HP Operations Orchestration Software

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Microsoft Hyper-V Integration Guide

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- The OO Support site
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The HP Operations Orchestration software (HP OO) documentation set is made up of the following:

- Help for Central

  Central Help provides information to the following:

  - Finding and running flows
  - For HP OO administrators, configuring the functioning of HP OO
  - Generating and viewing the information available from the outcomes of flow runs

  The Central Help system is also available as a PDF document in the HP OO home directory, in the \Central\docs subdirectory.

- Help for Studio

  Studio Help instructs flow authors at varying levels of programming ability.

  The Studio Help system is also available as a PDF document in the HP OO home directory, in the \Studio\docs subdirectory.

- Animated tutorials for Central and Studio

  HP OO tutorials can each be completed in less than half an hour and provide basic instruction on the following:

  - In Central, finding, running, and viewing information from flows
  - In Studio, modifying flows

  The tutorials are available in the Central and Studio subdirectories of the HP OO home directory.

- Self-documentation for operations and flows in the Accelerator Packs and ITIL folders

  Self-documentation is available in the descriptions of the operations and steps that are included in the flows.

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Overview of Microsoft Hyper-V integration

Server virtualization is the masking of server resources, including the number and identity of individual physical servers, processors, and operating systems, from server users. Microsoft Hyper-V Server is a dedicated stand-alone product that provides a dependable virtualization solution that allows organizations to improve server utilization and reduce costs.

This integration assists administrators to build HP Operations Orchestration (OO) flows that are integrated with the release versions of Microsoft Hyper-V for Windows 2008 and Microsoft Hyper-V for Windows 2008 R2.

This document will explain how this integration has been implemented and how the operations that are included for communicating between OO and Hyper-V work.

Use cases and scenarios

The following are the major use cases for the Microsoft Hyper-V integration, and the operations that you can use to implement them.

1. Manage job status:
   - Get Job State
   - List Jobs
   - Terminate Job
2. Manage server status:
   - Host Enumerate Virtual Machines
   - List Long Running Virtual Machines
   - List Old Virtual Machines
3. Manage snapshots:
   - Apply Snapshot
   - Create Snapshot
   - Delete Snapshot
   - Delete Snapshot Tree
   - Enumerate Snapshots
   - Export Snapshot
   - Import Snapshot
   - Rename Snapshot
4. Manage virtual hard disk operations:
   - Add SCSI Controller
   - Attach Virtual Hard Disk to SCSI Controller
   - Attach Virtual Hard Disk to Virtual Machine
   - Compact Virtual Hard Disk
   - Convert Virtual Hard Disk
   - Create Differencing Virtual Hard Disk
   - Create Virtual Hard Disk
   - Delete SCSI Controller
   - Detach Virtual Hard Disk from SCSI Controller
   - Expand Virtual Hard Disk

- Get Disks Attached to SCSI Controller
- Get SCSI Controllers
- Get Virtual Hard Disk Information
- Merge Differencing Virtual Hard Disk
- Reconnect Differencing Virtual Hard Disk
- Remove Device From IDE Controller
- Validate Virtual Hard Disk

5. Manage virtual machine actions:
   - Create Blank Virtual Machine
   - Delete Virtual Machine
   - Export Virtual Machine
   - Get Virtual Machine State
   - Import Virtual Machine
   - Pause Virtual Machine
   - Rename Virtual Machine
   - Save Virtual Machine
   - Shutdown Virtual Machine
   - Start Virtual Machine
   - Stop Virtual Machine
6. Manage virtual machine configuration:
   - Change Boot Order
   - Get Number Of Processors For Virtual Machine
   - Get Virtual Machine Memory
   - Get Virtual Machine Operating System Name
   - Get Virtual Machine Processor Usage
   - Resource Control
   - Set Memory Size
   - Set Number Of Processors
   - Set Processor Compatibility
7. Manage virtual networks:
   - Attach Legacy NIC to Virtual Machine
   - Attach NIC to Virtual Machine
   - Attach virtual machine To Network
   - Change MAC for Legacy NIC
   - Change MAC for NIC
   - Create Internal Network
   - Create Private Network
   - Delete Network
   - Detach Virtual Machine From Network
   - Remove Legacy NIC by ID
   - Remove Legacy NIC by MAC
   - Remove NIC by ID
   - Remove NIC by MAC

Installation and configuration instructions

The only requirement is that you install a Windows-based RAS that can connect to the Hyper-V server over WMI.

Versions

Operations Orchestration Version	Microsoft Hyper-V Version
9.00.05	Windows 2008 release version Windows 2008 R2 release version

Architecture

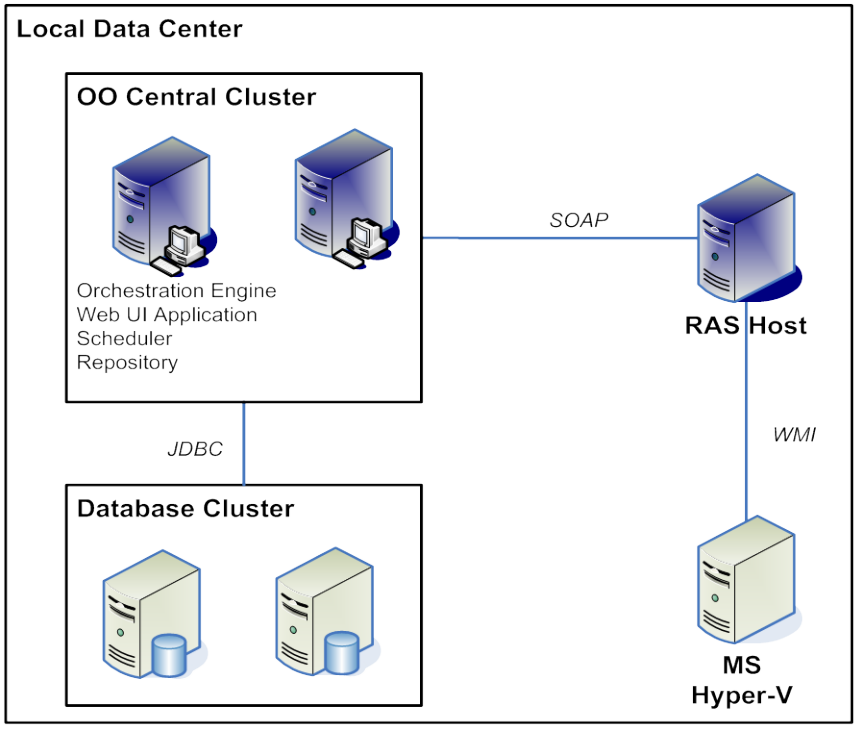

Figure 1 - Microsoft Hyper-V architecture

Hyper-V integration operation infrastructure

The Hyper-V integration includes the following operations in the OO Studio Library/Integrations/Microsoft/Hyper-V/ folder.

