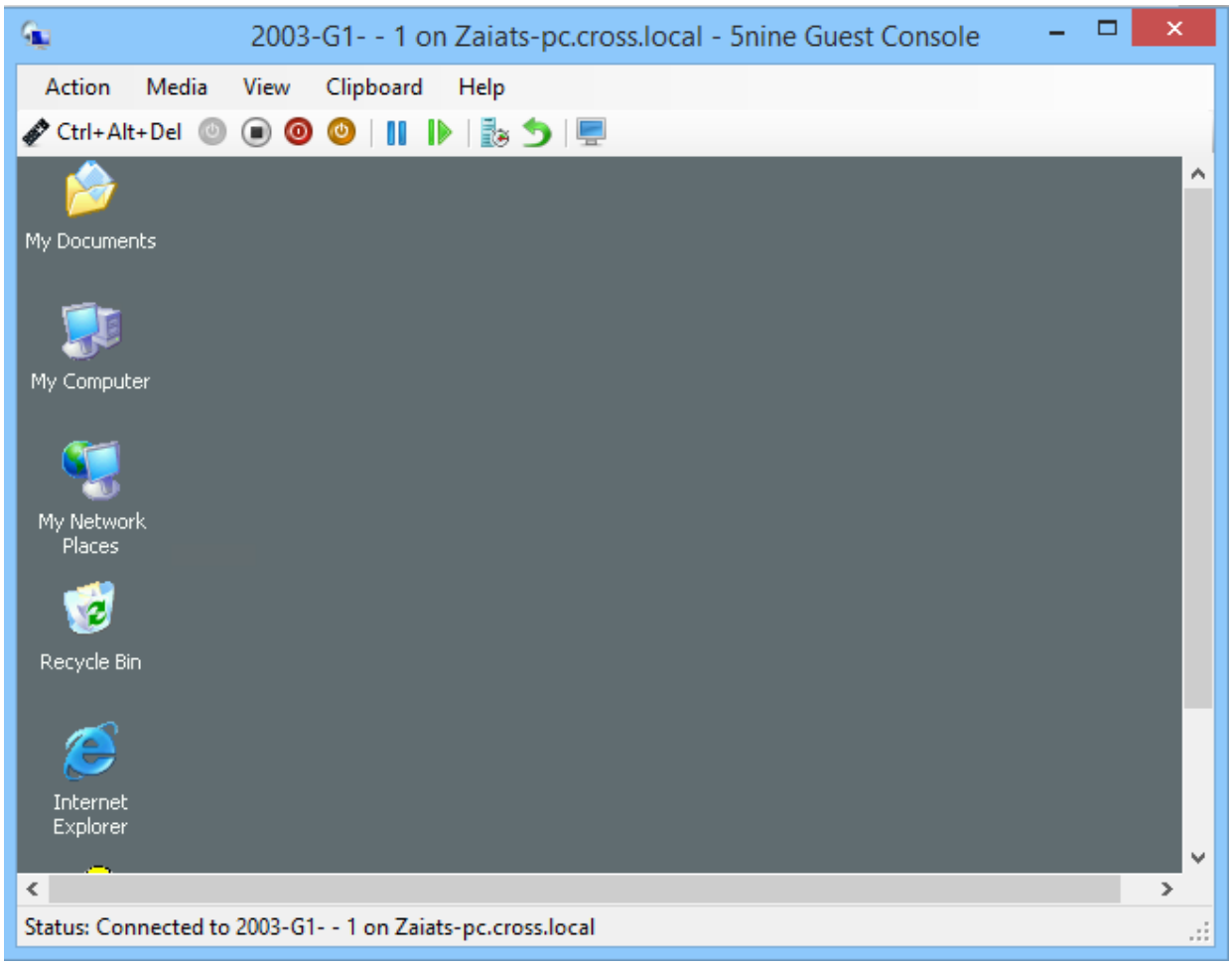
- Connect to a VM via Guest Console. To connect to the VM using 5nine Manager for Hyper-V Guest Console, double-click on the VM or click the **Connect** button on the **Hyper-V Manager** tab menu panel. The same operations are available on the Guest Console menu – Start, Turn Off, Shut Down, Save, Create Snapshot, Pause/Resume, Revert:



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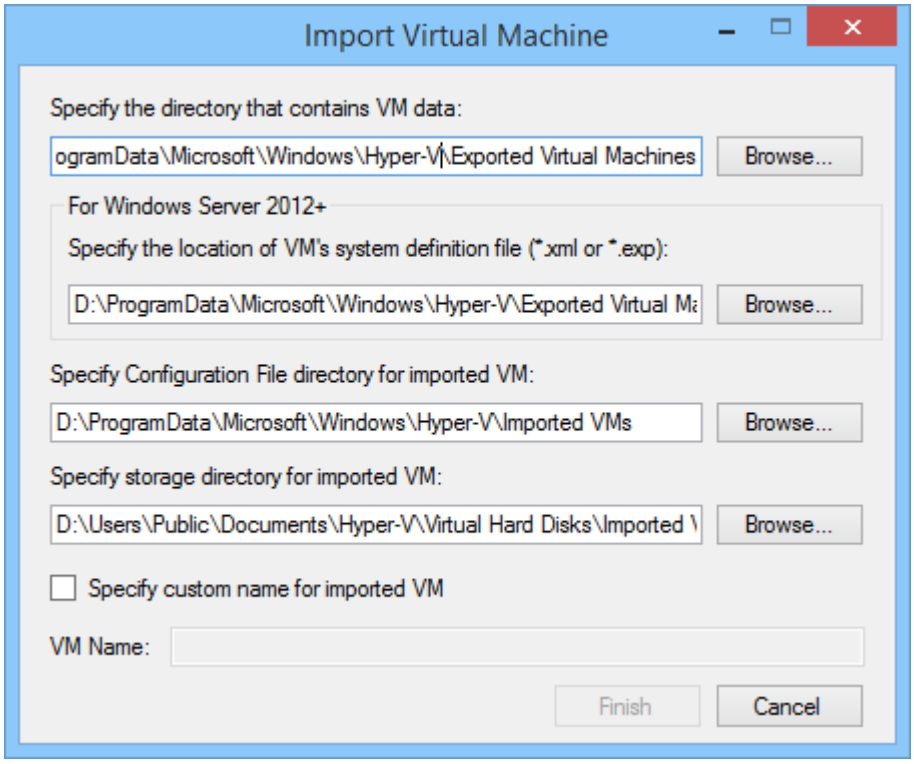
- Import VM

To import VM press the (**Import VM**) button on main panel menu or **Edit** → **Import VM** menu command. The Import VM wizard will be opened:



- Specify the directory that contains VM data:

Default location (%ProgramData%\Microsoft\Windows\Hyper-V\Exported Virtual Machines).

- Specify the location of VM's system definition file (.xml or *.exp)

Default location (%ProgramData%\Microsoft\Windows\Hyper-V\Exported Virtual Machines).

- Specify configuration file for the imported VM

Default location (%ProgramData%\Microsoft\Windows\Hyper-V\Imported VMs).

- Specify storage directory for imported VM

Default location (%Users%\Public\Documents\Hyper-V\Virtual Hard Disks\Imported VHDs).

With field **Specify custom name for imported VM**, you can choose the new name for the imported VM.

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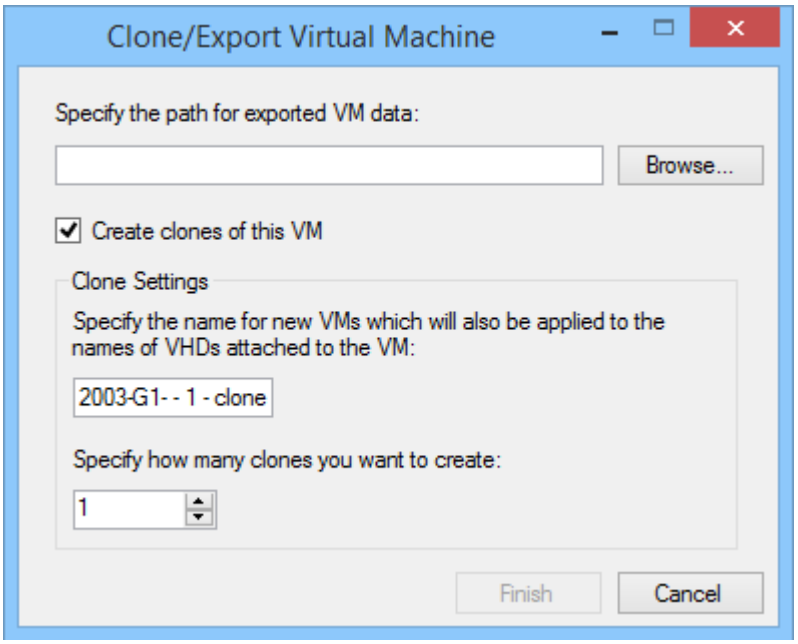
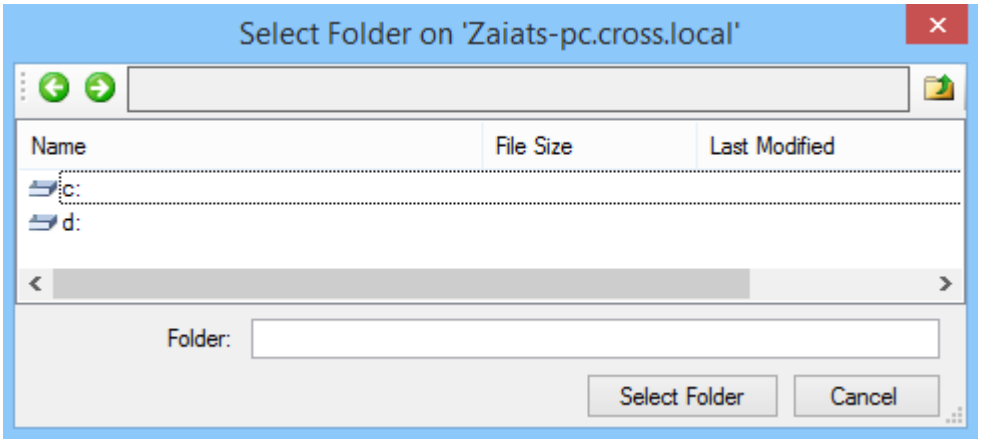
- Clone/Export. To clone your VM, right click on the VM and click the **Clone**/**Export** button.



You can select a folder for exported VM. Click the **Browse** button:



Choose your folder and click **Select Folder**.

It is possible to create a full clone of a VM. A maximum of 100 clones can be created.

- Change VM settings. To change VM settings, click the **Settings** button on the **Hyper-V Manager** tab menu panel. The Settings wizard will be opened (most of the settings can be altered only when the VM is in the "Off" or "Saved" state):

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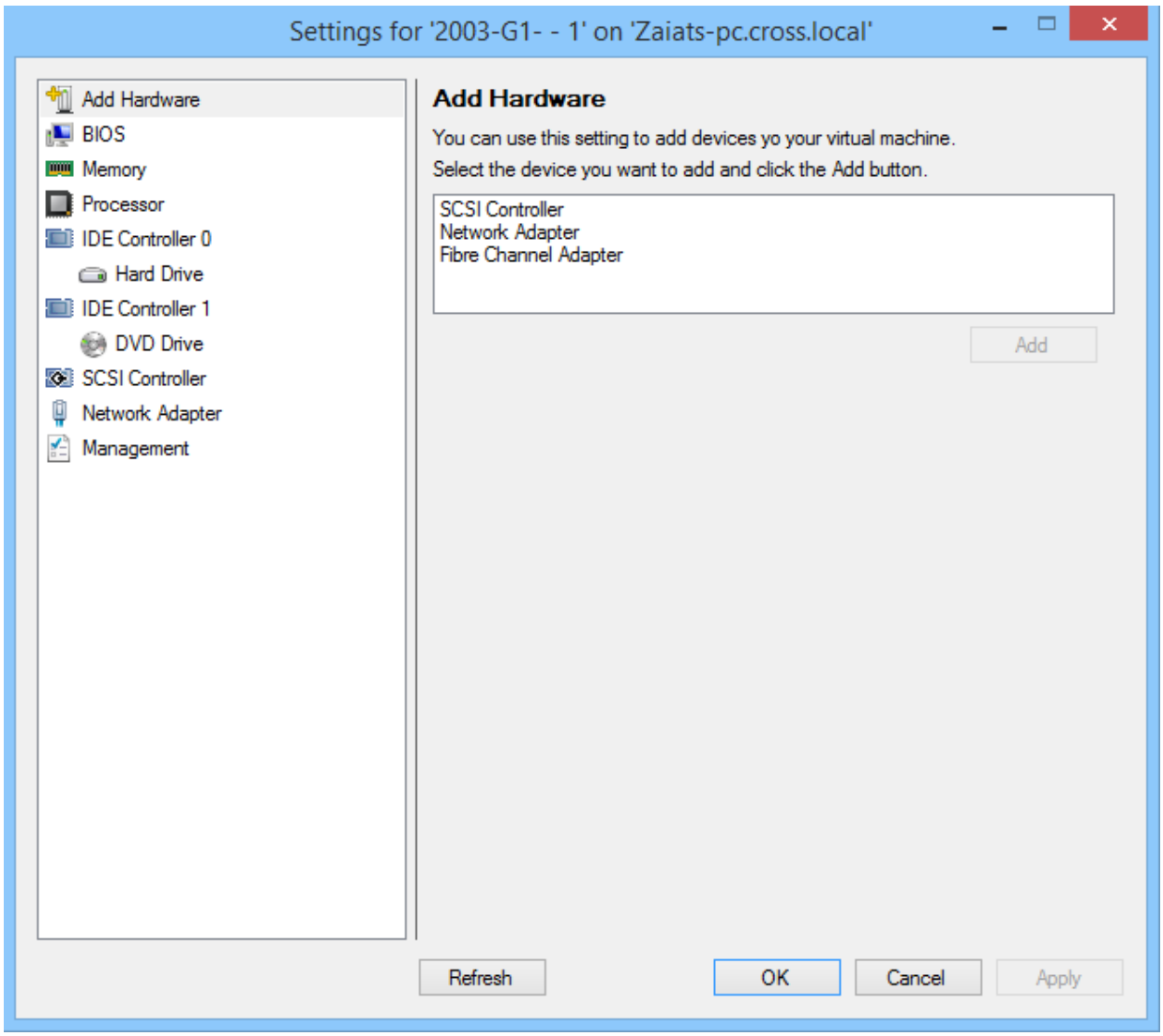

On the "Add Hardware" branch, select the type of device you want to add. Click the **SCSI controller** button so that you can attach a virtual hard disk, Network Adapter, and/or Fibre Channel Adapter. Click the **Add** button.

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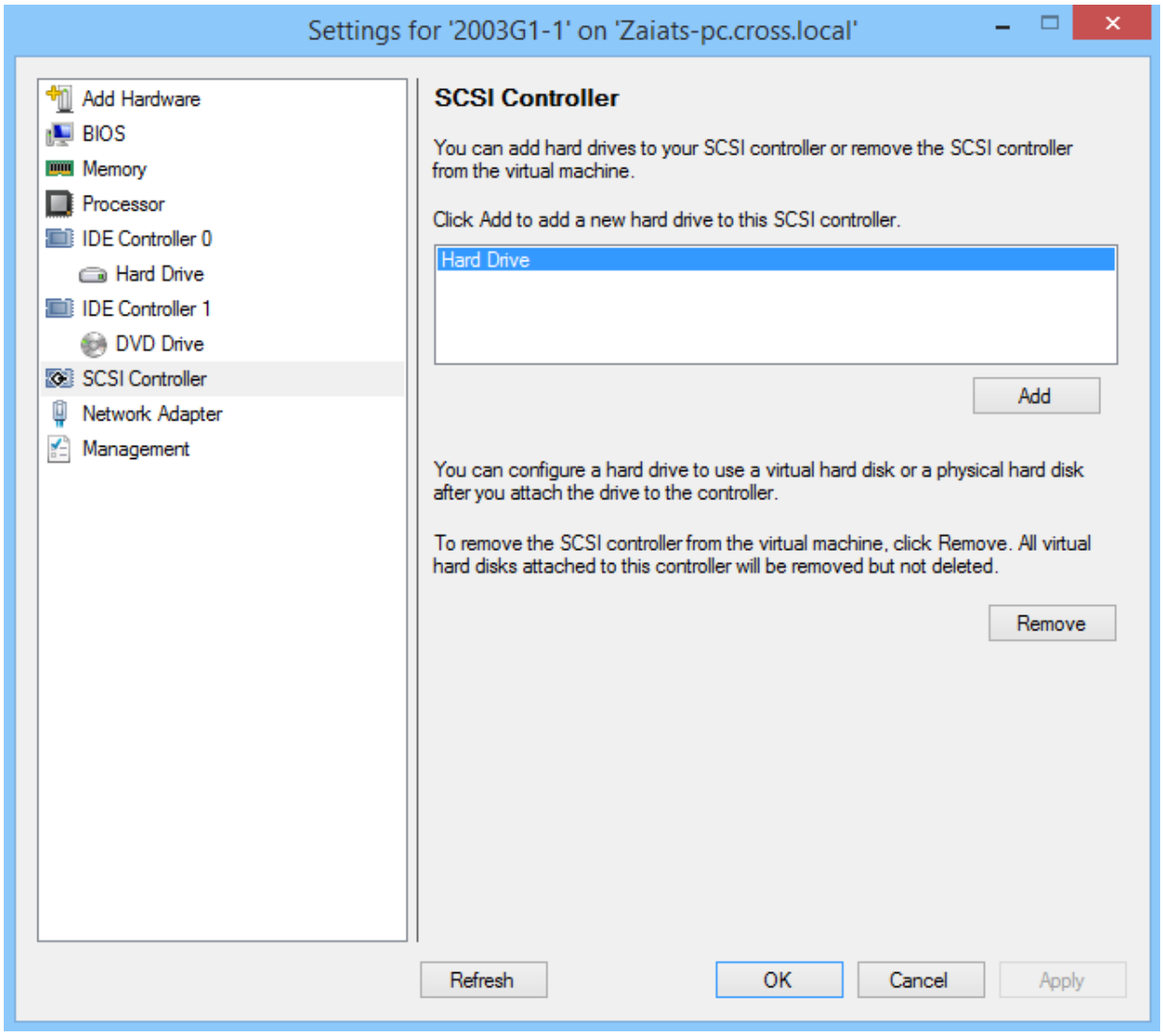
You will be redirected to the new SCSI controller or network adapter.

Configuring a SCSI controller:



Select the “Hard drive”.

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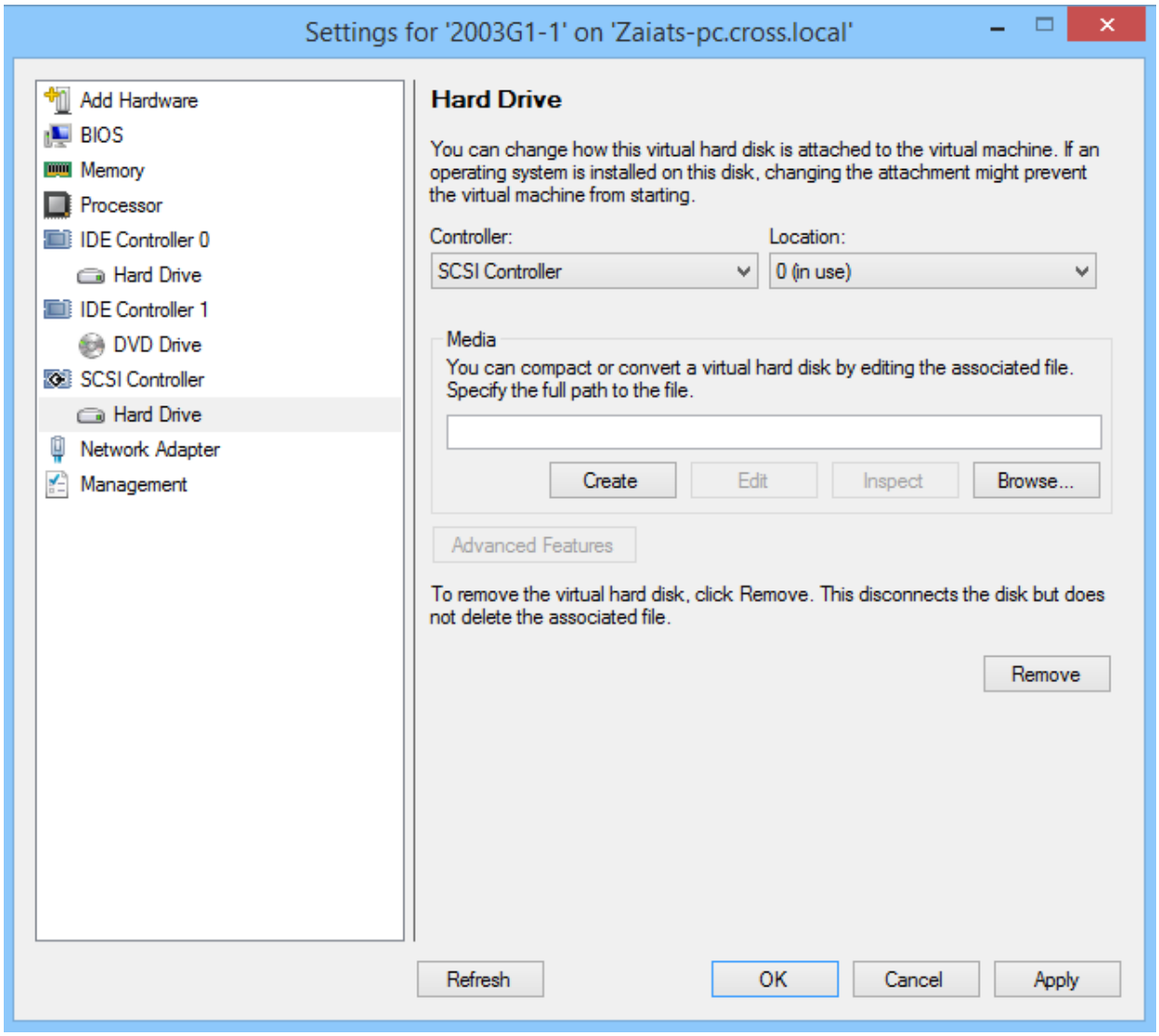
Click the **Add** button to attach virtual hard drive:



You are able to select the controller through which the new virtual hard drive will be connected to the VM; the newly added controller is set by default. If you change this value, the virtual hard disk will be immediately moved to the new controller. Select the location from 0 to 63 ("0" or "next free" if there are other HDs connected to a controller is set by default; "in use" means that this location is taken).

To add a virtual hard disk to the VM, you can either use the existing disk (and then edit it if necessary), or create a new one.

To create the new virtual hard disk, click the **Create** button to call out the **Create Virtual Disk** wizard (please refer to the "Creating a new virtual hard disk" section).

To select the existing virtual hard disk, click the **Browse** button and locate the vhd/vhdx file in the file system.

To edit the virtual hard disk, click the **Edit** button to call out the **Edit Virtual Disk** wizard (please refer to the "Editing virtual hard disk" section).

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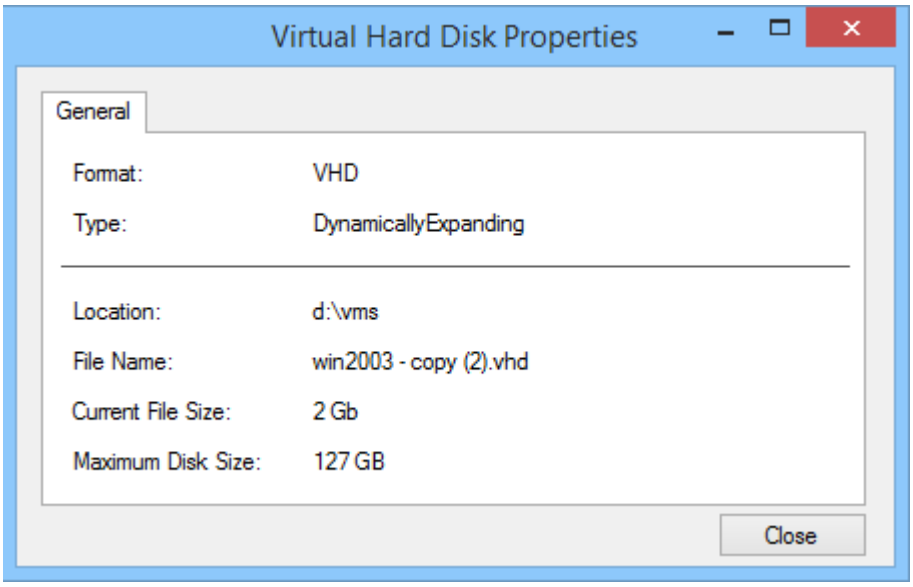
To inspect the virtual hard disk, click the **Inspect** button to get the disk information:

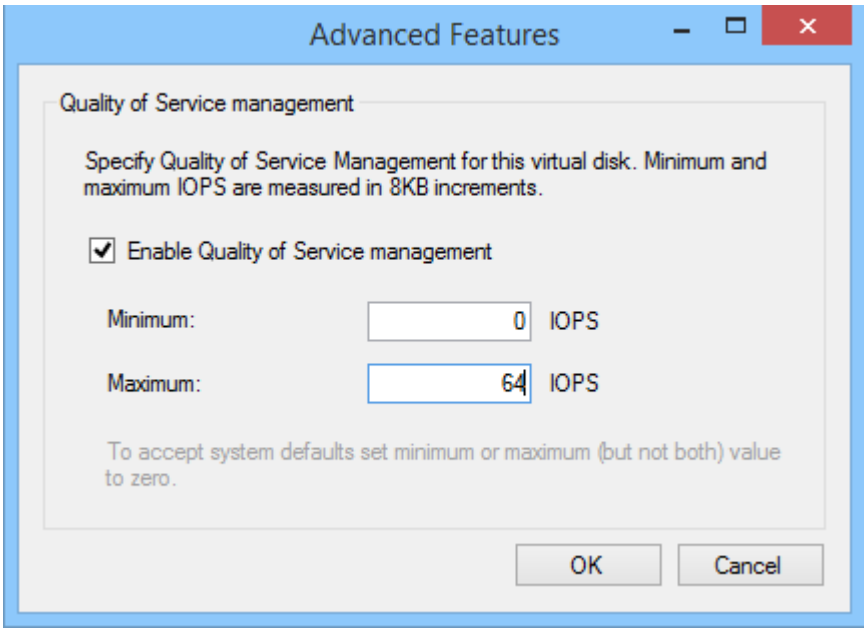


QoS management

If the VM is seated on the host and running Windows Server 2012 R2, the advanced features are available when attaching a virtual hard disk. These features consist of managing the Quality of Service by setting the minimum and maximum input/output operations per second (IOPS) for the virtual hard disk attached to the VM. To set these parameters, click the **Advanced Features** button on the wizard.

Note. The **Advanced Features** button appears on the wizard only for the hosts running Windows Server 2012 R2 since the QoS management feature applies to these hosts only.

The **Advanced Features** dialog will appear:



Tick the **Enable Quality of Service management** box to enable this feature and set minimum and maximum IOPS in 8 KB increments.

To remove (disconnect) a virtual hard disk from the VM, click the **Remove** button.

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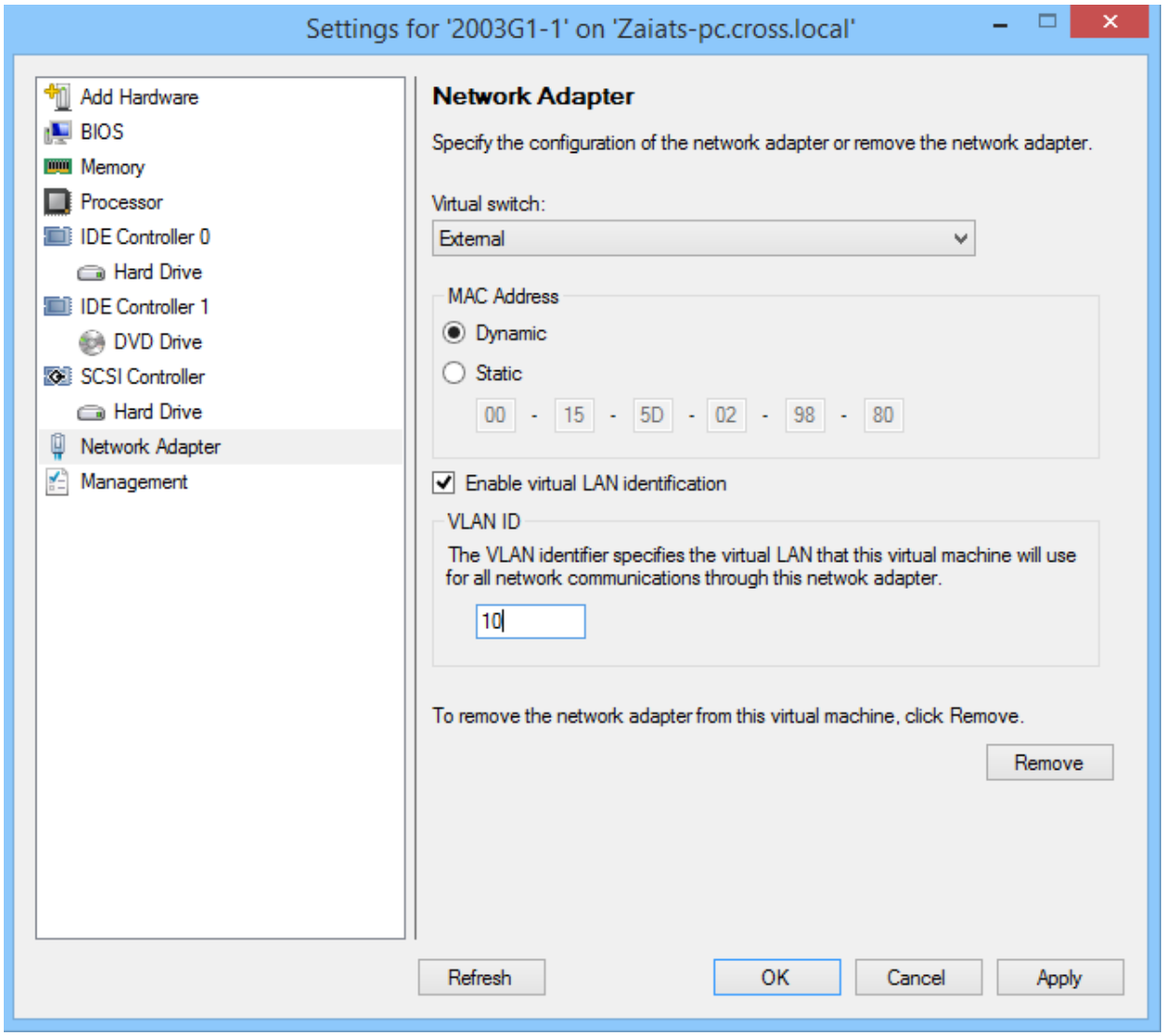
Configuring a virtual network adapter:



- Select the necessary virtual switch to connect the VM to from the list (please refer to the "Virtual network configuration" section to find out how the Hyper-V virtual switch is created);
- Select MAC address obtaining option – **Dynamic** to set the virtual NIC physical address dynamically, or **Static** – and enter the MAC address manually (the default value is present);
- Tick **Enable virtual LAN identification** and then enter the VLAN identifier (number) if the VM is supposed to use VLAN for all network communications through this virtual network adapter.

To remove the virtual network adapter from the VM, click the **Remove** button.

Fibre channel adapter

5nine Manager for Hyper-V supports Fibre channel adapter.

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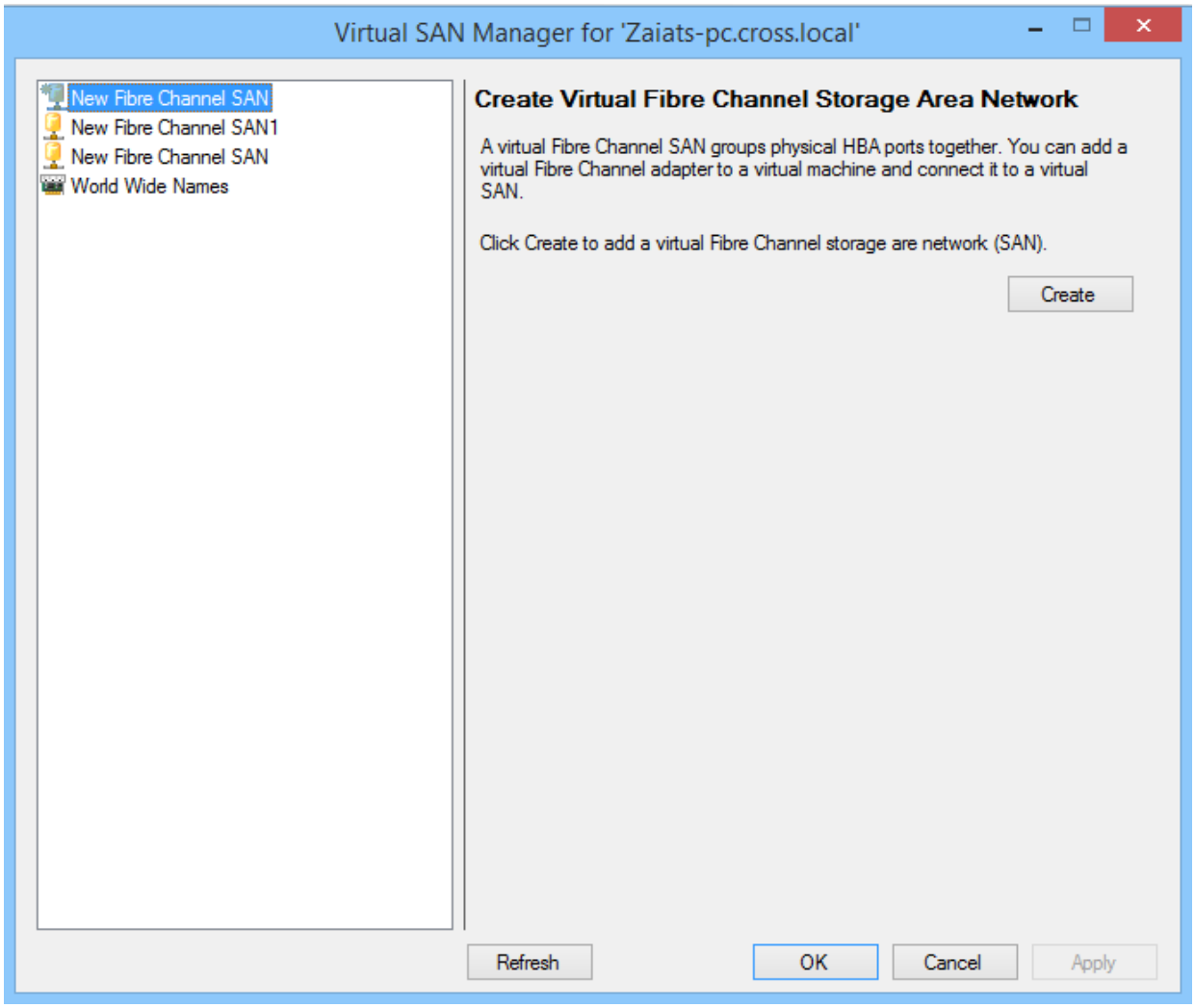
To open the Virtual SAN Manager menu press the  (**Virtual SAN Manager**) button on the main panel menu.



To create a New Fibre Channel SAN, press the **Create** button.