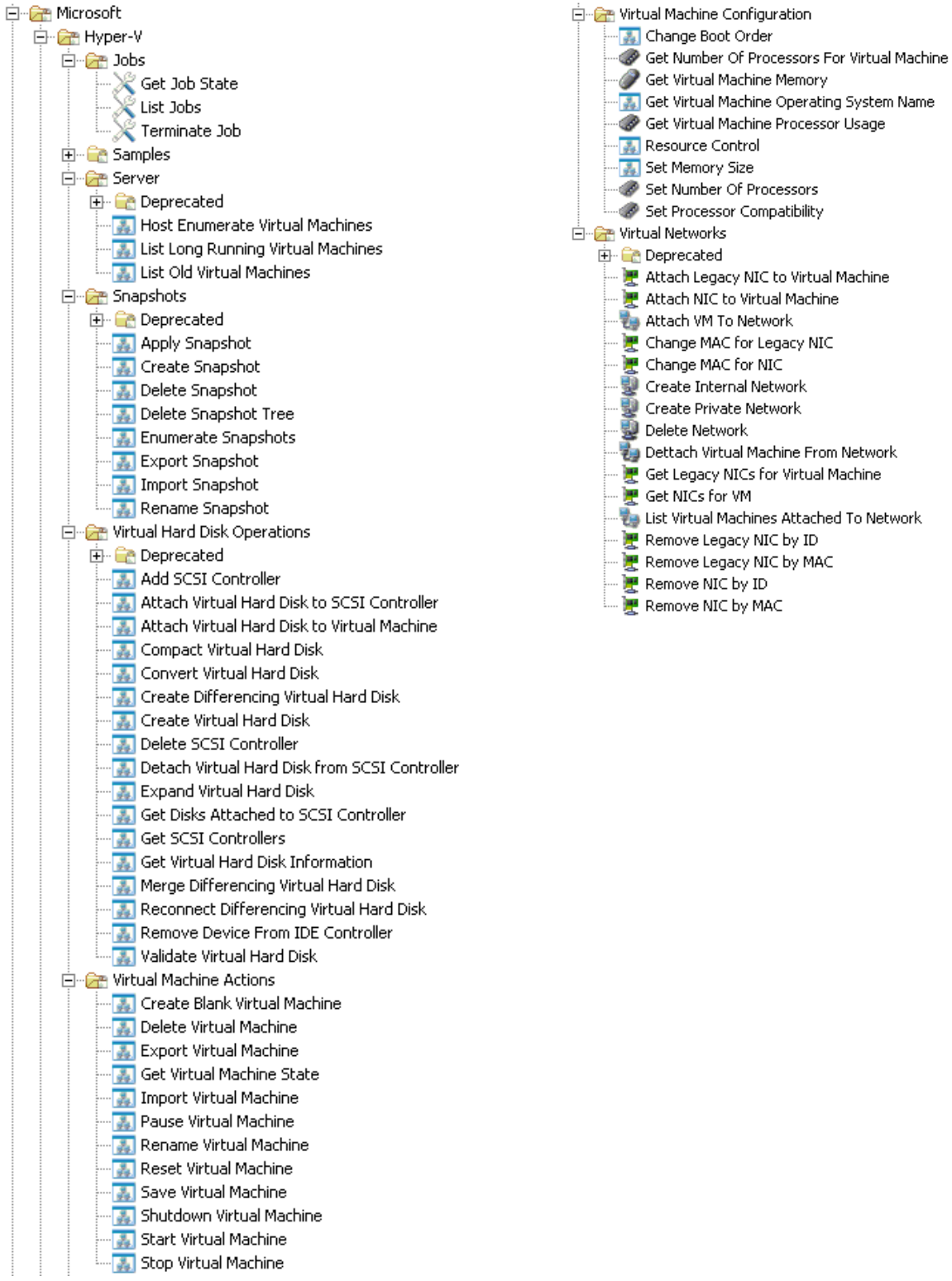

Figure 2 - Microsoft Hyper-V operation infrastructure

Common inputs in the integration

OO flows and operations use inputs to specify how they obtain the data that they need and when the data is obtained. The following inputs are used consistently throughout the Hyper-V integration's operations and flows.

All other inputs needed by the operations are explained on the **Description** tabs of their **Properties** sheets in OO Studio.

host

The Hyper-V Virtualization Server machine.

username

The username for connecting to the Hyper-V Virtualization Server.

password

The password for connecting to the Hyper-V Virtualization Server.

Operation specifics

This section describes the Microsoft Hyper-V integration's operations, including any operation-specific inputs. The operations are grouped by their basic functionality:

- Jobs
- Server
- Snapshots
- Virtual Hard Disk Operations
- Virtual Machine Actions
- Virtual Machine Configuration
- Virtual Networks

Important: For all Hyper-V operations to work correctly, you must:

- Use a user account that has Administrator privileges assigned to it.
- To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC).
- Enable **File and Printer Sharing for Microsoft Networks;** otherwise the operations will fail with the error "The network path was not found".
- If an operation cannot be executed instantly by Hyper-V, a reference to the launched job that is responsible for the operation is returned. You should monitor the job based on its **jobID** to assure that the operation completes successfully.

Jobs

Get Job State

The **Get Job State** operation returns the state of a job on a Hyper-V Virtualization Server.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

jobID

The ID of the job for which the state is retrieved.

The operation returns the following:

returnResult

Information about a job on a Hyper-V Server.

jobState

The job state (such as **running**, **starting**, or **completed**).

percentComplete

A number between 0 and 100 indicating the percent of job completion.

errorDescription

The description of an error if one occurs.

Notes:

- This feature is available for the Hyper-V versions for Windows Server 2008 and Windows Server 2008 R2.
- For some jobs, **percentComplete** never reaches 100, although the job completes normally. For this reason, use **jobState** result to accurately determine whether the job completed successfully.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

List Jobs

The **List Jobs** operation gets the jobs existing on a Hyper-V Virtualization Server which are in one of the specified states.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

jobStates

The states of the jobs to return. The valid job states are **new**, **starting**, **running**, **suspended**, **shutting down**, **completed**, **terminated**, **killed**, and **exception** (for example, **completed, exception**). If you do not specify a value, all jobs are retrieved.

delimiter

The delimiter used to separate the job states in the **jobStates** input. If you do not specify a value for this input, the **delimiter** input value is set to a comma (,) by default.

colDelimiter

The delimiter used to separate the columns in the results table. If you do not specify a value for this input, the **colDelimiter** input value is set to a comma (,) by default.

rowDelimiter

The delimiter used to separate the rows in the results table. If you do not specify a value for this input, the **rowDelimiter** input value is set a line separator (|) by default.

includeHeader

Specifies whether the result table should include the table column names. The valid values are **true** and **false**. The default value is **false**.

The operation returns the following:

returnResult

The returned jobs listed in a table containing the following columns: **Caption**, **Description**, **ElapsedTime**, **InstanceID**, **JobState**, **JobStatus**, **Name**, **Notify**, **Owner**, **Priority**, **StartTime**, **Status**, **TimeBeforeRemoval**, **TimeOfLastStateChange**, **TimeSubmitted**, and **UntilTime**. The column fields are separated by the **colDelimiter** input value. The jobs are delimited by the **rowDelimiter** input value. If there are no jobs, an empty string is returned. If you specify a value of **true** for the **includeHeader** input, the table column names are included; if you specify **false**, the table column names are not included.