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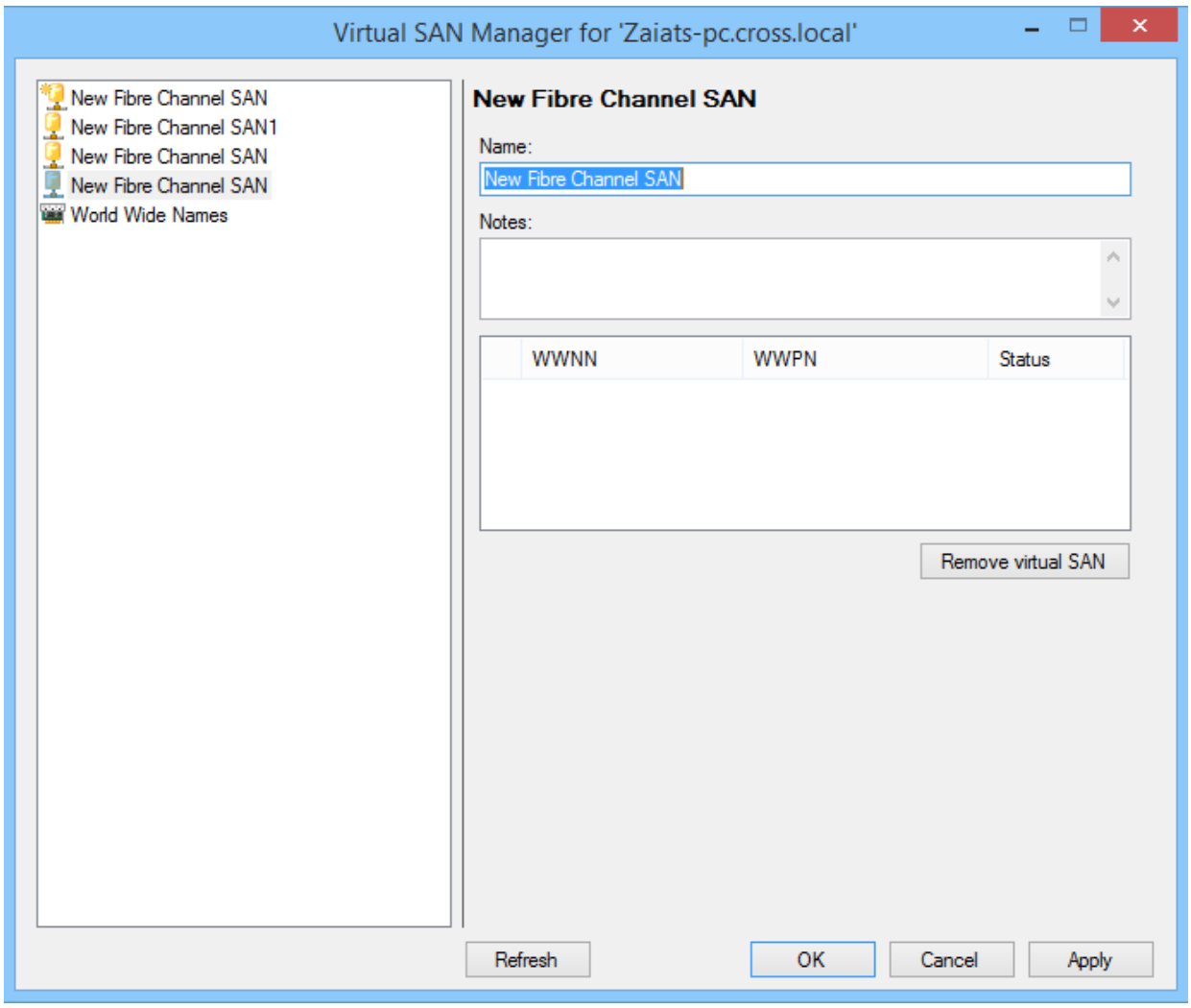

Here you can change name of the Fibre channel adapter, and remove virtual SAN. Press **VM settings** and add Fibre Channel Adapter to your VM.

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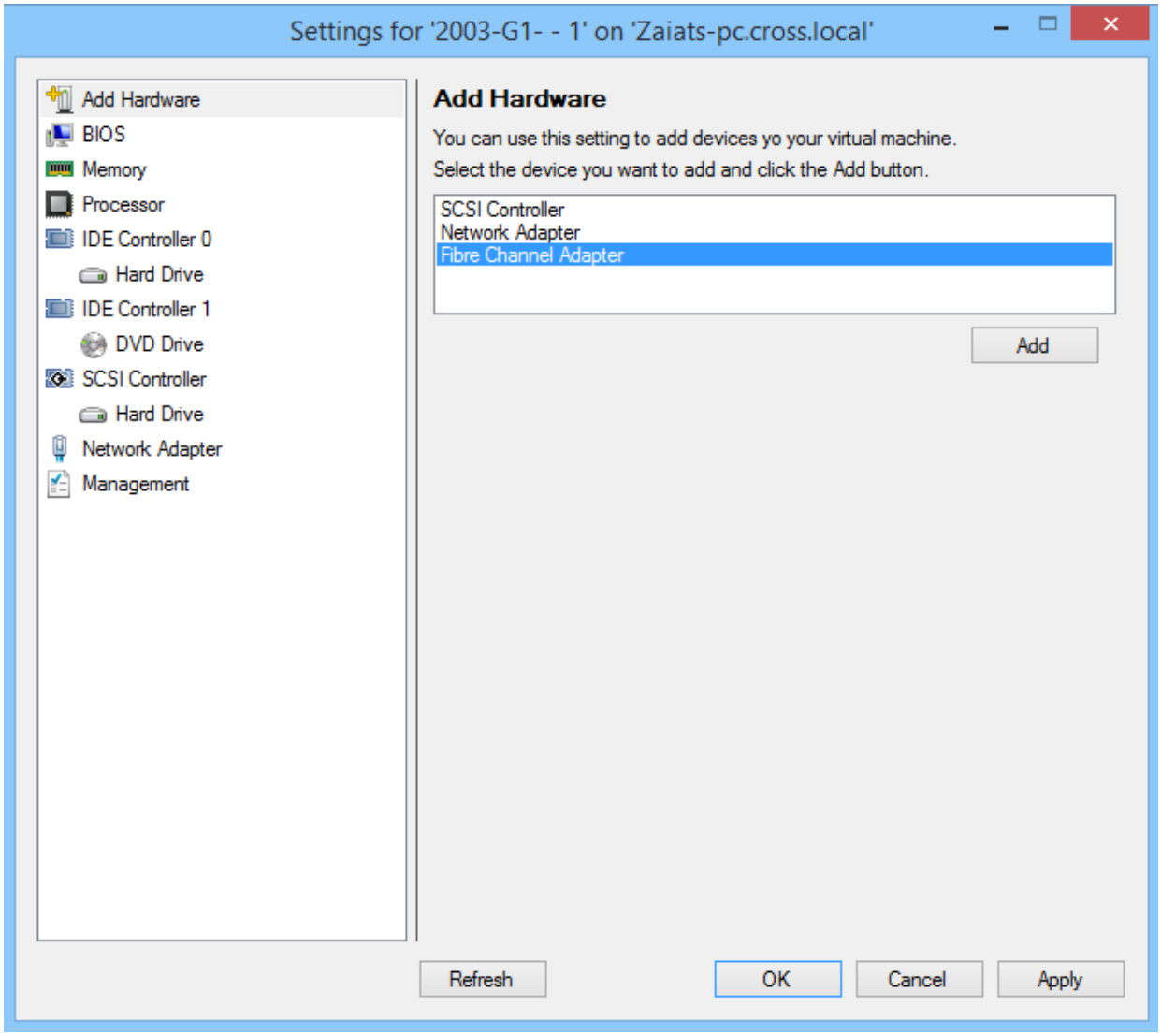

Click the **Add** button to attach the Fibre channel adapter SAN for your VM. Now you can choose Virtual SAN for your VM.

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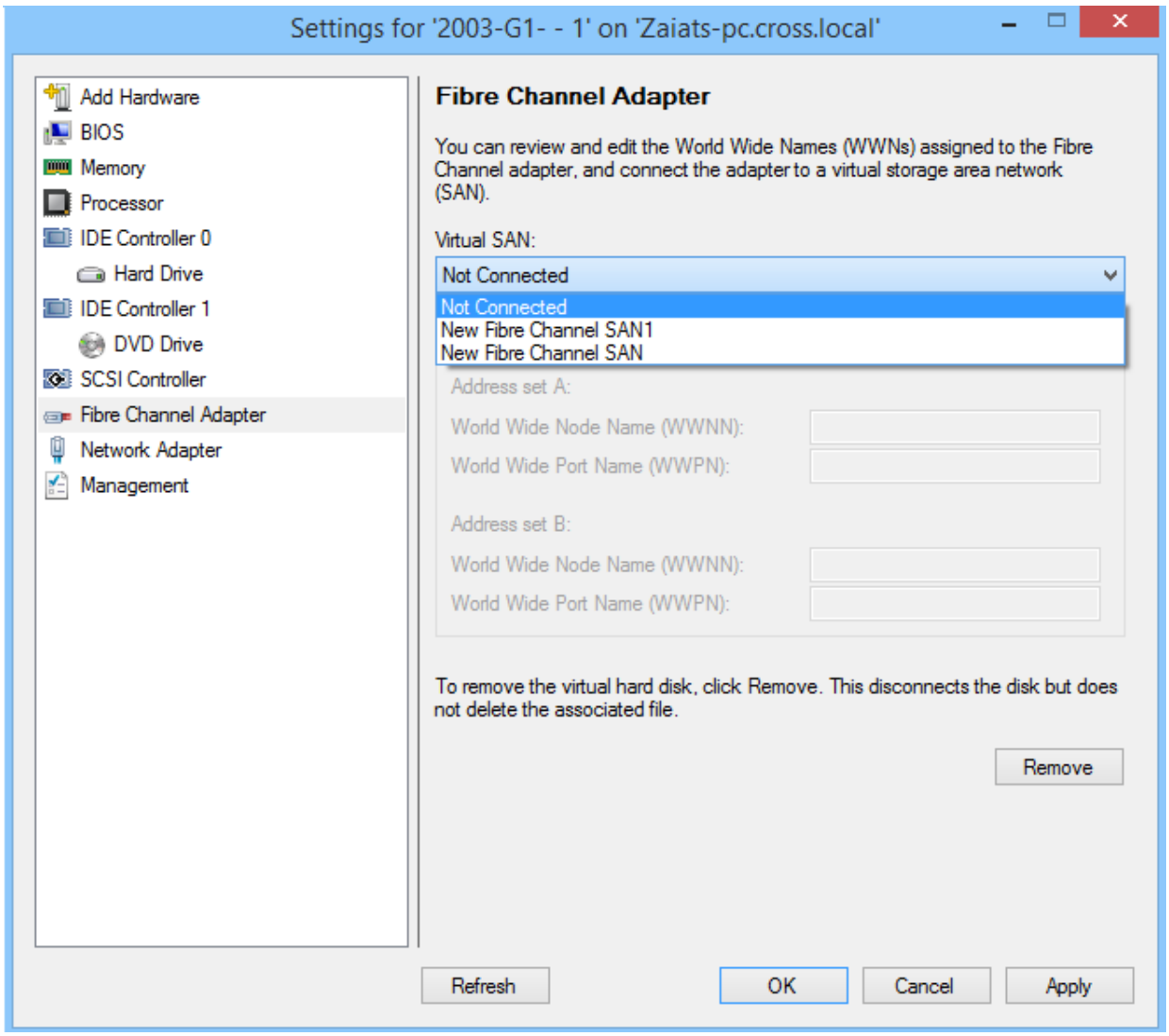

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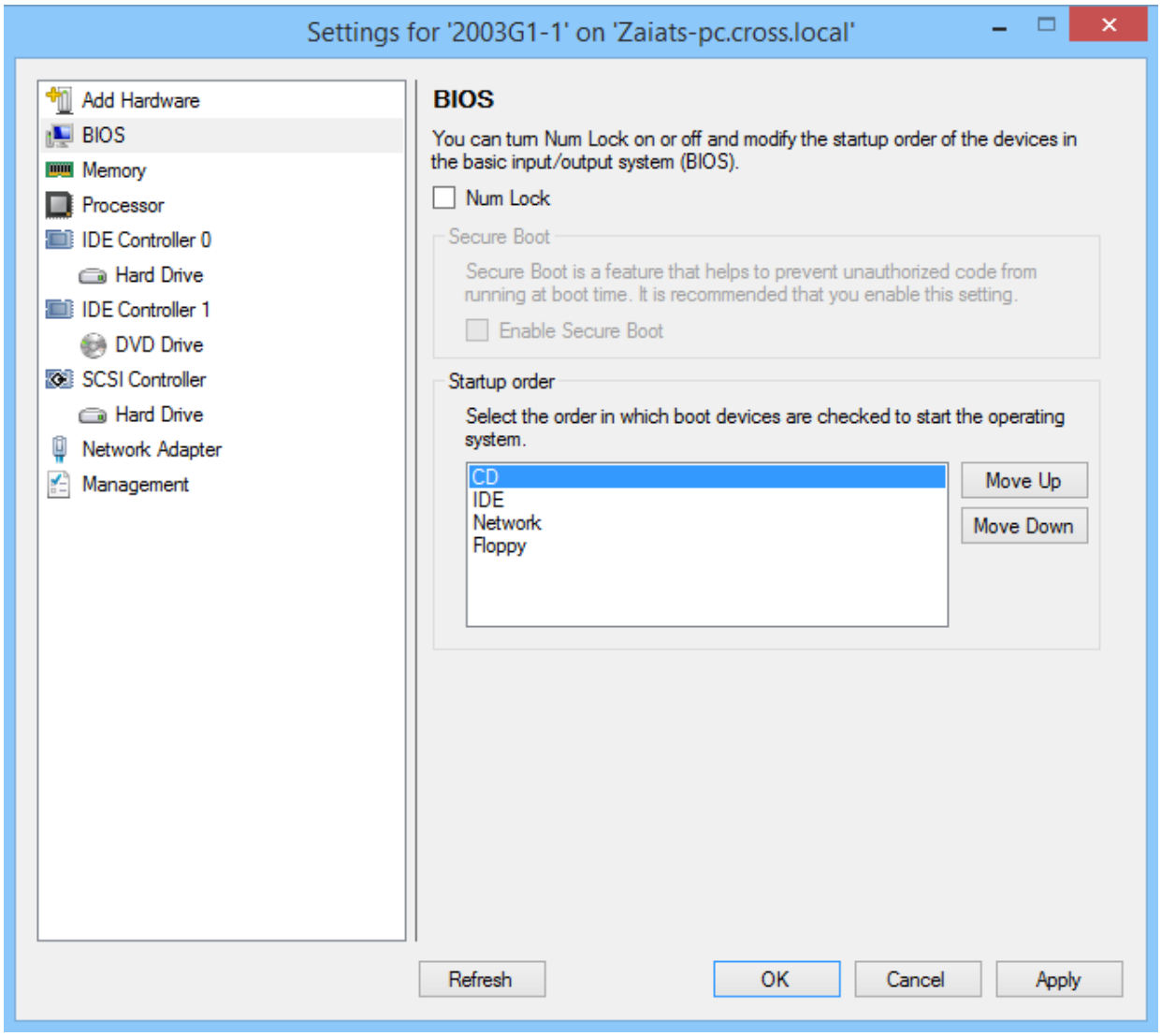
On the "BIOS" branch, set the BIOS parameters for the VM:



- Tick the **Num Lock** box to turn the Num Lock on in the VM basic input output system;
- Set the order in which boot devices will be checked to start the OS. Select the device and click the **Move Up** or **Move Down** button to move the device up or down the list accordingly.

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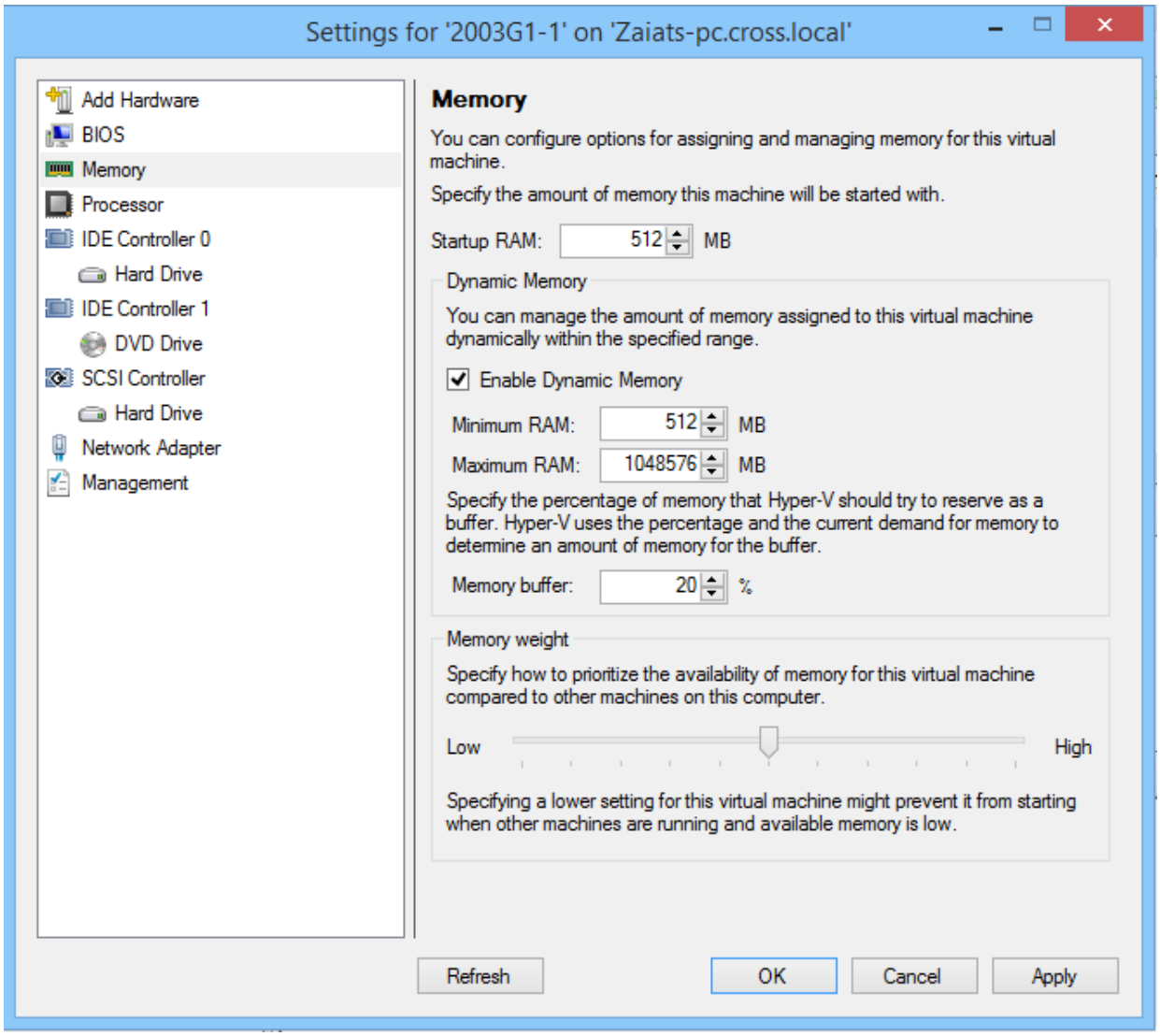
On the “Memory” branch, set the virtual memory parameters: startup RAM, whether the RAM is statically or dynamically allocated, minimum and maximum value for dynamic option, memory buffer share in percent and memory weight on the host:



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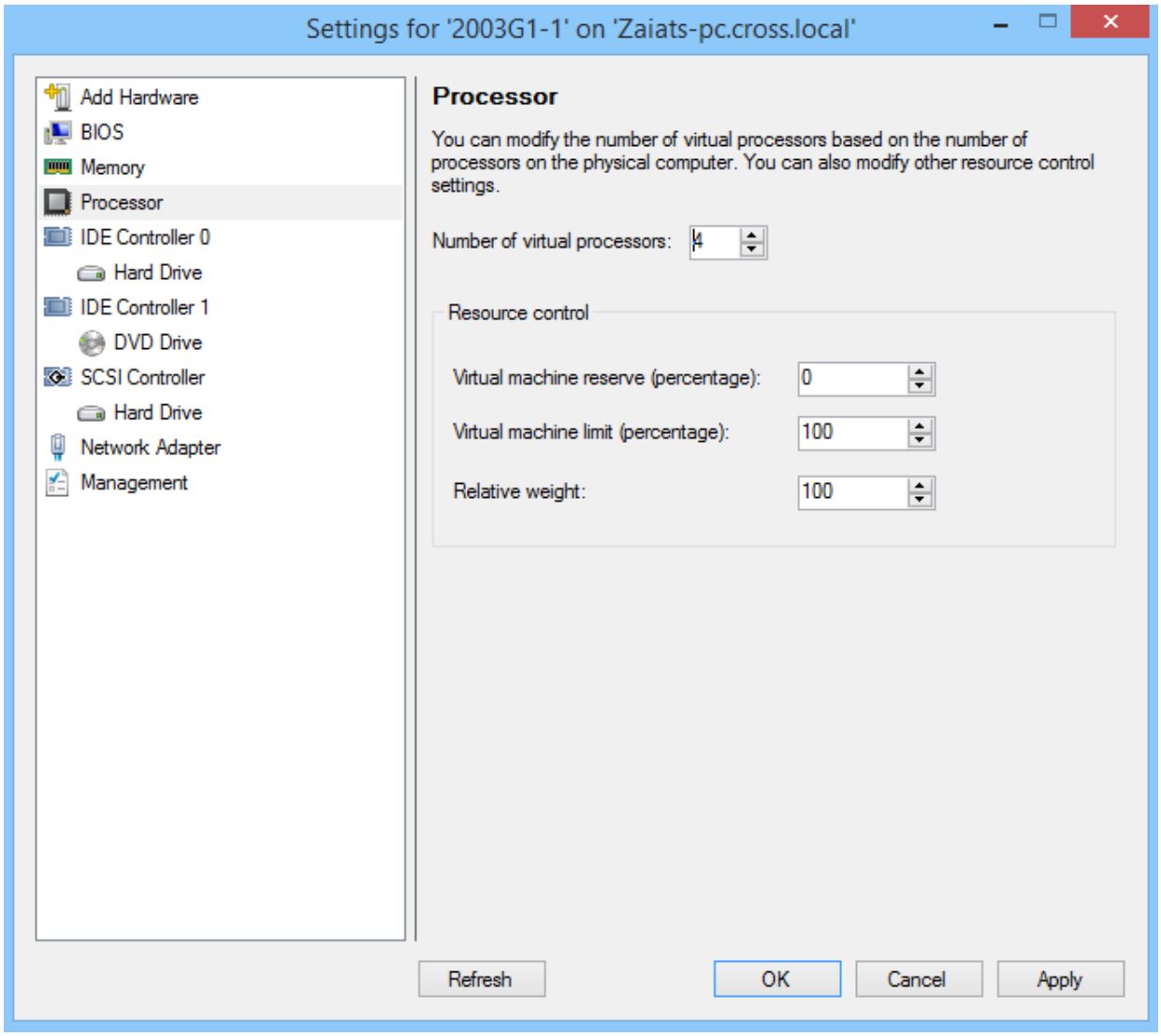
On the “Processor” branch, set the virtual processor parameters: the number of virtual processors used for the VM and host physical resources control parameters (reserve, limit and relative weight):



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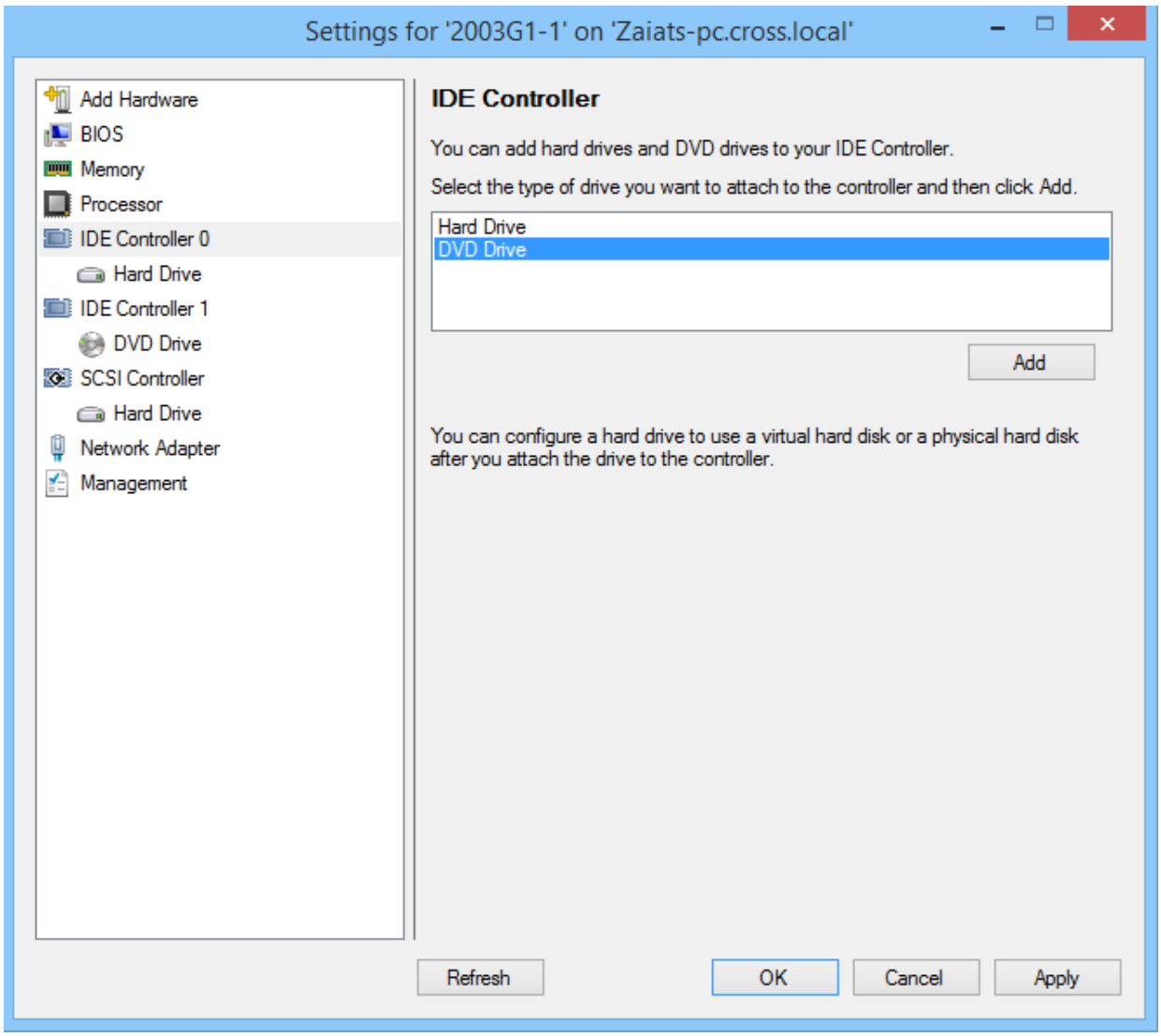
On the "IDE Controller" branch, you also can add either virtual hard drive or DVD drive:



Select the DVD Drive to add the new DVD drive to the VM and click the **Add** button.

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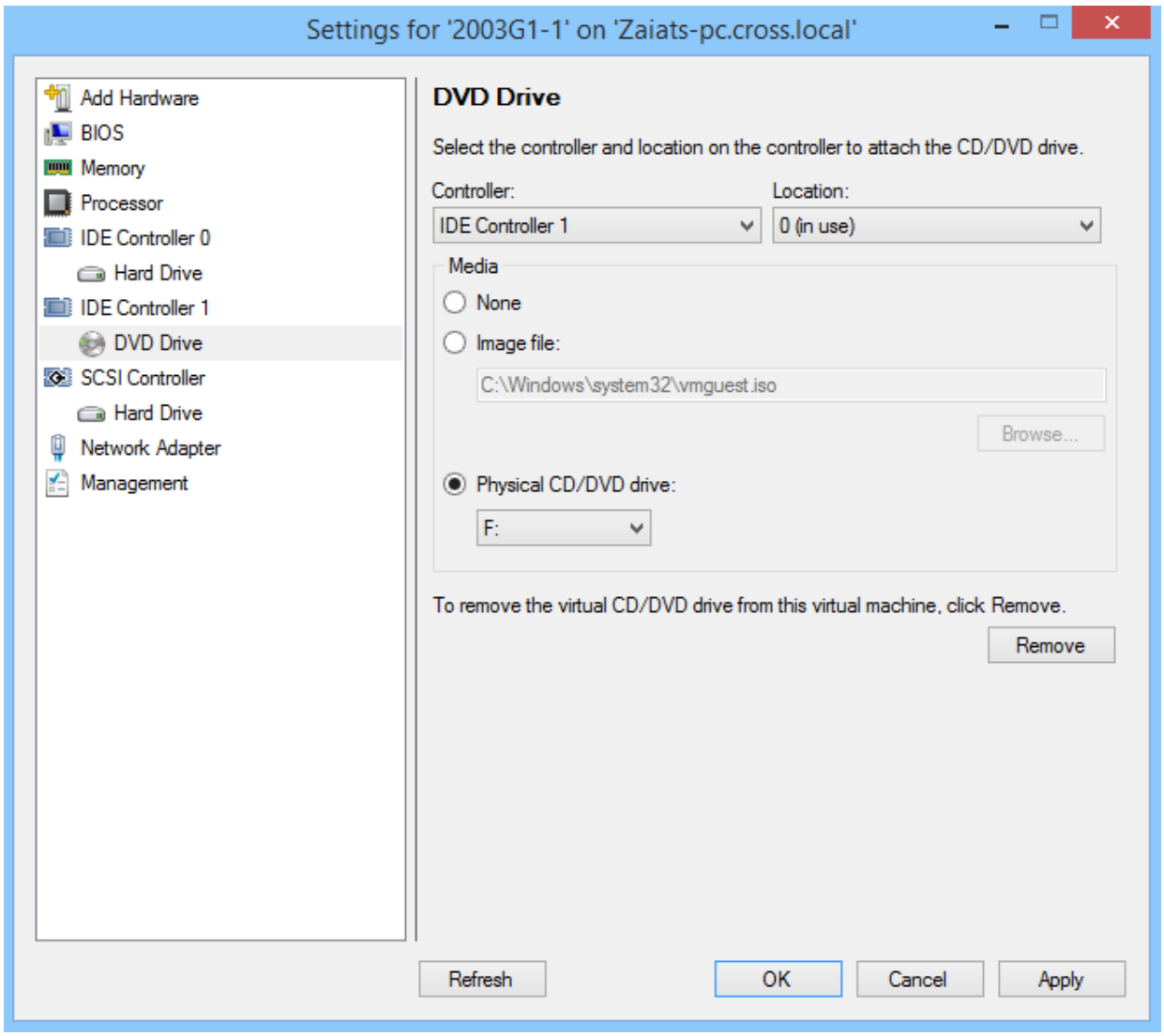
Configure the DVD drive:



You are able to select the controller through which the DVD drive will be connected to the VM; the newly added controller is set by default. If you change this value, the DVD drive will be immediately moved to the new controller. Select the location from 0 to 63 ("0" or "next free" if there are other HDs connected to a controller is set by default; "in use" indicates that this location is taken).

Select the media type from which the DVD will be connected:

- **None** – no media will be used;
- **Image file** – select the *.iso* file to use as an image for DVD drive. You will have to locate the file by clicking the **Browse** button and choosing the path to the *.iso* file;
- **Physical CD/DVD drive** – to use the physical CD or DVD drive available on the host;

To remove the virtual DVD drive from the VM, click the **Remove** button.

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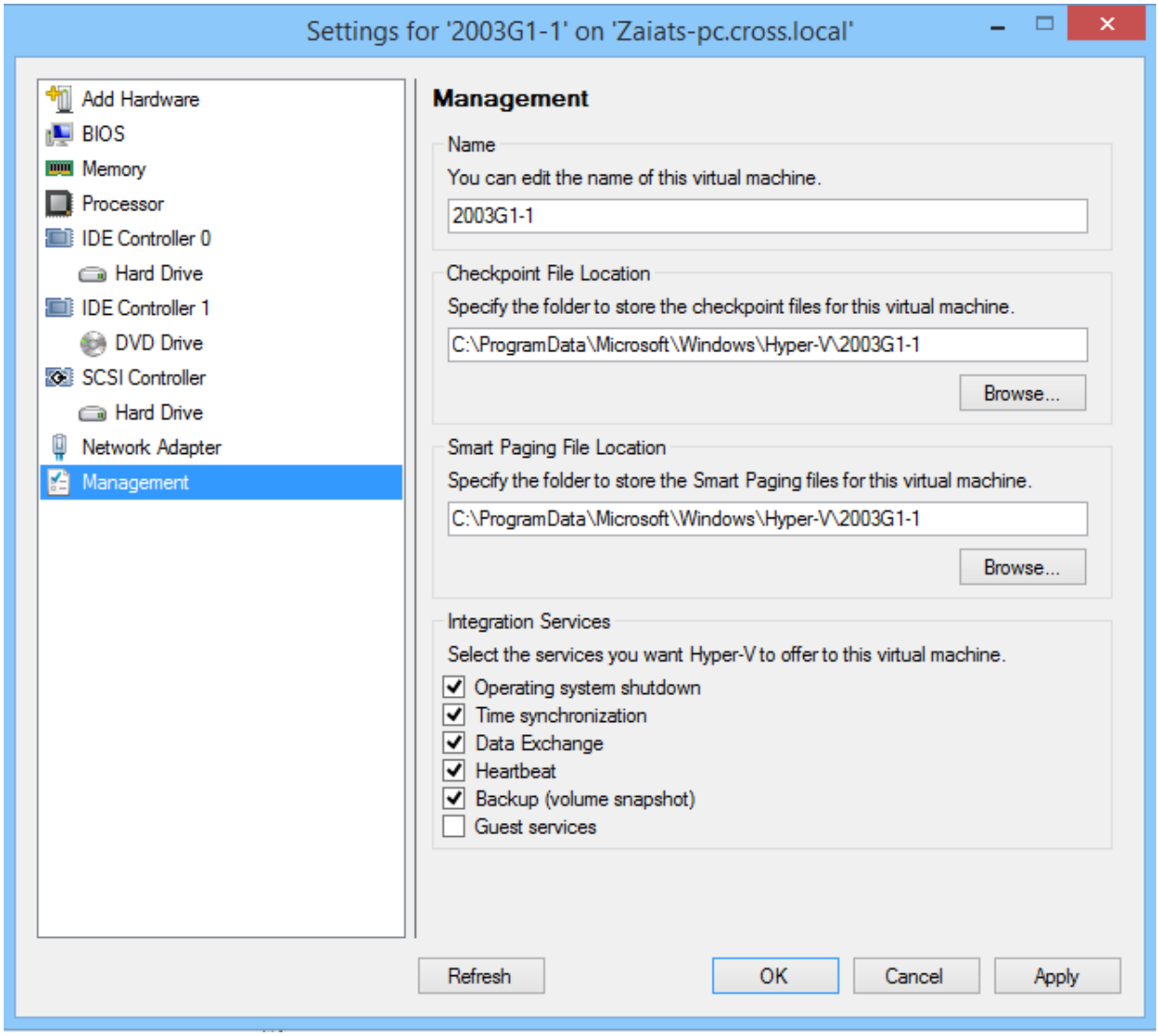
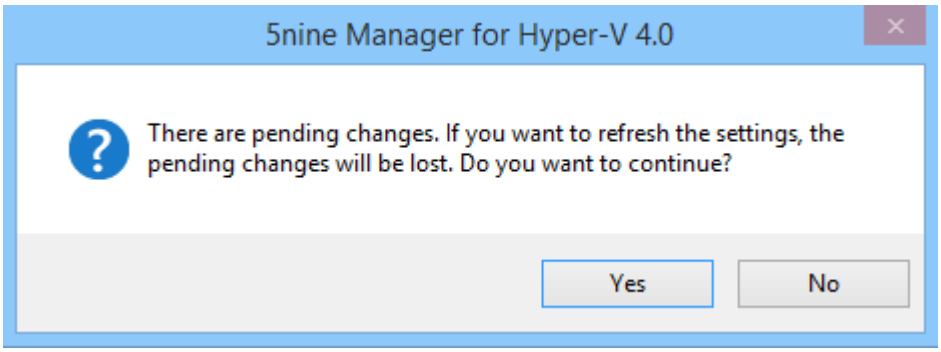
On the "Management" branch, set the integration services for the virtual machine:



Select the necessary integration services options to be applied to the VM as shown. The **Refresh** button will update the entire information for the VM. If there were any unsaved changes, this warning will appear:



At the end, click **Apply**, then click **OK** to exit the wizard.