Notes:

- This feature is available for the Hyper-V versions for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Terminate Job

The **Terminate Job** operation stops the specified job on a Hyper-V Virtualization Server cleanly:

- Saving data
- Preserving the state
- Shutting down all underlying processes in an orderly manner

All of the operation's inputs except the following are described in *Common inputs in the integration*.

jobID

The ID of the job for which the state is terminated.

Notes:

- This feature is available for the Hyper-V versions for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Server

Host Enumerate Virtual Machines

The **Host Enumerate Virtual Machines** operation returns a list of the virtual machines existing on a Hyper-V Virtualization Server.

All of the operation's inputs are described in *Common inputs in the integration*.

The operation returns the following:

returnResult

The virtual machines available on the server.

Notes:

- This feature is available for the Hyper-V versions for Windows Server 2008 and Windows Server 2008 R2.

- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

List Long Running Virtual Machines

The **List Long Running Virtual Machines** operation returns a list of the virtual machines existing on a Hyper-V Virtualization Server that have been running for a longer period of time than the threshold (given in milliseconds).

All of the operation's inputs except the following are described in *Common inputs in the integration*.

thresholdTime

The threshold (in milliseconds) after which a virtual machine is considered to be running for a long time. If you do not specify this input, all existing virtual machines are returned.

The operation returns the following:

returnResult

A list of the virtual machines running for a longer time than the specified threshold.

Notes:

- This feature is available for the Hyper-V versions for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

List Old Virtual Machines

The **List Old Virtual Machines** operation returns a list of the virtual machines existing on a Hyper-V Virtualization Server that were created before a given threshold date.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

thresholdDate

The threshold date. The format for this input is *dd/mm/yyyy hh:mm:ss*.

The operation returns the following:

returnResult

A list of the virtual machines older than the specified threshold.

Notes:

- This feature is available for the Hyper-V versions for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Snapshots

Apply Snapshot

The **Apply Snapshot** operation applies a snapshot to a virtual machine existing on a Hyper-V Virtualization Server. You can uniquely identify a snapshot by providing either a snapshot name, or a snapshot name and a snapshot identifier. If you have more than one snapshot with the same name and you don't provide a snapshot identifier, the most recent snapshot is applied.
All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The virtual machine to which the snapshot is applied.

snapshotName

The name for the snapshot to be applied.

snapshotID

The identifier of the snapshot to be applied, provided by the **Enumerate** operation. You must specify a value for this input if you have more than one snapshot with the same name.

delimiter

The delimiter that separates the job IDs in the result. If you do not specify a value for this input, the **delimiter** input value is set to a comma (,) by default.

The operation returns the following:

returnResult

A list of optional references to the jobs that have been launched. If Hyper-V executes one of these operations immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the Hyper-V versions for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Create Snapshot

The **Create Snapshot** operation creates a snapshot of a virtual machine existing on a Hyper-V Virtualization Server.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The virtual machine whose snapshot will be created.

snapshotName

The name of the snapshot to be created.

delimiter

The delimiter that separates the job IDs in the result. If you do not specify a value for this input, the **delimiter** input value is set to a comma (,) by default.

The operation returns the following:

returnResult

A list of optional references to the jobs that have been launched. If Hyper-V executes one of these operations immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the Hyper-V versions for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Delete Snapshot

The **Delete Snapshot** operation deletes a snapshot for a virtual machine existing on a Hyper-V Virtualization Server. You can uniquely identify a snapshot by providing either a snapshot name, or a snapshot name and a snapshot identifier. If you have more than one snapshot with the same name and you don't provide a snapshot identifier, the most recent snapshot is deleted.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The virtual machine for which a snapshot is deleted.

snapshotName

The name of the snapshot to be deleted.

snapshotID

The identifier of the snapshot to be applied, provided by the **Enumerate** operation. You must specify a value for this input if you have more than one snapshot with the same name.

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, an empty string is returned. Otherwise, the ID of the job is retrieved and can be used for monitoring.

Notes:

- This feature is available for the Hyper-V versions for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Delete Snapshot Tree

The **Delete Snapshot Tree** operation deletes a snapshots tree for a virtual machine existing on a Hyper-V Virtualization Server. The root of the tree is the given snapshot. You can uniquely identify a snapshot by providing either a snapshot name, or a snapshot name and a snapshot identifier. If you have more than one snapshot with the same name and you don't provide a snapshot identifier, the most recent snapshot is considered the root of the tree to be deleted.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The virtual machine for which the snapshot tree is deleted.

snapshotName

The name of the snapshot that is the root of the tree to be deleted.

snapshotID

The identifier of the snapshot which is the root of the tree to be deleted, provided by the **Enumerate** operation. You must specify a value for this input if you have more than one snapshot with the same name.

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, an empty string is returned. Otherwise, the ID of the job is retrieved and can be used for monitoring.

Notes:

- This feature is available for the Hyper-V versions for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Enumerate Snapshots

The **Enumerate Snapshots** operation lists the snapshots available for a virtual machine existing on a Hyper-V Virtualization Server.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The virtual machine for which the snapshots are listed.

delimiter

The characters used to separate the snapshot names and identifiers in the **returnResult** results and **snapshotIds** results. The default value is a new line.

The operation returns the following:

returnResult

The list of snapshots for the virtual machine, separated by the delimiter.

snapshotIds

The list of snapshot identifiers for the snapshots listed in **returnResult**. If a virtual machine has more than one snapshot with the same name, you can differentiate them using snapshot identifiers.

snapshotTree

A depiction of the snapshot tree, one snapshot per line. Each child snapshot starts with a tab (\t) indentation to indicate its level in the snapshots hierarchy.

Notes:

- This feature is available for the Hyper-V versions for Windows Server 2008 and Windows Server 2008 R2.

- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Export Snapshot

The **Export Snapshot** operation exports a snapshot of a virtual machine from a Hyper-V Virtualization Server to the directory at the specified path. If the directory does not exist, the operation creates it.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine.

snapshotName

The name of the virtual machine's snapshot to be exported. If the virtual machine has more than one snapshot with this same name, then the most recently created snapshot with this name is the one exported.

snapshotID

The identifier of the snapshot to be exported, provided by the **Enumerate** operation. You must specify a value for this input in if you have more than one snapshot with the same name.

path

The path to the place where the snapshot will be exported. This should be a local path on the Hyper-V Server (for example, **C:\Hyper-V\Snapshots**).

The operation returns the following:

returnResult

The ID of the job that has been launched.