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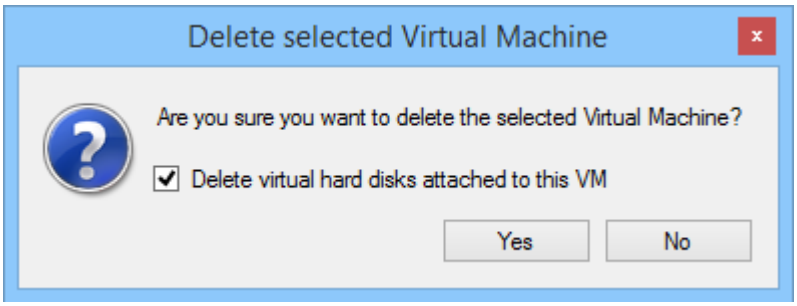
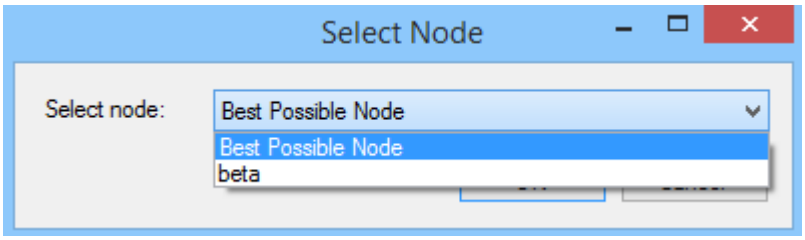
- Delete. To delete the VM, you have to turn it off first. Then the **Delete** button becomes available on the **Hyper-V Manager** tab menu panel. Click it and confirm the operation:

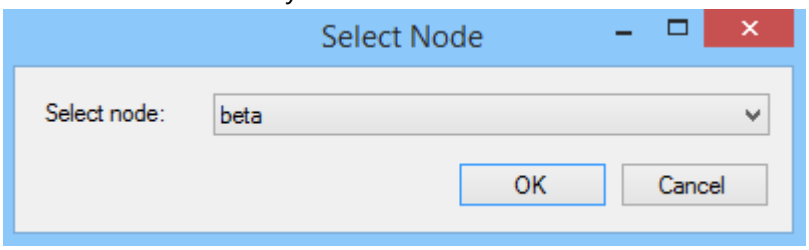


You can either delete virtual hard disks attached to this VM or leave them untouched.

- Move (this action applies to clustered VMs and is available only in the full version of 5nine Manager for Hyper-V. This requires purchasing and installing the license as described in the "Licensing" section). To move the VM between nodes that joined into cluster, first select the cluster in the 5nine Manager for Hyper-V object tree, and then select the VM that you need to move to another node and click the **Move** button on the **Hyper-V Manager** tab menu panel.



Select either "Best possible node" so that the system will choose it automatically or select the exact node you would like the VM to be moved to and click **OK**:



- Remove From Cluster/Add To Cluster (this action applies to clustered VMs).
To remove a clustered VM from cluster, select the cluster in the 5nine Manager for Hyper-V object tree, and then select the VM that you need to remove from cluster and right click on it. Select the **Remove From Cluster** option.

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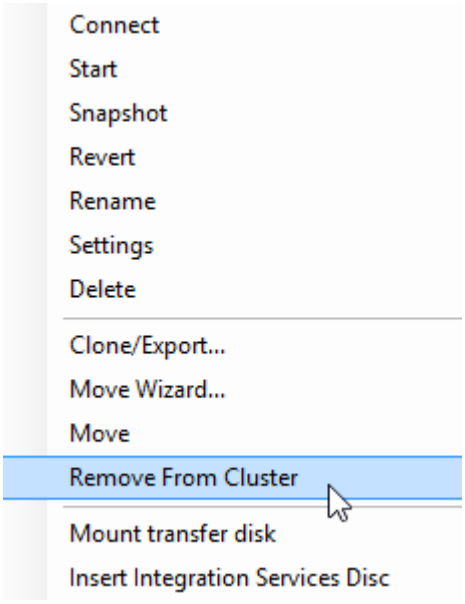
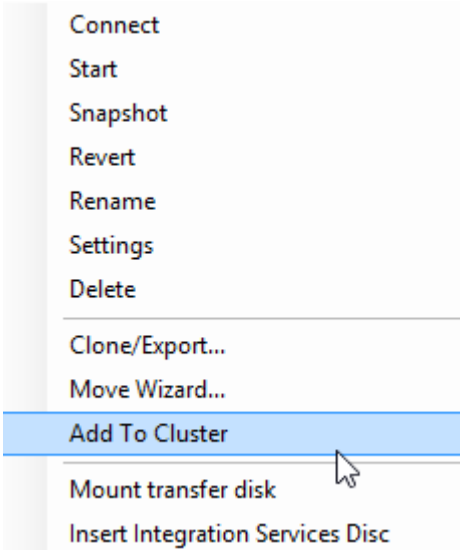


If you want add a VM to cluster, select the **Add to Cluster** option.



- Move Wizard. To open **Move Wizard** you must select a VM, then press the  button, or right click on **VM** and select **Move Wizard**.

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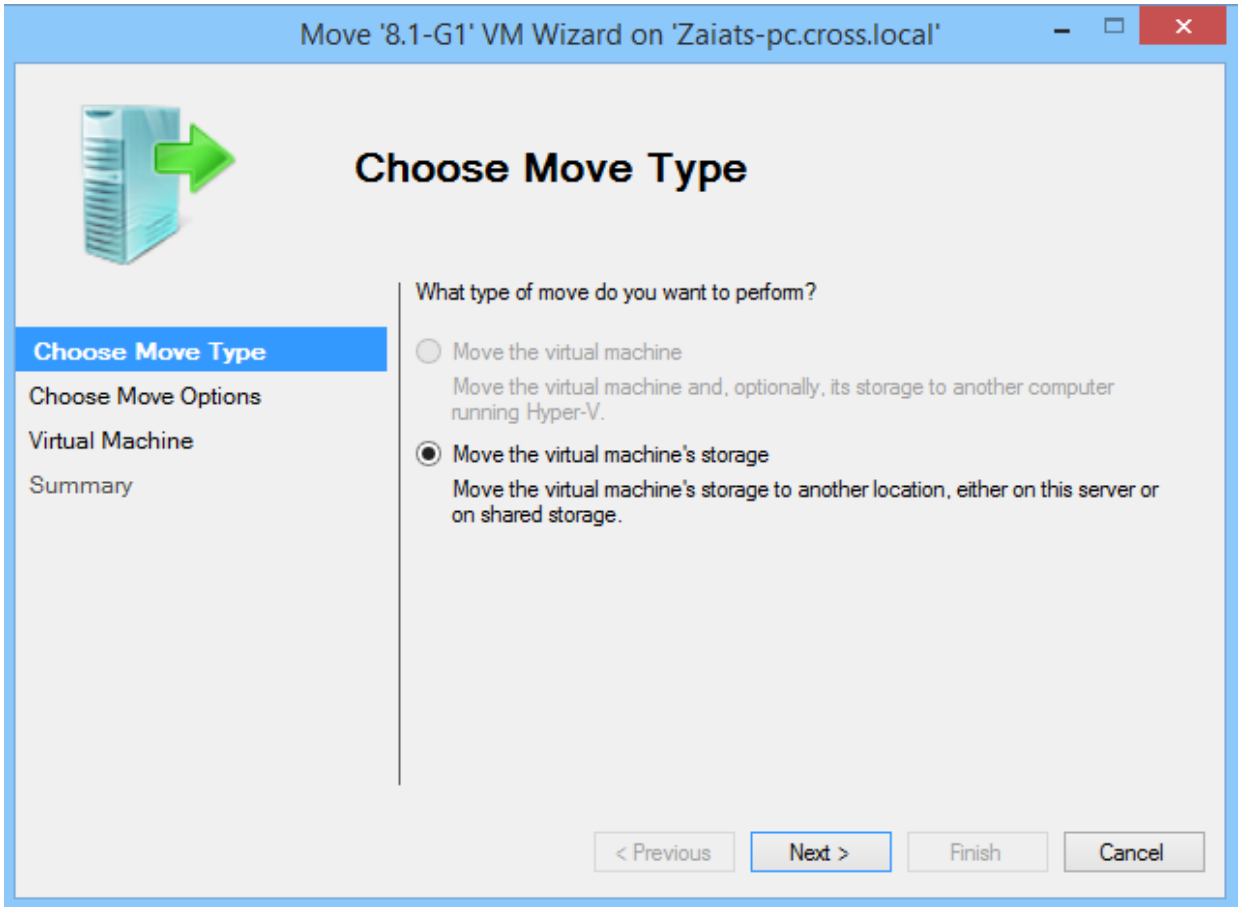

You can **Move the virtual machine** or **Move the virtual machine's storage** here. Once you make your selection, press the **Next** button.

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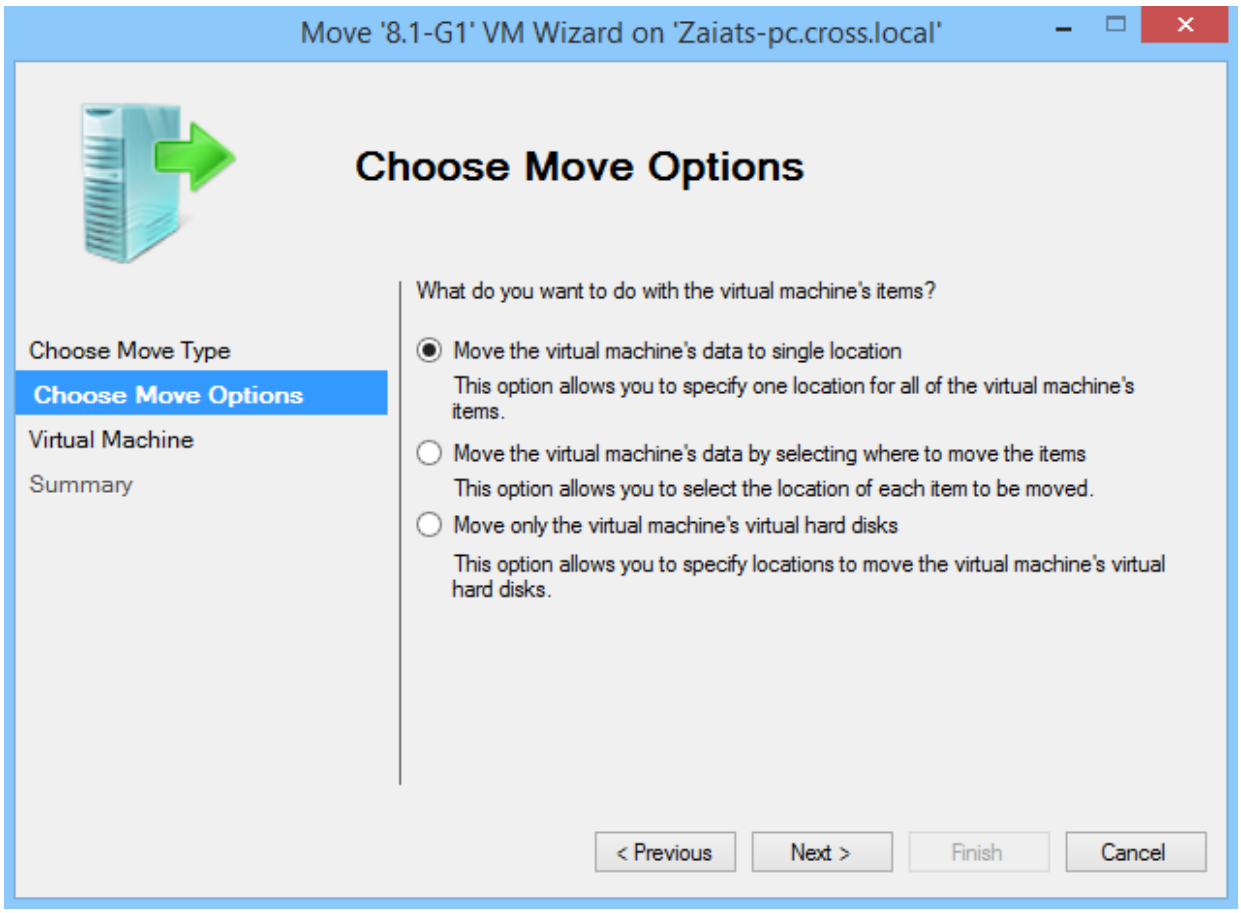

In the **Choose Move Options** tab you can choose one of several options:

- Move the virtual machine's data to a single location (this option allows you to specify one location for all of the virtual machine's items).
  When you press the **Next** button, you must choose a folder for Destination location.

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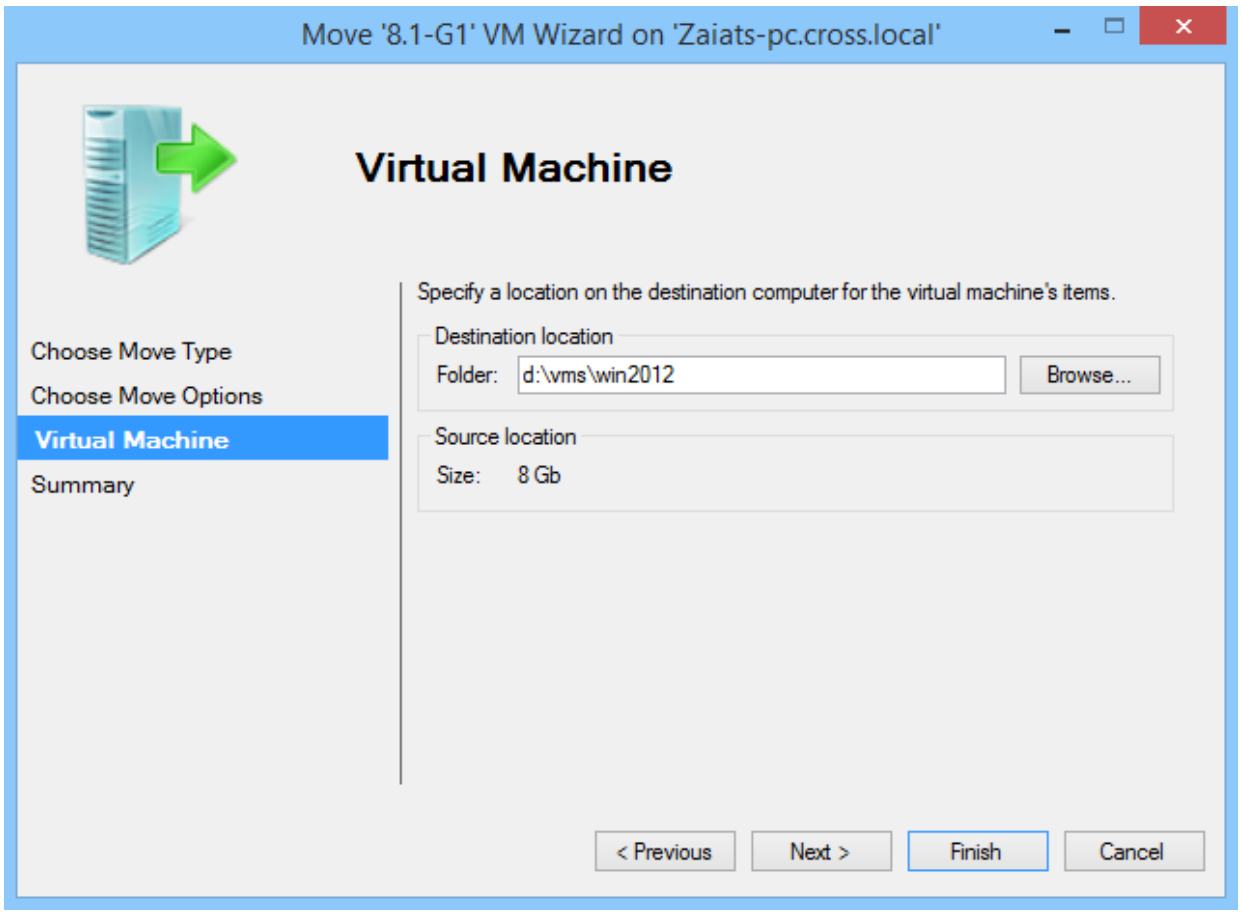

- Move the virtual machine's data by selecting where to move the items.
  (This option allows you to select the location of each item to be moved).
- Move only the virtual machine's virtual hard disks (This option allows you to specify locations to move the virtual machine's virtual hard disks).
  When you press the **Next** button, you must choose **Items to Move**.
  In the **Specify New Locations** tab, you must choose new locations for the items.