Notes:

- This feature is only available for the release version of Hyper-V for Windows Server 2008.
- If a snapshot other than the first one created for the server (the oldest) will be exported, then you may have to merge the earlier snapshots.
- This operation creates both IPC and WMI connections. The IPC connection is used to validate the path. The username and password are used for both thread and WMI impersonation.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC), but this reduces the system's security.
- This operation requires enabling file and printer sharing on the Hyper-V Virtualization server machine.

Import Snapshot

The **Import Snapshot** operation imports a snapshot of a virtual machine from a Hyper-V Virtualization Server from the directory at the specified path. This operation creates a new virtual machine based on a previously exported snapshot. For this operation to succeed, make sure that the job responsible for performing the export has finished successfully.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

path

The path to the place from where the snapshot of the machine will be imported. This should be a local path on the Hyper-V Server (for example, **C:\Hyper-V\Snapshots\XP Snapshot**).

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes the operation immediately, an empty string is returned. Otherwise, the ID of the job is retrieved and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- This operation creates both IPC and WMI connections. The IPC connection is used to validate the path. The username and password are used for both thread and WMI impersonation.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Rename Snapshot

The **Rename Snapshot** operation renames a snapshot of a virtual machine existing on a Hyper-V Virtualization Server. You can uniquely identify a snapshot by providing either a snapshot name, or a snapshot name and a snapshot identifier. If you have more than one snapshot with the same name and you don't provide a snapshot identifier, the most recent snapshot is renamed.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The virtual machine whose snapshot will be renamed.

snapshotName

The name of the snapshot to be renamed.

snapshotID

The identifier of the snapshot to be renamed, provided by the **Enumerate** operation. You must specify a value for this input if you have more than one snapshot with the same name.

newSnapshotName

The name for the new snapshot.

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes the operation immediately, an empty string is returned. Otherwise, the ID of the job is retrieved and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Virtual Hard Disk Operations

Add SCSI Controller

The **Add SCSI Controller** operation adds a SCSI controller to a virtual machine. You can attach a virtual hard disk to a SCSI controller to increase the amount of storage available to a virtual machine. Do not attach a system disk to a SCSI controller. A virtual hard disk that contains an operating system must be attached to an IDE controller.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine to which the new SCSI controller will be attached.

The operation returns the following:

returnResult

The ID of the job responsible for the creation of the SCSI controller.

SCSIControllerID

The ID of the new SCSI controller. If the operation executes immediately, the **SCSIControllerID** returns the ID of the newly created SCSI controller, and the **returnResul**t is empty. If the Hyper-V server is busy and can't execute the operation, it launches a job and returns an empty string in the **SCSIControllerID** result and the ID of the job in **returnResult**.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- A virtual machine can have up to four SCSI controllers and the virtual machine must be stopped to add a SCSI controller.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Attach Virtual Hard Disk to SCSI Controller

The **Attach Virtual Hard Disk to SCSI Controller** operation attaches a virtual hard disk to the SCSI controller of the specified virtual machine.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine to which the new hard disk will be attached.

SCSIControllerID

The ID of the SCSI controller to which the new VHD will be attached.

path

The local path on the Hyper-V Server where the .vhd file can be found (for example, **C:\Users\Public\Documents\Microsoft Hyper-V\Virtual hard disks\My disk.vhd**).

location

The position where the VHD will be attached. This should be a number between 0 and 63.

delimiter

The delimiter that separates the job IDs in the result. The default value is a comma (,).

The operation returns the following:

returnResult

A list of optional references to the jobs that have been launched. If Hyper-V executes one of these operations immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- Hyper-V Server 2008 R2 allows you to attach a disk to the SCSI controller while the VM is running. If you try this in previous versions of Hyper-V, the operation will fail.
- When the operation cannot execute immediately, two jobs are created: one that adds a new hard drive to the SCSI controller and a second that attaches the given VHD to the new hard drive. In rare cases the first job can execute successfully and the second can fail, leaving the SCSI controller with a hard drive without an associated disk image.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Attach Virtual Hard Disk to Virtual Machine

The **Attach Virtual Hard Disk to Virtual Machine** operation attaches a virtual hard disk to the specified machine.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The virtual machine to which the new virtual hard disk will be attached.

controller

The controller to which the new virtual hard disk will be attached.

position

The position where the virtual hard disk will be attached.

path

The path where the .vhd file can be found. This should be a local path on the Hyper-V Server.

The operation returns the following:

returnResult

A list of optional references to the jobs that have been launched. If Hyper-V executes one of these operations immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- This operation creates both IPC and WMI connections. The IPC connection is used to validate the path of the .vhd file. The **username** and **password** are used for both thread and WMI impersonation.
- If there is already another device (which is not a VHD) at the selected position, the operation fails.

- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Compact Virtual Hard Disk

The **Compact Virtual Hard Disk** operation compacts a dynamic virtual disk image from a Hyper-V Virtualization Server.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

path

The path where the .vhd file can be found. This should be a local path on the Hyper-V Server.

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- This operation creates both IPC and WMI connections. The IPC connection is used to validate the path of the .vhd file. The username and password are used for both thread and WMI impersonation.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Convert Virtual Hard Disk

The **Convert Virtual Hard Disk** operation converts the type (from Fixed to Dynamic or from Dynamic to Fixed) of an existing virtual disk image from a Hyper-V Virtualization Server.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

path

The path where the .vhd file can be found. This should be a local path on the Hyper-V Server.

newPath

The path where the new .vhd file will be found. This should be a local path on the Hyper-V Server.

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.

- This operation creates both IPC and WMI connections. The IPC connection is used to validate the path of the .vhd file. The **username** and **password** are used for both thread and WMI impersonation.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Create Differencing Virtual Hard Disk

The **Create Differencing Virtual Hard Disk** operation creates a differencing virtual hard disk on a Hyper-V Virtualization Server.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

path

The path where the .vhd file will be created. This should end with the name of the virtual hard disk to be created. It should be a local path on the Hyper-V Server.

parent

The path that specifies the location of the parent virtual hard disk file. This should be a local path on the Hyper-V Server (for example, **C:\Hyper-V\Virtual hard disks\ParentVHD.vhd**).

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- This operation creates both IPC and WMI connections. The IPC connection is used to validate the path of the .vhd file. The **username** and **password** are used for both thread and WMI impersonation.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Create Virtual Hard Disk

The **Create Virtual Hard Disk** operation creates a virtual hard disk on a Hyper-V Virtualization Server.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

path

The path where the .vhd file will be created. This should be a local path on the Hyper-V Server (for example, **C:\Hyper-V\Virtual hard disks**).

diskName

The name of the virtual hard disk. The name should end with .vhd (for example, **DiskName.vhd**).

type

The type of hard disk to be created (Fixed or Dynamic).

size

The size of the hard disk (in GB). This should take be an integer value between 1 and 2048.

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- This operation creates both IPC and WMI connections. The IPC connection is used to validate the path of the .vhd file. The **username** and **password** are used for both thread and WMI impersonation.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Delete SCSI Controller

The **Delete SCSI Controller** operation removes a SCSI controller from a virtual machine. The virtual hard disk file(s) (.vhd) attached to the controller are not deleted.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine from which the SCSI controller will be removed.