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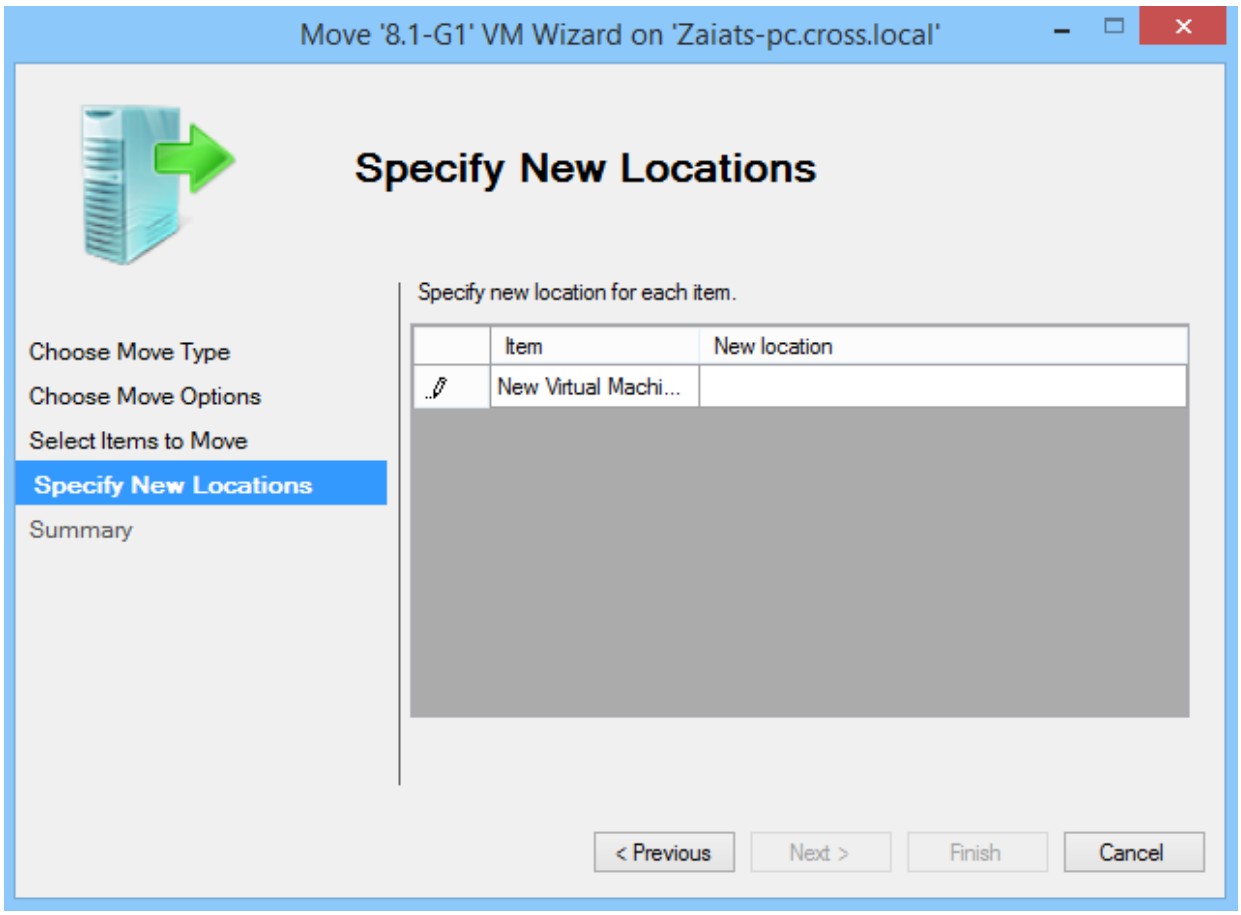

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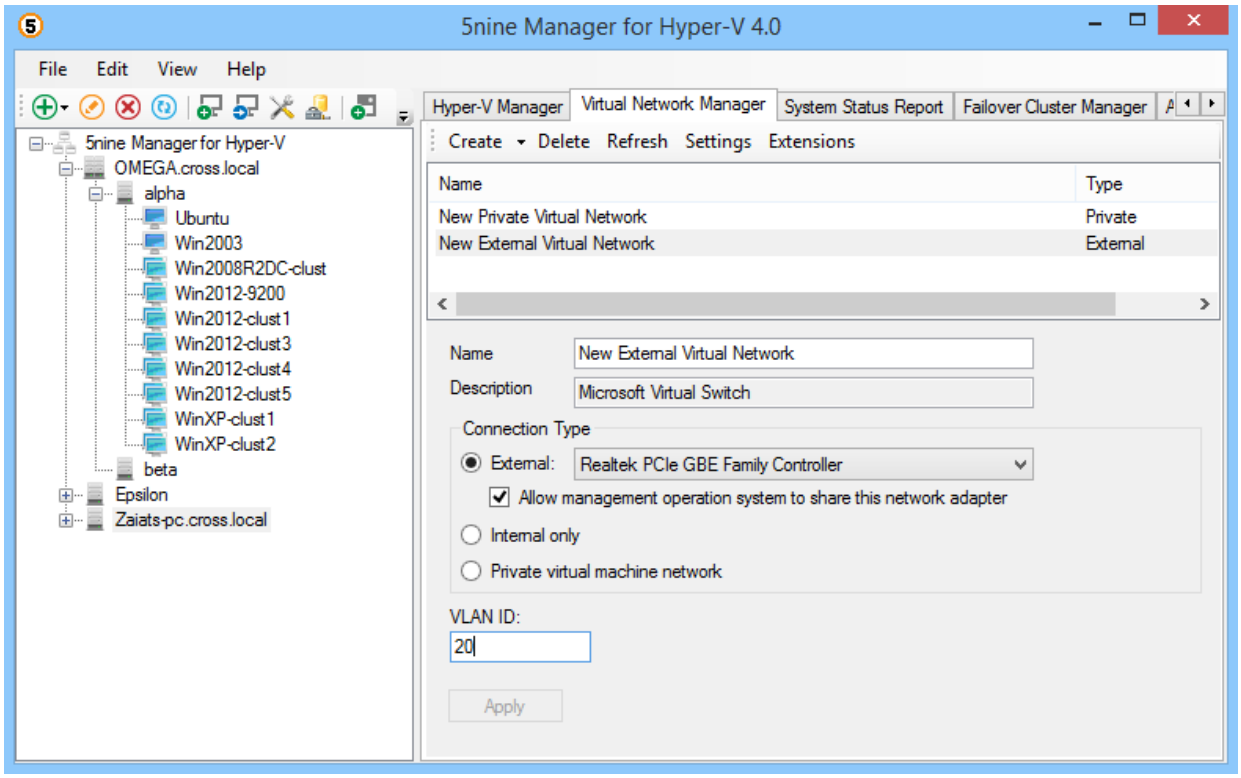
Virtual network configuration

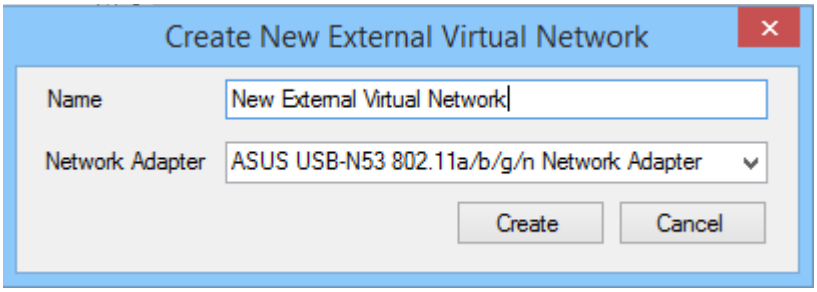
Attention! Please configure virtual network prior to VM creation.

To configure virtual network switches, use the **Virtual Network Manager** tab. This tab is active when a host is selected in the object tree:



To create a new virtual switch, use one of **Create** menu commands:

- **External**. In this type of virtual network connection, one of the physical NICs installed on the host is used to connect the VMs to the network. Enter the network name (the default value is "New External Virtual Network") and select the network adapter to use for this connection in the following dialog. Click the **Create** button:



- **Internal**. In this type of virtual network connection, neither of the physical NICs of the host is supposed to be used for VMs that will be using this connection. VLAN can be set for this connection so that you are able to create multiple VLANs within your internal virtual network (a separate connection should be configured for each VLAN accordingly).

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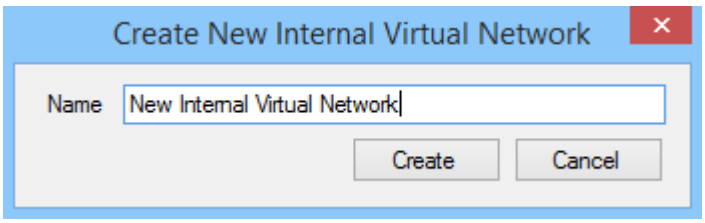
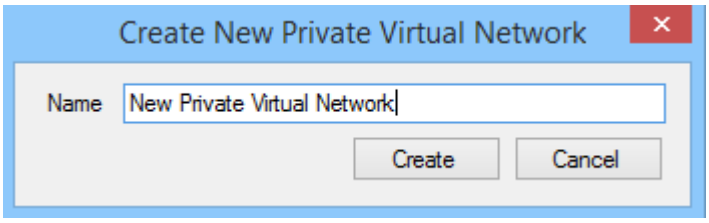
Enter the network name in the following dialog and click the **Create** button:



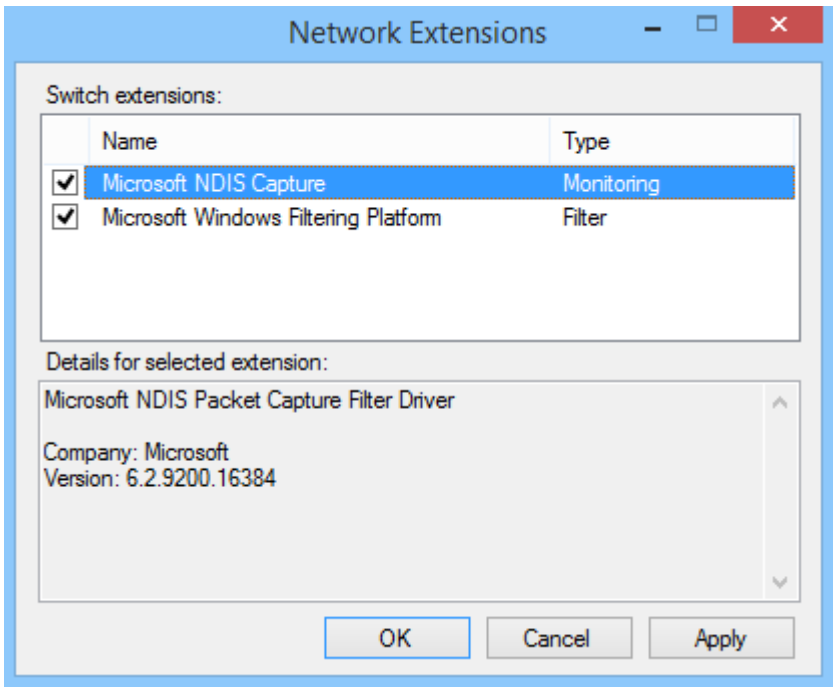
- **Private**. In this type of virtual network connection, neither of the physical NICs of the host is supposed to be used for VMs that will be using this connection, nor the VLANs could be set for it.
  Enter the network name in the following dialog and click the **Create** button:



Upon completing the operations described above, you will see the new network connections on the **Virtual Network Manager** tab and will be able to alter them in any way, including: changing name, type, select the new NIC and change VLAN. Click the **Apply** button to save the changes.

Virtual Switch extensions can be turned on/off in the Network Extensions window.

Press the **Extensions** button to change extensions settings.



Note. Remember that VMs belong to different VLANs and will not be able to communicate with each other without using a layer 3 device, such as a router, to establish inter-vlan routing. Contact your network administrator for the assistance if any problems occur at this point.

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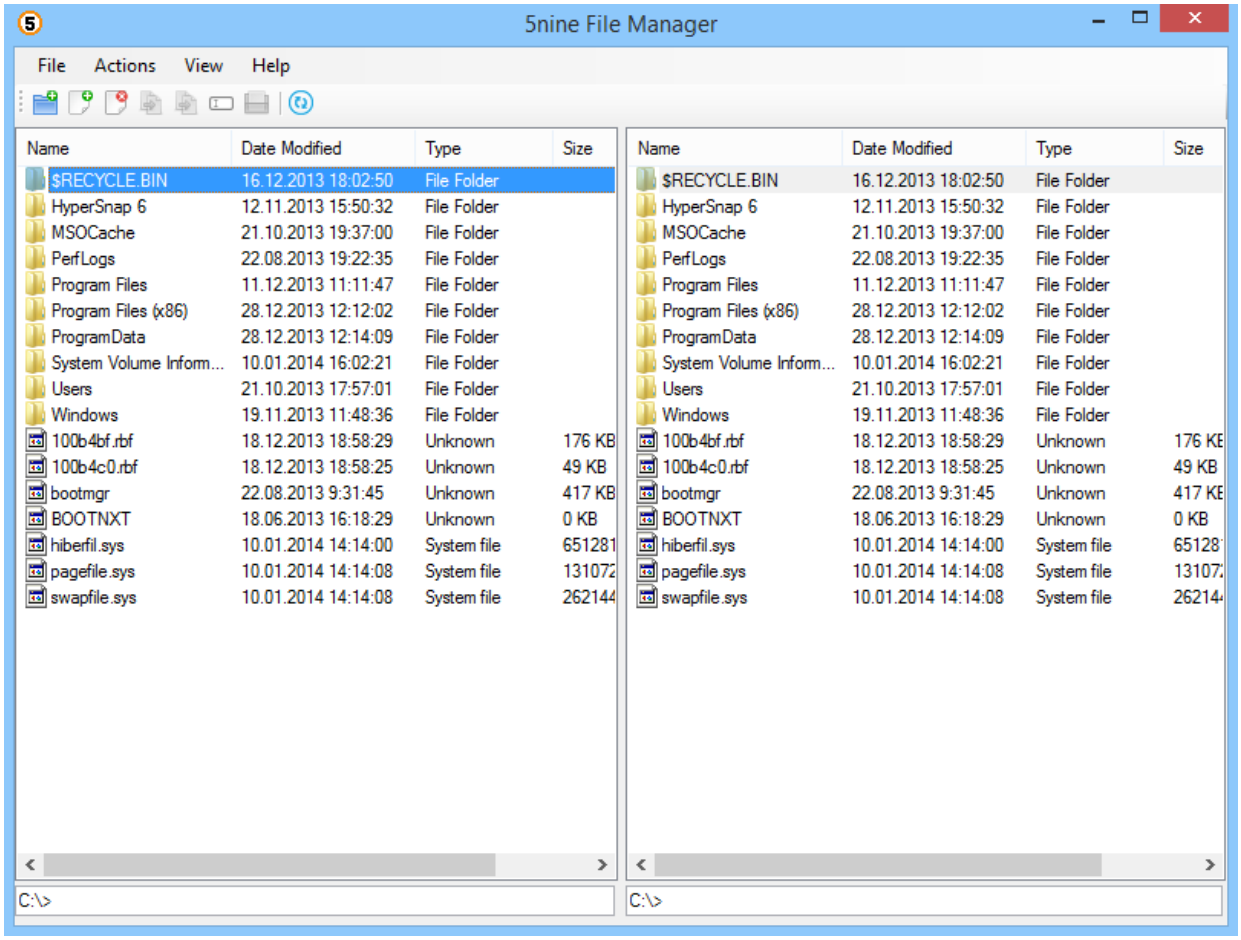
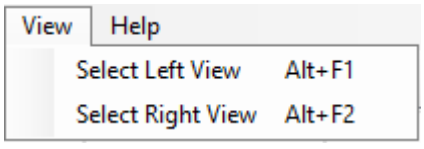
Using file manager

5nine Manager for Hyper-V includes a simple 2-pane file manager. To start 5nine Manager for Hyper-V File Manager press the button or use the **View** → **File Manager** menu command.



To access different partitions in 5nine Manager for Hyper-V File Manager use the **View → Select Left/Right View** menu command.



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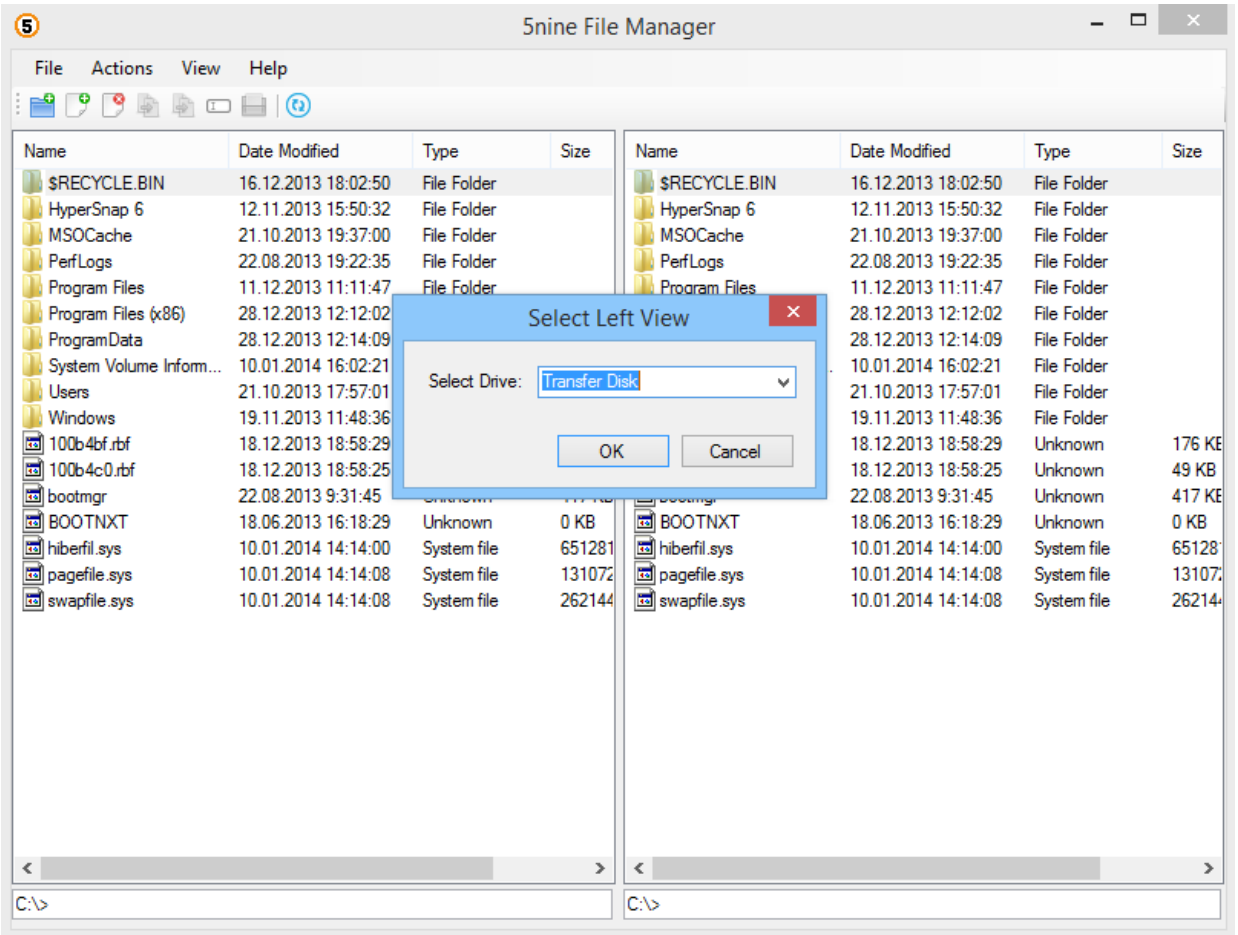
Working with transfer virtual disk. Copying files between VMs or between VM and host

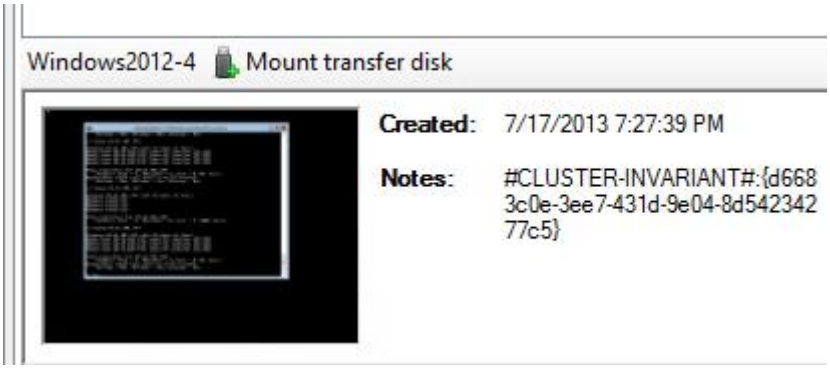
5nine Manager for Hyper-V provides the capability to copy files from VM to VM, and from VM to host. This feature works only on the host where 5nine Manager for Hyper-V is installed. It is implemented through a special built-in transfer virtual hard drive.