SCSIControllerID

The ID of the SCSI controller to be deleted.

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- The virtual machine must be stopped in order to remove a SCSI controller.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Detach Virtual Hard Disk from SCSI Controller

The **Detach Virtual Hard Disk from SCSI Controller** operation removes a virtual hard disk attached to a SCSI Controller of the specified machine. The virtual hard disk file (.vhd) detached from the controller is not deleted.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine from which the hard disk will be detached.

SCSIControllerID

The ID of the SCSI controller whose location will be freed and associated disk detached.

location

The position where the VHD is attached. This should be a number between 0 and 63.

The operation returns the following:

returnResult

An optional reference to the job that has been launched which can be used to monitor the job's progress. If Hyper-V executes this operation immediately, a corresponding empty string is returned.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- Starting with Hyper-V Server 2008 R2, you can detach a disk from the SCSI controller while the VM is running. If you try this on a previous version of Hyper-V, the operation fails.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Expand Virtual Hard Disk

The **Expand Virtual Hard Disk** operation expands an existing virtual hard disk (.vhd) file to the specified size (in GB).

All of the operation's inputs except the following are described in *Common inputs in the integration*.

path

The path where the .vhd file can be found. This should be a local path on the Hyper-V Server (for example, **C:\Hyper-V\Virtual Hard Disks\VHDName.vhd**).

newSize

The new size for the .vhd file in gigabytes.

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- This operation creates both IPC and WMI connections. The IPC connection is used to validate the path of the .vhd file. The username and password are used for both thread and WMI impersonation.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Get Disks Attached to SCSI Controller

The **Get Disks Attached to SCSI Controller** operation returns the list of virtual hard disks attached to the given SCSI controller.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine whose SCSI controller will be queried.

SCSIControllerID

The ID of the SCSI controller whose hard disks are to be retrieved.

rowDelimiter

The character(s) used to separate the names of the virtual hard disks in the return list. The default value is new line.

colDelimiter

The character(s) used to separate the details of each virtual hard disk in the return list. The default value is a comma (,).

The operation returns the following:

returnResult

A list with details about the virtual hard disks attached to the specified SCSI controller. The details are the disk image path (the location of the .vhd file) and the position where the hard disk is attached. If the SCSI controller does not have any hard disks attached, the result is an empty string.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Get SCSI Controllers

The **Get SCSI Controllers** operation returns the list of SCSI controllers attached to a virtual machine.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine whose SCSI controllers are to be retrieved.

delimiter

The character(s) used to separate the SCSI controllers in the return list. The default value is a comma (,).

The operation returns the following:

returnResult

A list with the IDs of the SCSI controllers attached to the specified virtual machine separated by the delimiter. If the machine does not have any SCSI controllers, the result is an empty string.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.

- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Get Virtual Hard Disk Information

The **Get Virtual Hard Disk Information** operation returns information about a virtual hard disk image from a Hyper-V Virtualization Server.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

path

The path where the .vhd file can be found. This should be a local path on the Hyper-V Server.

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, an empty string is returned. Otherwise, the ID of the job is retrieved and can be used for monitoring.

fileSize

The size of the virtual hard disk file on the physical disk (the actual amount of storage being consumed by the VHD), in bytes.

maxInternalSize

The maximum size of the virtual hard disk in bytes as viewable by the virtual machine .

diskType

The type of virtual hard disk.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- This operation creates both IPC and WMI connections. The IPC connection is used to validate the path of the .vhd file. The username and password are used for both thread and WMI impersonation.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Merge Differencing Virtual Hard Disk

The **Merge Differencing Virtual Hard Disk** operation merges a differencing virtual hard disk with its parent.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

path

The path that specifies the location of the merging virtual hard disk (.vhd) file. This should be a local path on the Hyper-V Server (for example, **C:\Hyper-V\Virtual hard disks\DifferencingVHD.vhd**).

parent

The path that specifies the location of the parent virtual hard disk (.vhd) file into which data will be merged. This could be the immediate parent or a parent from a few levels up the

differencing drive chain. This should be a local path on the Hyper-V Server (for example, **C:\Hyper-V\Virtual hard disks\ParentVHD.vhd**).

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, an empty string is returned. Otherwise, the ID of the job is retrieved and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- This operation creates both IPC and WMI connections. The IPC connection is used to validate the path of the .vhd file. The username and password are used for both thread and WMI impersonation.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Reconnect Differencing Virtual Hard Disk

The **Reconnect Differencing Virtual Hard Disk** operation fixes broken links between a differencing virtual hard disk (.vhd) file and its parent.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

path

The path that specifies the location of the parent virtual hard disk (.vhd) file. This should be a local path on the Hyper-V Server (for example, **C:\Hyper-V\Virtual hard disks\DifferencingVHD.vhd**).

parent

The path that specifies the location of the parent virtual hard disk (.vhd) file into which data will be merged. This could be the immediate parent or a parent from a few levels up the differencing drive chain. This should be a local path on the Hyper-V Server (for example, **C:\Hyper-V\Virtual hard disks\ParentVHD.vhd**).

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, an empty string is returned. Otherwise, the ID of the job is retrieved and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- This operation creates both IPC and WMI connections. The IPC connection is used to validate the path of the .vhd file. The username and password are used for both thread and WMI impersonation.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Remove Device From IDE Controller

The **Remove Device From IDE Controller** operation removes a device attached to an IDE Controller of the specified machine.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The virtual machine from which the device will be removed.

controller

The controller from which the device will be removed.

position

The position from which the device will be removed.

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, an empty string is returned. Otherwise, the ID of the job is retrieved and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Validate Virtual Hard Disk

The **Validate Virtual Hard Disk** operation validates whether a virtual disk image from a Hyper-V Virtualization Server can be opened in read-only mode.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

path

The path where the .vhd file can be found. This should be a local path on the Hyper-V Server (for example, **C:\Virtual Hard Disks\My Disk.vhd**).

The operation returns the following:

returnResult

A list of optional references to the jobs that have been launched. If Hyper-V executes one of these operations immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- This operation creates both IPC and WMI connections. The IPC connection is used to validate the path of the .vhd file. The username and password are used for both thread and WMI impersonation.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Virtual Machine Actions

Create Blank Virtual Machine

The **Create Blank Virtual Machine** operation creates a blank virtual machine on a Hyper-V Virtualization Server. The virtual machine that is created has the specified name, a default of 512 MB of RAM, and one CPU. All the others resources should be added later.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine to be created.

The operation returns the following:

returnResult

An optional references to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Delete Virtual Machine

The **Delete Virtual Machine** operation deletes a virtual machine existing on a Hyper-V Virtualization Server without deleting its corresponding virtual hard-disk (.vhd file).

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine to be deleted.

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- The virtual hard disk is not deleted.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Export Virtual Machine

The **Export Virtual Machine** operation exports a virtual machine from a Hyper-V Virtualization Server to the directory at the specified path. If the directory does not exist, the operation creates it.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine to be exported.

path

The path to the place where the machine will be exported. This should be a local path on the Hyper-V Server (for example, **C:\Hyper-V\Virtual Machines**).