To copy files from host to a VM, follow these steps:

1. Copy necessary files in 5nine Manager for Hyper-V File Manager.



2. Mount the transfer disk to a VM where it is necessary in order to copy files. Go to the **Hyper-V Manager** tab, select the necessary VM and click the **Mount transfer disk** button:



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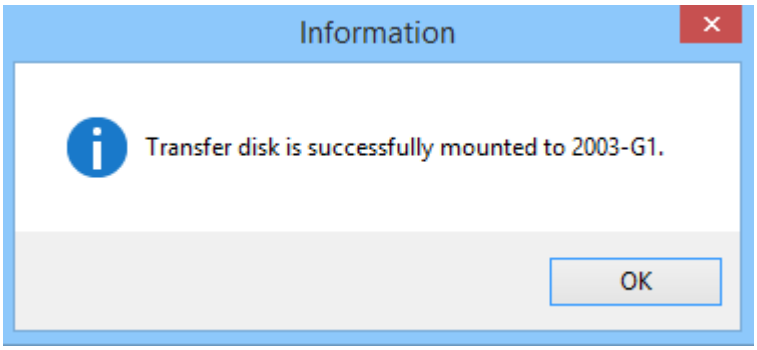
The following message will appear in the case of successful disk mount:



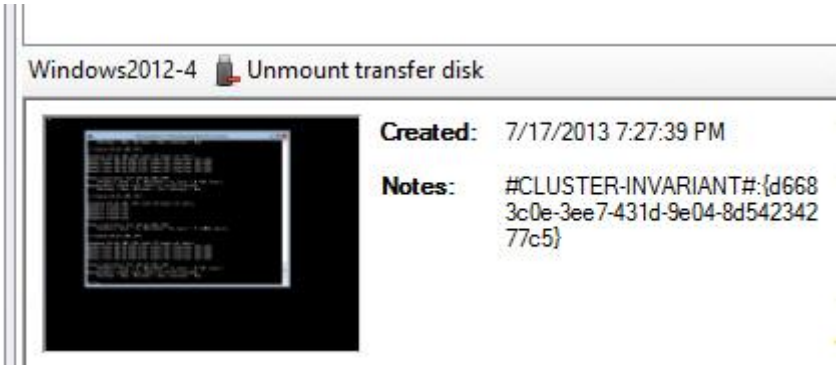
Note. It is only possible to mount the transfer disk to one of the VMs on the local host. When an attempt to mount the transfer disk to the VMs on the remote host is done, the system will warn you:

3. Connect to the VM via guest console and copy files to VM. If it is the first time the virtual disk is used with this VM, make it online using the Disk Management tool from the Computer Management utility in the guest OS.

Attention! Transfer disk can only connected to one VM at this time. When the transfer disk is connected to a VM, it cannot be accessed via File Manager. The opposite is also true. Release the transfer disk prior to moving it to another place.

To release the transfer disk when it is in use in the file manager, select another disk on the file manager pane where the transfer disk is opened.

To release the transfer disk when it is mounted to a VM, go to the **Hyper-V Manager** tab, select the VM and click the **Unmount transfer disk** button:



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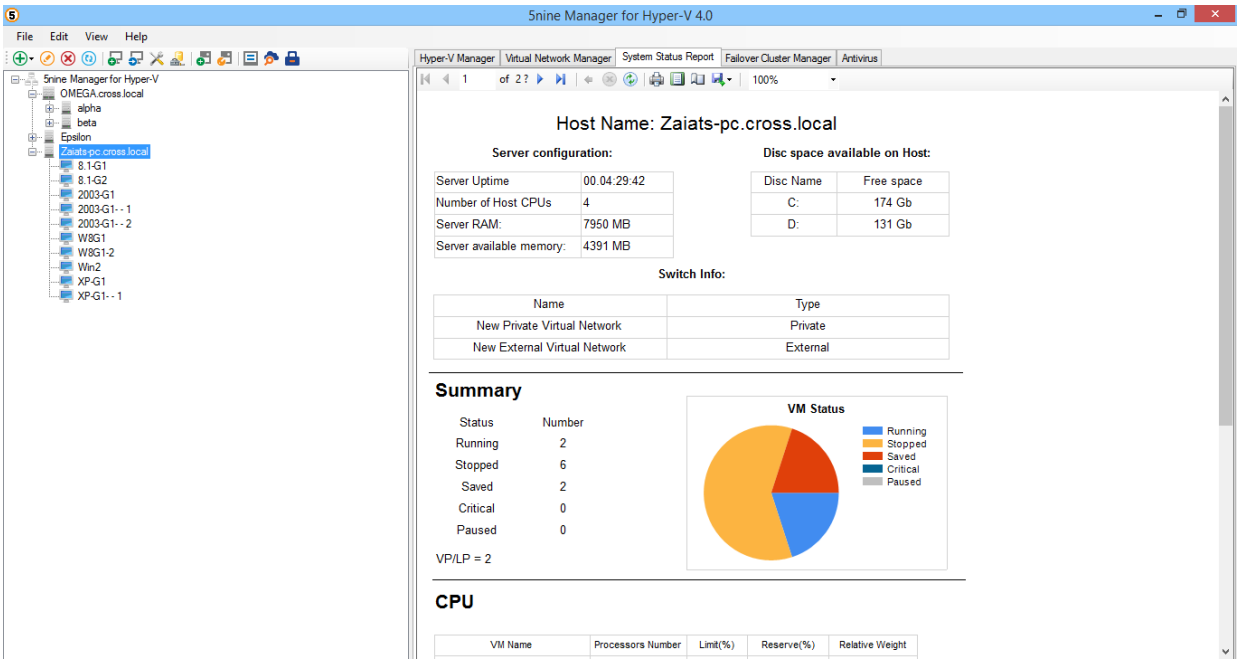
Integration services

To install integration services to the VM, insert the integration services disk through 5nine Manager for Hyper-V Guest Console. To insert the integration services disk through 5nine Manager for Hyper-V Guest Console, connect to a VM and use the **Action – Insert Integration Services Setup Disc** menu command (Ctrl+I).

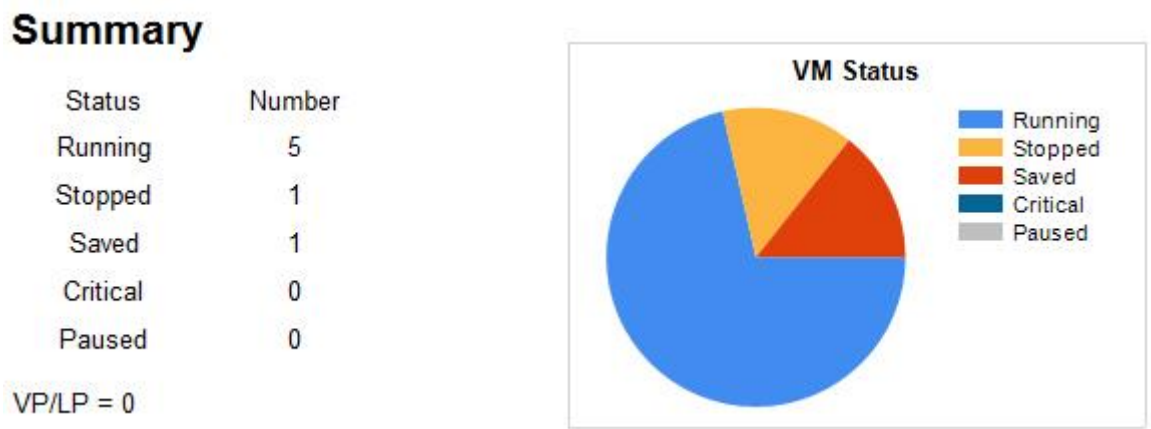
System status report

A System Status Report can be generated only on the host level. This function is available only in the full version of 5nine Manager for Hyper-V that requires purchasing and installing of the license as described in the "Licensing" section).



System Status Report contains the following information:

1. **Summary status information:** shows status distribution among VMs in a table and diagram.



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Shows all possible statuses:

- Running,
- Stopped,
- Saved,
- Critical,
- Paused.

2. Virtual CPU information for each VM:

CPU

VM Name	Processors Number	Limit(%)	Reserve(%)	Relative Weight
Windows2008R2	1	100	100	100
Windows2008R2-2	1	100	100	100
Windows2008R2-3	2	100	100	100
Windows2008R2-4	2	100	100	100
Windows2008R2-5	1	100	100	100
Windows2012-2	1	100	100	100
Windows2012-4	1	100	100	100

- number of logical processors,
- VM reserve (percentage),
- VM limit (percentage),
- relative weight.

3. Virtual memory information for each VM:

Memory

VM Name	Dynamic	Minimum(Mb)	Maximum(Mb)	Buffer(%)	Static(Mb)	Weight
Windows2008R2	True	512	1048576	20		5000
Windows2008R2-2	True	512	1048576	20		5000
Windows2008R2-3	True	512	1024	20		5000
Windows2008R2-4	True	512	1024	20		5000
Windows2008R2-5	True	512	1024	20		5000
Windows2012-2	True	512	2048	20		5000
Windows2012-4	True	512	2048	20		5000

- dynamic memory usage status (on/off),
- minimum (startup) RAM (for dynamic memory),
- maximum RAM (for dynamic memory),
- memory buffer (for dynamic memory),
- static memory size (dynamic memory off),
- memory weight.

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4. Virtual disk information for each VM:

Disk

VM Name	Number	Display Name	Path	Size(Gb)
Windows2008R2	Disk-1	Windows2008R2_7BC70FED-D289-4073-B128-55B3D64273A1.avhdx	C:\ClusterStorage\Volume1\Windows2008R2\Virtual Hard Disks	25
Windows2008R2-2	Disk-1	Windows2008R2.vhdx	C:\ClusterStorage\Volume1\Windows2008R2-2	25
Windows2008R2-3	Disk-1	WINDOWS2008R2.VHDX	C:\ClusterStorage\Volume1\WINDOWS2008R2-3	25
Windows2008R2-4	Disk-1	WINDOWS2008R2_74E3FA53-3C3E-453E-B13B-BCBCFC0F38A6.avhdx	C:\ClusterStorage\Volume1\WINDOWS2008R2-4	25
Windows2008R2-5	Disk-1	Windows2008R2.vhdx	C:\ClusterStorage\Volume1\Windows2008R2-5	25
Windows2012-2	Disk-1	WINDOWS2012_EC3CEABF-E5D9-46C3-923B-2CA8B6E3EA01.avhdx	C:\ClusterStorage\Volume1\Windows2012-2	25
Windows2012-4	Disk-1	Windows2012.vhdx	C:\ClusterStorage\Volume1\Windows2012-4	25
Windows2012-4	Disk-2	Transfer.vhd	C:\ProgramData\5nine\5nine Manager for Hyper-V\Data	128

- VM name on which virtual disk is seated,
- Disk number
- Disk display name,
- Path to VHD(X) file,
- Disk size in GB.

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5. Virtual network settings for each VM:

Network

VM Name	Number	Name	Type	Dynamic	IP	MAC
Windows2008R2	Adapter-1	Private	External	True	10.16.101.204 fe80::64db:e72e:2c47:1ca7	00:15:5D:BC:83:61
Windows2008R2-2	Adapter-1	Private	External	True	10.16.101.205 fe80::ad92:c47c:81ef:f747	00:15:5D:BC:83:5A
Windows2008R2-3	Adapter-1	Private	External	True	10.16.101.206 fe80::1887:83e1:5f:2842	00:15:5D:BC:83:59
Windows2008R2-4	Adapter-1	Private	External	True	10.16.101.207 fe80::5466:f650:4502:8855	00:15:5D:BC:83:60
Windows2008R2-5	Adapter-1	Private	External	True		00:15:5D:BC:83:64
Windows2012-2	Adapter-1	Private	External	True		00:15:5D:BC:83:52
Windows2012-4	Adapter-1	Private	External	True	10.16.101.211 fe80::9496:9d0:8406:c30f	00:15:5D:69:C8:48

- VM name,
- Virtual adapter number,
- Virtual network name,
- Virtual network type: external, internal or private,
- Dynamic MAC address assignment mode (true/false),
- VM IP address IP v4/IP v6,
- Current VM MAC address.

6. Current state info for each VM:

Current State

VM Name	State	Processor Load	Memory Usage	UpTime
Windows2008R2	Running	0 %	572 MB	1.13:06:28
Windows2008R2-2	Running	0 %	517 MB	1.17:17:50
Windows2008R2-3	Running	0 %	786 MB	1.17:17:56
Windows2008R2-4	Running	0 %	1000 MB	1.17:17:11
Windows2008R2-5	Off	0 %	0 MB	0.00:00:00
Windows2012-2	Saved	0 %	0 MB	0.00:00:00
Windows2012-4	Running	0 %	512 MB	1.17:17:47

- VM name,
- VM state,
- Virtual processor load in percent,

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- Virtual memory usage in MB,
- VM uptime.

7. Snapshots info for each VM:

Snapshots

VM Name	Snapshot Name	Creation time	Snapshot path
Windows2008R2	Windows2008R2 - (10/7/2013 - 3:25:04 PM)	10/7/2013 3:25:09 PM	C:\ClusterStorage \Volume1\Windows2008R2\Virtual Hard Disks\Windows2008R2.vhdx
Windows2008R2-4	Windows2008R2-4 - (9/18/2013 - 10:09:38 PM)	9/18/2013 10:09:45 PM	C:\ClusterStorage \Volume1\WINDOWS2008R2-4\WINDOWS2008R2.VHDX
Windows2012-2	Windows2012-2 - (10/7/2013 - 8:13:33 AM)	10/7/2013 8:13:38 AM	C:\ClusterStorage \Volume1\Windows2012-2\WINDOWS2012.VHDX
Windows2012-2	Windows2012-2 - (10/7/2013 - 8:29:04 AM)	10/7/2013 8:29:08 AM	C:\ClusterStorage \Volume1\Windows2012-2\WINDOWS2012_1CF5670A-34FA-4CC3-B60A-9C22C24CF85B.avhdx

- VM name,
- Snapshot name,
- Snapshot creation date and time,
- Path to the snapshot file.

8. Virtual DVD drives info for each VM:

DVD drives info

VM Name	Address	Mounted media
Windows2008R2	IDE Controller 1, Drive: 0	None
Windows2008R2-2	IDE Controller 1, Drive: 0	None
Windows2008R2-5	IDE Controller 1, Drive: 0	None
Windows2012-2	IDE Controller 1, Drive: 0	None
Windows2012-4	IDE Controller 1, Drive: 0	None

- VM name,
- Controller type and number; drive number,
- Mounted media description.

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9. Integration services info for each VM:

Integration services available

VM Name	Backup	Data exchange	Heartbeat	Shutdown	Time sync
Windows2008R2	yes	yes	yes	yes	yes
Windows2008R2-2	yes	yes	yes	yes	yes
Windows2008R2-3	yes	yes	yes	yes	yes
Windows2008R2-4	yes	yes	yes	yes	yes
Windows2008R2-5	yes	yes	yes	yes	yes
Windows2012-2	yes	yes	yes	yes	yes
Windows2012-4	yes	yes	yes	yes	yes

- VM name,
- Backup service availability,
- Data exchange service availability,
- Heartbeat service availability,
- Shutdown availability,
- Time synchronization availability.