The operation returns the following:

returnResult

An optional references to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- This operation creates both IPC and WMI connections. The IPC connection is used to validate the path. The username and password are used for both thread and WMI impersonation.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Get Virtual Machine State

The **Get Virtual Machine State** operation retrieves the current state of a virtual machine existing on a Hyper-V Virtualization Server.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine for which the current state is retrieved.

The operation returns the following:

returnResult

The state of the virtual machine (such as **starting**, **running**, **stopped**, or **paused**).

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Import Virtual Machine

The **Import Virtual Machine** operation imports a virtual machine from a Hyper-V Virtualization Server from the directory at the specified path. This operation creates a new virtual machine based

on a previously exported one. In order for this operation to succeed, make sure that the job responsible for performing the export has finished successfully.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

path

The path to the place from where the machine will be imported. This should be a local path on the Hyper-V Server (for example, **C:\Hyper-V\Virtual Machines\XP Machine**).

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- This operation creates both IPC and WMI connections. The IPC connection is used to validate the path. The username and password are used for both thread and WMI impersonation.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Pause Virtual Machine

The **Pause Virtual Machine** operation pauses a virtual machine existing on a Hyper-V Virtualization Server. To resume, use the **Start Virtual Machine** operation.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine to be paused.

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Rename Virtual Machine

The **Rename Virtual Machine** operation renames a virtual machine existing on a Hyper-V Virtualization Server.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine to be renamed.

newVMName

The new name for the virtual machine. This should not be the same as the old one.

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Reset Virtual Machine

The **Reset Virtual Machine** operation resets a virtual machine existing on a Hyper-V Virtualization Server.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine to be reset.

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Save Virtual Machine

The **Save Virtual Machine** operation saves the state of (suspends) a virtual machine existing on a Hyper-V Virtualization Server. To restore the machine, use the **Start Virtual Machine** operation.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine to be saved.

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Shutdown Virtual Machine

The **Shutdown Virtual Machine** operation stops a virtual machine existing on a Hyper-V Virtualization Server

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine to be stopped.

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- The machine is stopped gracefully using "Shutdown". This requires Integrated Services to be installed on the guest VM.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Start Virtual Machine

The **Start Virtual Machine** operation starts a virtual machine existing on a Hyper-V Virtualization Server.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine to be started.

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Stop Virtual Machine

The **Stop Virtual Machine** operation stops a virtual machine existing on a Hyper-V Virtualization Server.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine to be stopped.

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- The machine is stopped using "Turn-off". This doesn't require that Integrated Services be installed on the guest virtual machine.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Virtual Machine Configuration

Change Boot Order

The **Change Boot Order** operation changes the boot order for a virtual machine existing on a Hyper-V Virtualization Server.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine for which the boot order is set.

bootFirstFrom

The device from which to try to boot first.

bootSecondFrom

The device from which to try to boot second.

bootThirdFrom

The device from which to try to boot third.

bootFourthFrom

The device from which to try to boot last.

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- The values for the **bootFirstFrom**, **bootSecondFrom**, **bootThirdFrom**, and **bootFourthFrom** should be different from each other. The valid values are:
  - **Floppy** - The virtual computer system will attempt to boot from the floppy disk in the floppy drive.
  - **CD** - The virtual computer system will attempt to boot from the first CD or DVD disk found with a boot sector.
  - **IDE** - The virtual computer system will attempt to boot from the first hard drive found attached to an IDE controller with a boot sector.
  - **Legacy Network adapter** - The virtual computer system will attempt to boot from the network.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Get Number Of Processors For Virtual Machine

The **Get Number Of Processes For Virtual Machine** operation retrieves the number of processors for a virtual machine existing on a Hyper-V Virtualization Server.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine for which the number of processors is retrieved.

The operation returns the following:

returnResult

The number of processors for the virtual machine.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, in addition to using a user account that has administrator privileges assigned to it, disabling User Account Control (UAC) may be required.

Get Virtual Machine Memory

The **Get Virtual Machine Memory** operation retrieves the memory (in MB) allocated to a virtual machine existing on a Hyper-V Virtualization Server.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine for which the memory size is retrieved.

The operation returns the following:

returnResult

The memory allocated to the virtual machine.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.

- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Get Virtual Machine Operating System Name

The **Get Virtual Machine Operating System Name** operation retrieves the operating system version of a virtual machine existing on a Hyper-V Virtualization Server.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine for which the operating system is retrieved.

The operation returns the following:

returnResult

The operating system version of the virtual machine.

Notes:

- If the operation fails, the operating system of the virtual machine could not be retrieved. Check that the virtual machine exists and is started. Another possible reason for failure is that the operating system version is not supported by Hyper-V supported or IS (Integration Services) is not installed on the machine. The list of supported operating system versions can be found at http://technet.microsoft.com/en-us/library/cc794868(WS.10).aspx.
- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Get Virtual Machine Processor Usage

The **Get Virtual Machine Processor Usage** operation retrieves the CPU usage (in %) for a virtual machine existing on a Hyper-V Virtualization Server.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine for which the CPU usage is retrieved.

The operation returns the following:

returnResult

The CPU usage for the virtual machine.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Resource Control

The **Resource Control** operation controls the resources allocated to a virtual machine existing on a Hyper-V Virtualization Server.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine for which the resources are controlled.

virtualMachineReserve

Of the total resources available to a virtual machine, specify the percentage that is reserved for the virtual machine. This setting guarantees that the percentage you specify will be available to the virtual machine. This setting can also affect how many virtual machines you can run at one time. Since this is a percentage, the value should be an integer between 0 and 100.

virtualMachineLimit

Of the total resources available to a virtual machine, specify the maximum percentage that can be used by the virtual machine. This setting applies regardless of whether other virtual machines are running. Since this is a percentage, the value should be an integer between 0 and 100.

virtualMachineRelativeWeight

Specify how Hyper-V should allocate resources to this virtual machine when more than one virtual machine is running and the virtual machines compete for resources. The value should be an integer between 0 and 1000.

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Set Memory Size

The **Set Memory Size** operation sets the memory size for a virtual machine existing on a Hyper-V Virtualization Server.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine for which the memory size is set.

memorySize

The new size for the memory in megabytes.

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Set Number Of Processors

The **Set Number Of Processors** operation sets the number of processors for a virtual machine existing on a Hyper-V Virtualization Server.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine for which the number of processors is set.

numberOfProcessors

The number of processors. The value should be 1, 2, 3, or 4. The number should not be greater than the number of available processors on the Hyper-V Virtualization Server.

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Set Processor Compatibility

The **Set Processor Compatibility** operation allows you to limit the processor features that a virtual machine can use. This improves the virtual machine`s compatibility with different processor versions and older guest operating systems, but may affect performance.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine for which the processor features are set.

hyperVersion

The version of the Hyper-V Virtualization Server. The valid values are **Windows Server 2008** (the default) and **Windows Server 2008 R2**. If you do not specify a value for this input, the default version is used.

limitProcessorFunctionality

Specifies whether the virtual machine should limit the CPU features exposed to the operating system. Limiting the processor features enables the virtual machine to be migrated to different host computer systems with different processors. The valid values are **true** and **false**. If you do not specify a value for this input, the processor setting is not changed. This input is available only for the Windows Server 2008 R2 version.

runOldOS

Specifies whether to limit processor functionality to run an older operating system such as Windows NT on this virtual machine. The valid values are **true** and **false**. If you do not specify a value for this input, the processor setting is not changed

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2. For Hyper-V on Windows Server 2008, you cannot limit processor features, so you should leave the **limitProcessorFunctionality** input empty.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Virtual Networks

Attach Legacy NIC to Virtual Machine

The **Attach Legacy NIC to Virtual Machine** operation creates and attaches a virtual legacy NIC to the specified machine. A legacy NIC is used when a network installation of the operating system will be done or when the Integration Services are not installed on the guest operating system.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine to which the new legacy NIC is attached.

MAC

The MAC address of the legacy NIC to be attached to the virtual machine. If you do not specify a value for this input, the MAC address is provided dynamically. The MAC address consists of 12 hexadecimal digits, not separated (for example, **001100110011**).

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

legacyNICId

The ID of the newly created legacy NIC.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Attach NIC to Virtual Machine

The **Attach NIC to Virtual Machine** operation attaches a virtual NIC to the specified machine. The MAC of the NIC can be set either statically or dynamically. A NIC's required drivers are installed when the Integrated Services are installed.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine to which the new NIC will be attached.

MAC

The MAC address of the NIC to be attached to the virtual machine. If you do not specify a value for this input, the MAC address is provided dynamically. The MAC address consists of 12 hexadecimal digits, not separated (for example, **001100110011**).

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

NICId

The ID of the newly created NIC.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Attach VM To Network

The **Attach VM To Network** operation attaches a virtual machine to an internal or private virtual network (switch) on the specified port.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine to be attached to the network.

NicID

The ID of the NIC used for attaching the virtual machine to the network.

switchName

The name of the switch at which the virtual machine will be attached.

portName

The port on the switch on which the machine will be connected. If the port does not exist, it is created.

delimiter

The delimiter to separate the job IDs in the result. If you do not assign a value for the delimiter, it is set to a comma "," by default.

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Change MAC for Legacy NIC

The **Change MAC for Legacy NIC** operation changes the MAC address of a virtual legacy NIC from the specified machine.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine from which the MAC of a legacy NIC will be changed.

NicID

The ID of the legacy NIC for which the MAC will be changed.

MAC

The new MAC for the legacy NIC. If you do not specify a value for the input, the existing MAC is removed and the legacy NIC obtains a MAC dynamically. The MAC address consists of 12 hexadecimal digits, not separated (for example, **001100110011**).

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Change MAC for NIC

The **Change MAC for NIC** operation changes the MAC address of a virtual NIC from the specified machine.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine from which the MAC of a NIC will be changed.

NicID

The ID of the NIC for which the MAC will be changed.

MAC

The new MAC for the NIC. If you do not specify a value for the input, the existing MAC is removed and the NIC obtains a new MAC dynamically. The MAC address consists of 12 hexadecimal digits, not separated (for example, **001100110011**).

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Create Internal Network

The **Create Internal Network** operation creates an internal virtual network (switch). Virtual machines connected to this network can communicate between themselves and the host system. There is no connectivity with the physical network.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

switchName

The name of the switch to be created. The maximum number of MAC addresses that can be learned by the switch is 1024.

MAC

The MAC address for the switch. If you do not provide one, it is created dynamically. If you do not specify a value for the input, the existing MAC is removed and the NIC obtains a new MAC dynamically. The MAC address consists of 12 hexadecimal digits, not separated (for example, **001100110011**).

delimiter

The delimiter to separate the job IDs in the result. If you do not assign a value is to the delimiter, it is set to a comma "," by default.

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Create Private Network

The **Create Private Network** operation creates a private virtual network (switch). Virtual machines connected to this network can communicate between themselves. The host system has no connectivity with virtual machines.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

switchName

The name of the switch to be created. The maximum number of MAC addresses that can be learned by the switch is 1024.

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Delete Network

The **Delete Network** operation removes a virtual network from the server.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

switchName

The name of the switch (network) to be removed.

delimiter

The delimiter to separate the job IDs in the result. If you do not assign a value is to the delimiter, it is set to a comma "," by default.

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Detach Virtual Machine From Network

The **Detach Virtual Machine From Network** operation detaches a virtual machine from an internal or private virtual network (switch).

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine to be detached from the network.

NicID

The ID of the NIC used for detaching the virtual machine from the network.

switchName

The name of the switch from which the virtual machine is detached.

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Get Legacy NICs for Virtual Machine

The **Get Legacy NICs for Virtual Machine** operation lists information about virtual legacy NICs for the specified machine.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine from which information about the legacy NIC information is retrieved.

The operation returns the following:

returnResult

The IDs of the legacy NICs.

MAC

The MAC address for the legacy NIC, if it is statically defined. If the address is generated dynamically, this result will be **000000000000**.

Static MAC Address

Specifies whether the MAC is defined statically. The valid values are **true** and **false**.

Connection

The ID of the virtual network to which the legacy NIC is connected.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Get NICs for VM

The **Get NICs for VM** operation lists information about virtual NICs for the specified machine.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The name of the virtual machine from which information about the NICs will be retrieved.

The operation returns the following:

returnResult

The IDs of the NICs.

MAC

The MAC address for the NIC, if it is statically defined. If the address is generated dynamically, result will be **000000000000**.

Static MAC Address

Specifies whether the MAC is defined statically. The valid values are **true** and **false**.

Connection

The ID of the virtual network to which the NIC is connected.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

List Virtual Machines Attached To Network

The **List Virtual Machines Attached To Network** operation lists all of the virtual machines attached to an internal or private virtual network (switch).

All of the operation's inputs except the following are described in *Common inputs in the integration*.

switchName

The name of the switch for which the virtual machines are listed.

delimiter

The delimiter used to separate the virtual machines in the result. The default value is a comma (,). Since virtual machine names are allowed to contain the comma character, you may want to use a character other than a comma as the value for the **delimiter** input.

The operation returns the following:

returnResult

The virtual machines attached to the specified switch.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- This operation is useful when a switch will be deleted. Before a switch is deleted, all the VMs attached to it should be disconnected, otherwise an error occurs at their NICs.

- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Remove Legacy NIC by ID

The **Remove Legacy NIC by ID** operation removes a virtual legacy NIC from the specified machine.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The virtual machine from which the legacy NIC will be removed.

NicID

The ID of the legacy NIC to be removed from the virtual machine.