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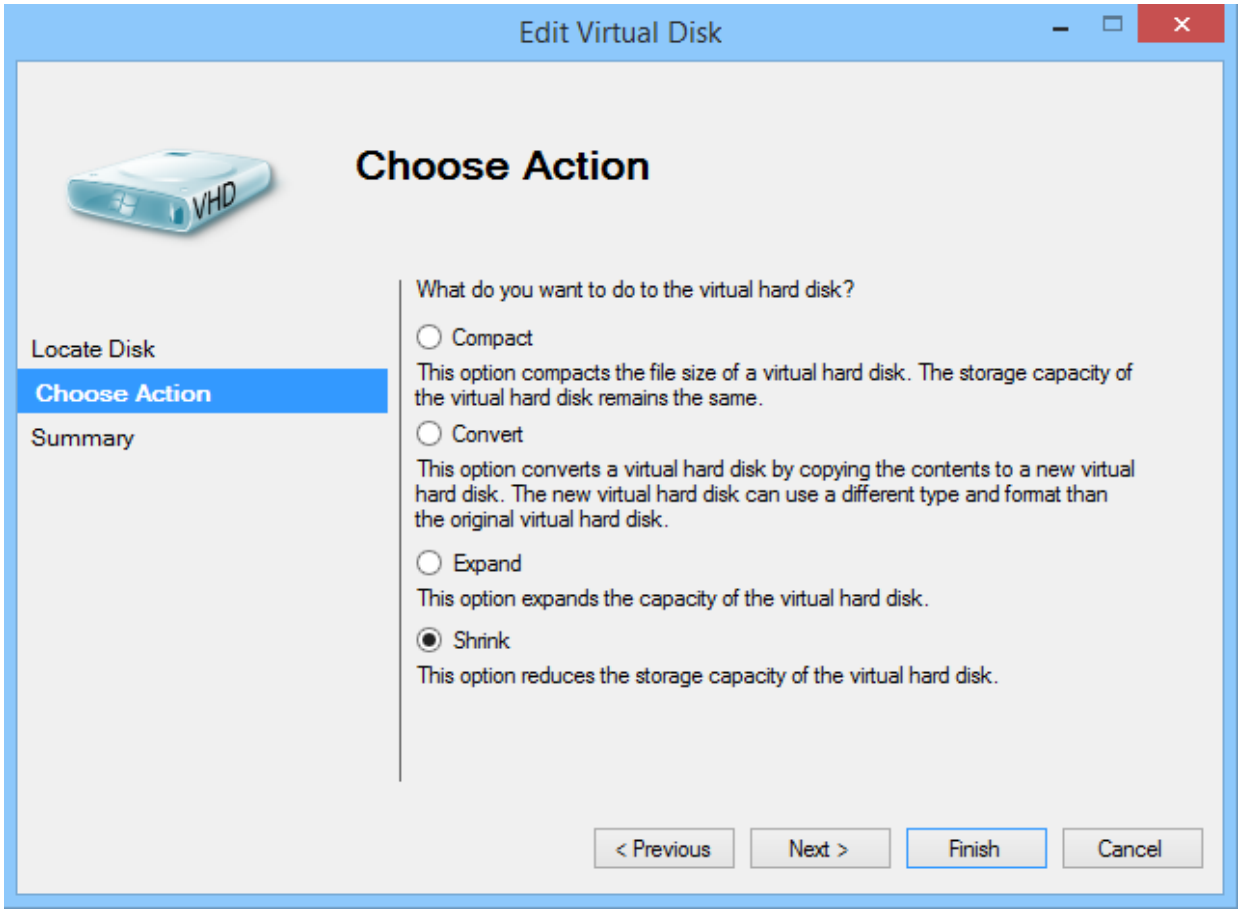
Failover cluster manager

Failover cluster manager is located on the **Failover Cluster Manager** tab. This tab functions as "observation only." The active operations, such as clustered VM migration, are done on the **Hyper-V Manager tab** (please refer to the "Shrink action:



This option will reduce the storage capacity of the virtual hard disk. This only applies to fixed size virtual hard disks.

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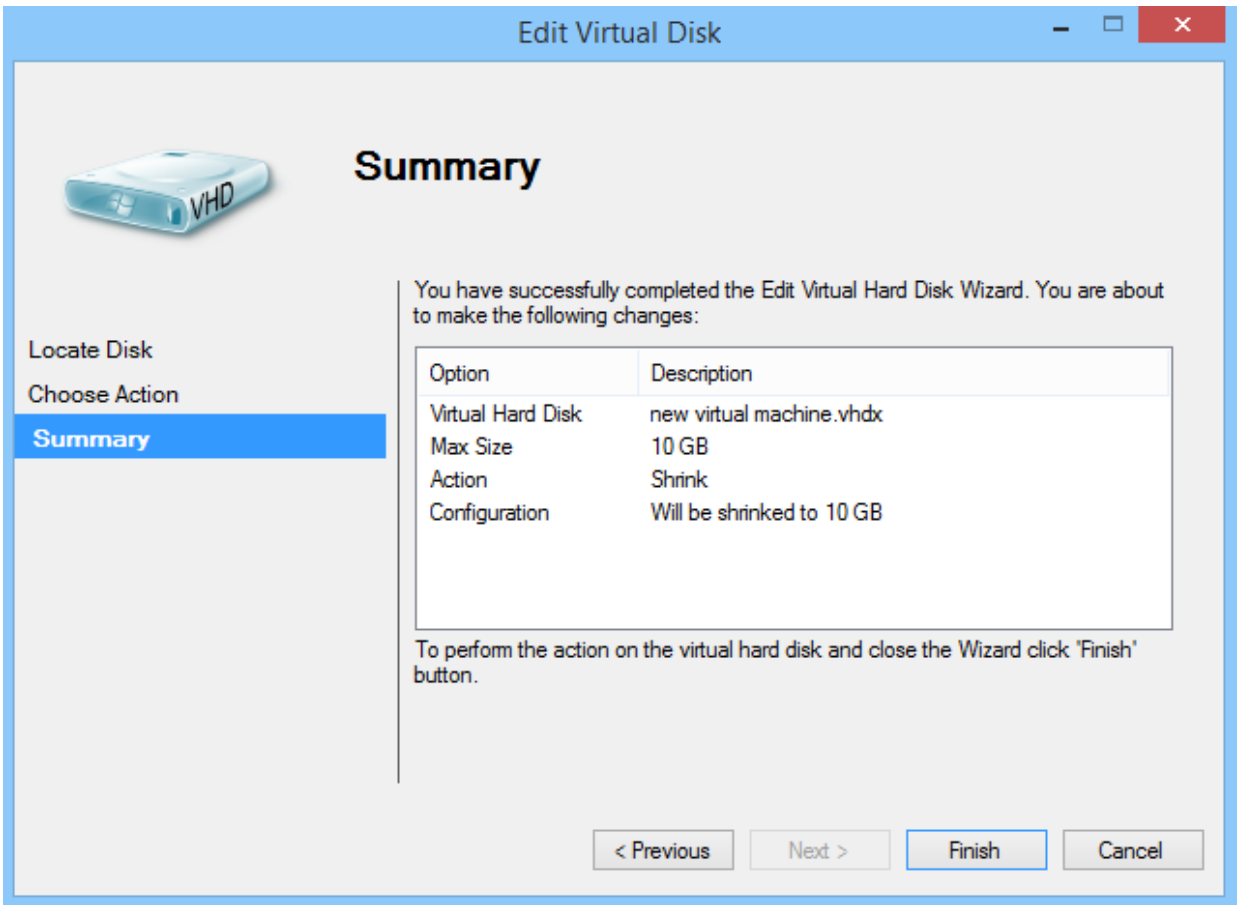
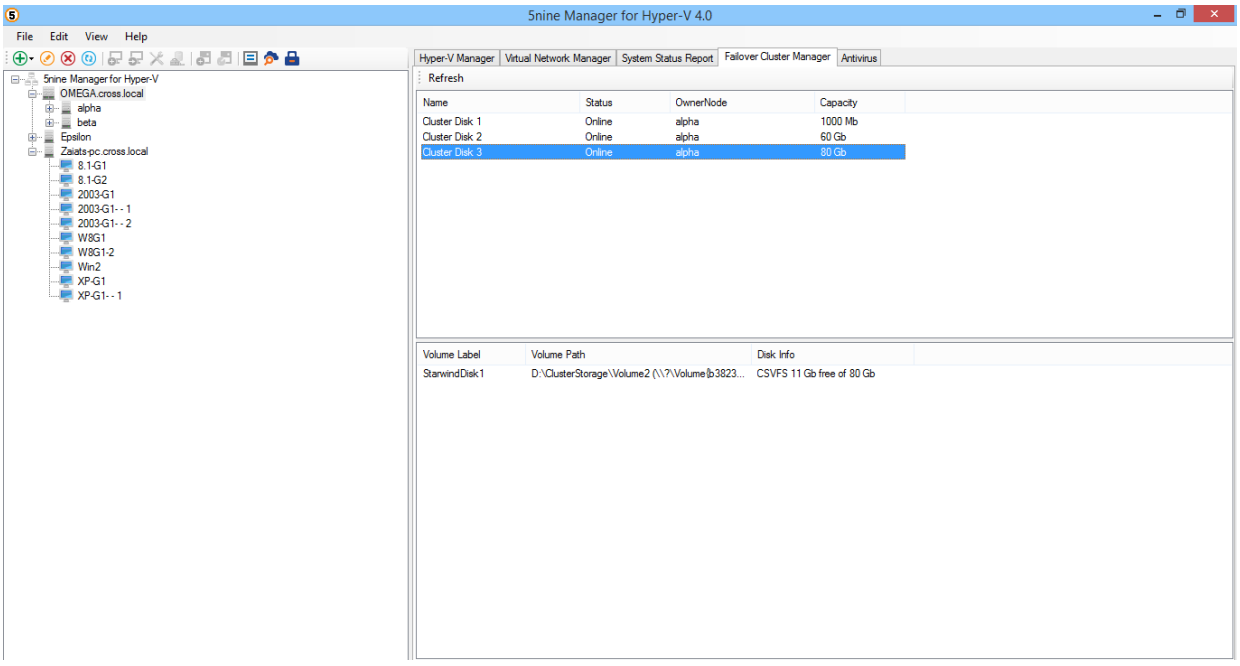


Review the summary for shrink action and click **Finish** to complete the editing process of the virtual hard disk.

Operations with virtual machines

" section). To view the failover cluster manager information, select the cluster in the object tree first, and then go to the **Failover Cluster Manager** tab:



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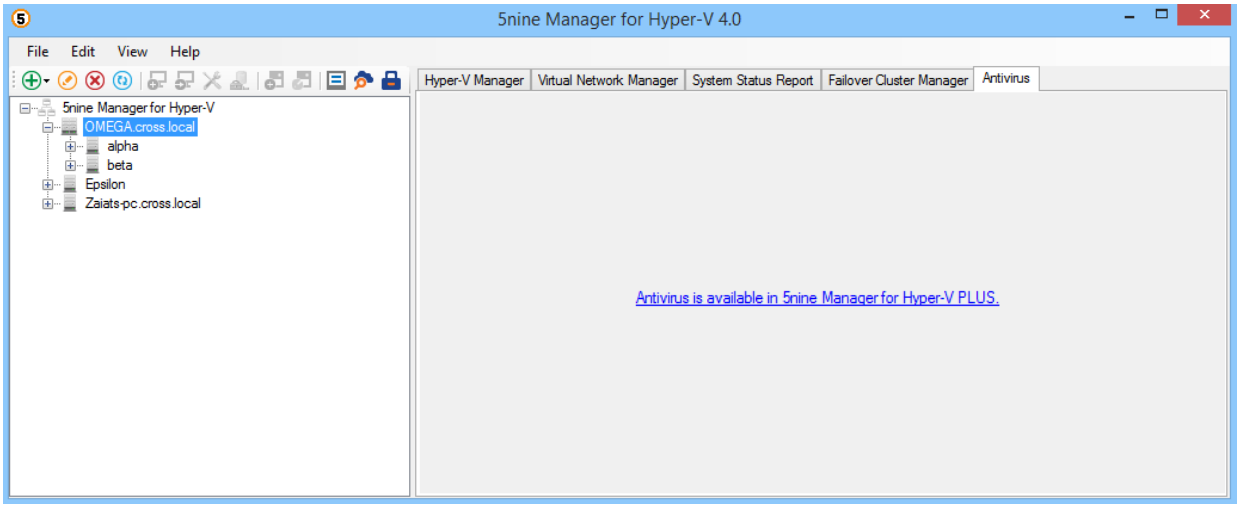
Here you can find the shared cluster volumes information, such as: which volumes are currently in use, their status, owner node, capacity and location. The **Refresh** button is used to update the data shown on the tab.

Antivirus

The Antivirus feature is available in 5nine Manager for Hyper-V PLUS. You will be prompted to use 5nine Manager for Hyper-V PLUS when you open the Antivirus tab:



The link will lead you to 5nine production site, where you will be able to register and download the trial version of 5nine Manager for Hyper-V PLUS.

Licensing

Some features of 5nine Manager for Hyper-V are available only in its full version, which requires purchasing and installation of the license. These features now include:

- VM live migration (applies to clustered VMs);
- System status report;
- Import VM;
- Move Wizard;
- VM Clone/Export;
- Virtual SAN Manager;
- Apply settings to other hosts;
- Real-time monitoring and alerting via 5nine Cloud Monitor for Hyper-V.

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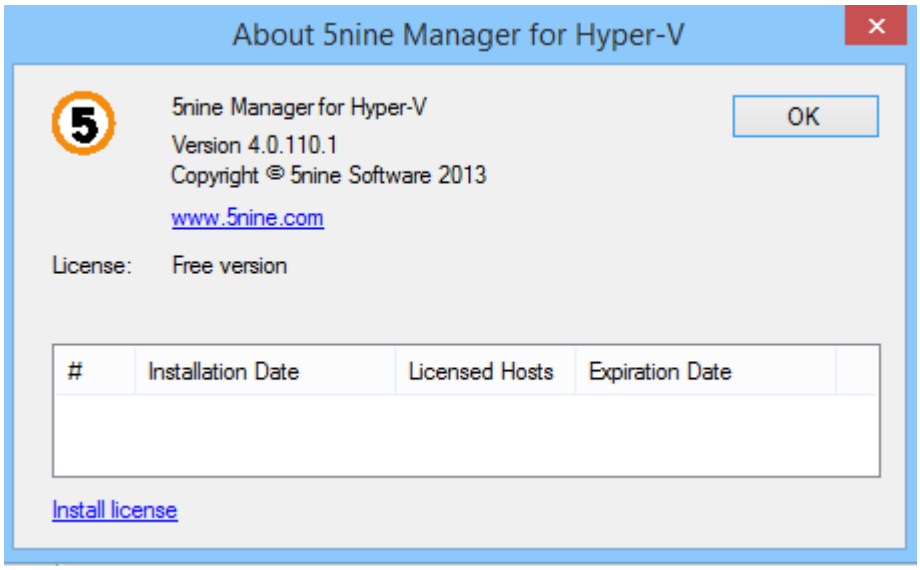
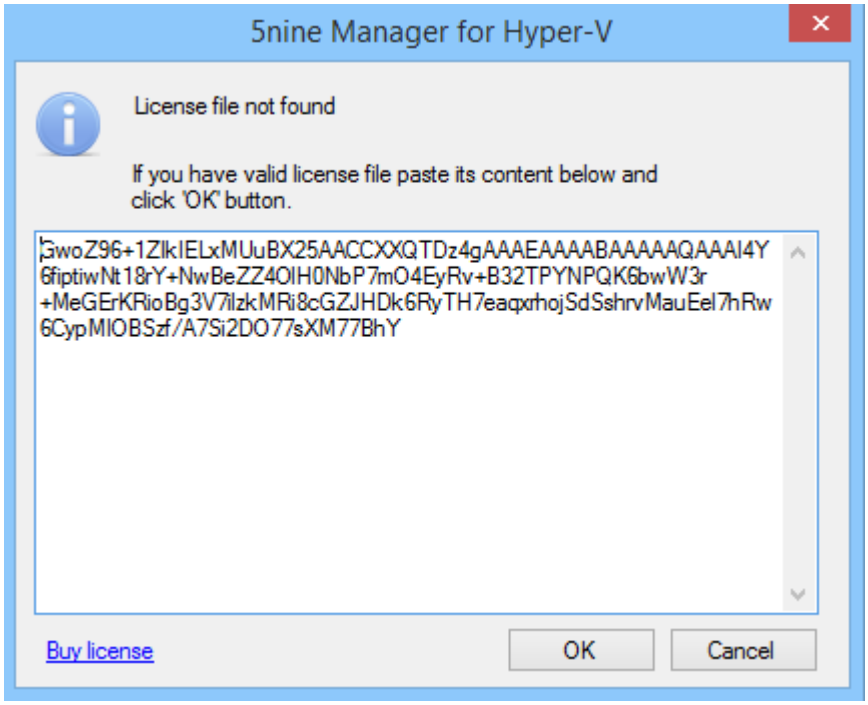
When an attempt to access these features is done on the free version of 5nine Manager for Hyper-V, the system prompts you to acquire and install the license. The link to that is given. You can also acquire and install the license using the **Help – About 5nine Manager for Hyper-V** menu command:



Click the "Install license" link to open the license installation dialog:



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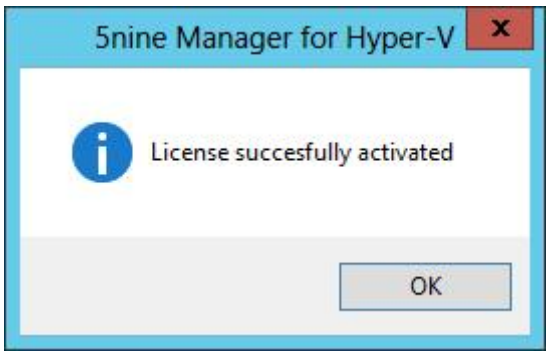
If you already have the license *.txt* file, open it, copy its contents and paste it into the dialog as shown on the picture above. If you do not have one, go to www.5nine.com to register and purchase the license. The Buy license link at the bottom of the dialog will also lead you to 5nine production site. Click **OK**. The following message will appear once the license is successfully activated:



Integration with other 5nine products

5nine Cloud Monitor for Hyper-V and 5nine Encryptor for Hyper-V can be launched from 5nine Manager for Hyper-V:

- - launch 5nine Cloud Monitor for Hyper-V application.
- - launch 5nine Encryptor for Hyper-V application.

Product Support

Please contact techsupport@5nine.com if you have encountered any issues using 5nine Manager for Hyper-V. Please supply product log files with your query to the support team.

5nine Manager for Hyper-V log files

5nine Manager for Hyper-V writes the following log files that are used to troubleshoot the product and contains information of its activity:

Log file name	Location	Description
5nine.Manager.txt	%\ProgramData\5nine\5nine Manager for Hyper-V\Logs	Contains information of 5nine Manager for Hyper-V general functions: objects operations, connection.
5nine.FileManager.txt	%\ProgramData\5nine\5nine Manager for Hyper-V\Logs	Contains information related to 5nine Manager for Hyper-V File Manager operation.
5nine.VmConsole.txt	%\ProgramData\5nine\5nine	Contains information related to

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Manager for Hyper-V\Logs	usage of 5nine Manager for Hyper-V Guest Console.

Uninstallation

To uninstall 5nine Manager for Hyper-V from your server, go to **Control Panel – Programs – Programs and Features – Uninstall a Program**. Then choose "5nine Manager for Hyper-V" on the program list and click **Uninstall** to run the 5nine Manager for Hyper-V uninstallation process, and then follow the system prompts.

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