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Remove Legacy NIC by MAC

The **Remove Legacy NIC by MAC** operation removes a virtual legacy NIC from the specified machine.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The virtual machine from which the legacy NIC will be removed.

MAC

The MAC address of the legacy NIC to be removed from the virtual machine. The MAC address consists of 12 hexadecimal digits, not separated (for example, **001100110011**).

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Remove NIC by ID

The **Remove NIC by ID** operation removes a virtual NIC from the specified machine.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The virtual machine from which the NIC will be removed.

NicID

The ID of the NIC to be removed from the virtual machine.

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Remove NIC by MAC

The **Remove NIC by MAC** operation removes a virtual NIC from the specified machine.

All of the operation's inputs except the following are described in *Common inputs in the integration*.

VMName

The virtual machine from which the NIC will be removed.

MAC

The MAC address of the NIC to be removed from the virtual machine. The MAC address consists of 12 hexadecimal digits, not separated (for example, **001100110011**).

The operation returns the following:

returnResult

An optional reference to the job that has been launched. If Hyper-V executes this operation immediately, a corresponding empty string is returned. Otherwise, the ID of the job is retrieved in the list and can be used for monitoring.

Notes:

- This feature is available for the release versions of Hyper-V for Windows Server 2008 and Windows Server 2008 R2.
- For all Hyper-V operations, using the built-in administrator account is highly recommended. To use a different user account that has administrator privileges assigned to it, you must disable User Account Control (UAC) even though this will reduce the system's security.

Troubleshooting

This section provides troubleshooting procedures and tools you can use to solve problems you may encounter while using this integration. It also includes a list of the error messages you may receive while using the integration and offers descriptions and possible fixes for the errors.

Errors messages

Some error messages are retrieved from the jobs started executing a certain operation and others are statically defined in the code. The most significant error messages that can be returned by the operations are the following:

Access is denied.

The provided credentials are not valid, or the user is not entitled to do the operation.

A timeout occurred.

A timeout occurred during the run.

A virtual machine with the given name already exists on the given Hyper-V server.

A virtual machine cannot be created if one with the same name already exists.

GetVirtualHardDiskInfo returned an invalid CIM_XML instance.

Trying to retrieve data about a virtual hard disk resulted in a result that can not be parsed.

Invalid MAC Address.

The MAC address should have 12 hexadigits, not separated by anything.

The dynamic VHD is in use. Stop the virtual machines that use it.

Operations cannot be run against a virtual hard disk that is in use.

The file already exists.

A VHD cannot be created at a location that already exists, because it would overwrite an existing file.

The file doesn't represent a dynamic VHD.

You cannot compact or expand a non-dynamic virtual hard disk.

The file doesn't represent a VHD.

The file at the indicated path is not a valid virtual hard disk.

The given job doesn't exist.

There is no job with the given ID.

The given path doesn't exist.

The operations with virtual harddisks (VHDs) have as input a local path to the physical place of the VHD files. If the location at the given path doesn’t exist, the above error message is thrown.

The given threshold doesn't have the requested format.

The threshold input should have the form dd/mm/yyyy hh:mm:ss

The given virtual machine doesn't have the given snapshot.

The indicated snapshot doesn’t exist for the virtual machine.

The indicated VHD is already connected to the virtual machine.

The same virtual hard disk cannot be connected twice at the same virtual machine.

The indicated virtual machine doesn't exist on the given Hyper-V server.

The named virtual machine doesn’t exist on the Hyper-V Server.

The indicated virtual machine is damaged and the operation can not succeed.

The virtual machine may have been damaged during an inadequate operation (forced turn-off, for example). In this case, the user cannot interact with the machine from either the Hyper-V interface or from the operations of the Operations Orchestration Hyper-V Integration pack.

The job is already stopped.

A job that is not started can not be stopped.

The machine can not be shutdown. It may not have the integration services component installed.

Some operations, such as Shutdown, require that Integrated Services be installed.

The system is in use.

The operation failed because the system is in use.

The system is out of memory.

The system does not have enough memory for this operation to succeed.

The value for the days is not valid.

The “days” values should be an integer higher than 0 and less than the number of days for the corresponding month.

The value for the hours is not valid.

The “hours” values should be an integer between 0 and 23.

The value for the minutes is not valid.

The “minutes” values should be an integer between 0 and 59.

The value for the months is not valid.

The “months” values should be an integer between 1 and 12.

The value for the seconds is not valid.

The “hours” values should be an integer between 0 and 59.

The value for the size should be an integer between 1 and 2048.

The size of the VHD is an integer between 1 and 2048 GB.

The value for the threshold in milliseconds is not valid.

The threshold input should be a positive integer, as it represents a number of milliseconds.

The values for the boot devices should be mutually different.

For “Change the Boot Order” operation, any two of the inputs indicating from where to boot first, second, third, and fourth should be different.

The virtual machine is stopped or the operating system version is not a Hyper-V supported one.

The operating system can be retrieved only if it is supported by Hyper-V and the virtual machine is running. Retrieving information about the processor usage also requires the machine to be started. Other operations (such as Start Virtual Machine) require the virtual machine to be stopped.

The virtual network doesn't exist and the operation can not succeed.

The indicated virtual network (switch) doesn’t exist.

The virtual port can not be created.

A virtual port on the virtual switch can not be created. Probably, the maximum number of ports was reached.

There is any device at the indicated position of the specified controller.

A device cannot be removed from a specified position of an IDE Controller to which the device is not attached.

There is no NIC with the given ID/MAC attached at the given virtual machine.

There is no NIC attached to the virtual machine having the given ID/MAC.

Customizing the integration

For each Hyper-V integration, create a new flow and add the corresponding inputs as written in the descriptions of the integration operations. They should run without any other supplemental configuration.

Security

The integrations use WMI for interacting with the Hyper-V Virtualization Server. All the remote operations are executed on the local system account. WMI uses the passed user credentials to authenticate the user, but does the actual operation using the local system account. As a result, UNC paths cannot be used with the WMI operations. For example, you can neither import nor export a virtual machine from a UNC path.

Tools

Following are OO tools that you can use with the Hyper-V integration:

- **RSFlowInvoke.exe** and **JRSFlowInvoke.jar**

  RSFlowInvoke (RSFlowInvoke.exe or the Java version, JRSFlowInvoke.jar) is a command-line utility that allows you to start a flow without using Central (although the Central service must be running). RSFlowInvoke is useful when you want to start a flow from an external system, such as a monitoring application that can use a command line to start a flow.

- **Web Services Wizard (wswizard.exe)**

  When you run the Web Services Wizard, you provide it with the WSDL for a given Web service. The WSDL string you provide as a pointer can be a file's location and name or a URL. The Web Services Wizard displays a list of the methods in the API of the Web service that you specify. When you run the wizard, pick the methods you want to use, and with one click for each method you have selected, the wizard creates an HP OO operation that can execute the method. This allows you to use the Web Services Wizard to create operations from your monitoring tool's API.

These tools are available in the Operations Orchestration home directory under the Studio/tools/ folder.