



# RVTools

*nice to have ware...*

[www.robware.net/rvtools](http://www.robware.net/rvtools)

Dell Technologies

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## **RVTools**

RVTools is a Windows .NET 4.7.2 application which uses VMware vSphere Management SDK 8.0 and CIS REST API to display information about your virtual environments.

Interacting with VirtualCenter 5.x, ESX Server 5.x, VirtualCenter 6.x, ESX Server 6.x, VirtualCenter 7.0, ESX server 7.0, VirtualCenter 8.0, and ESX server 8.0, RVTools is able to list information about VMs, CPU, Memory, Disks, Partitions, Network, CD drives, USB devices, Snapshots, VMware tools, vCenter server, Resource pools, Clusters, ESX hosts, HBAs, Nics, Switches, Ports, Distributed Switches, Distributed Ports, Service consoles, VM Kernels, Datastores, multipath info, license info, file info, and health checks.

The information can be exported to csv and xlsx file(s). With a xlsx merge utility it's possible to merge multiple vCenter xlsx reports to a single xlsx report.

## vInfo

The “vInfo” tab displays for each virtual machine: the virtual machine name, powerstate, template, SRM Placeholder, config status, DNS name, connection state, guest state, heartbeat, consolidation needed, power on date / time, suspended to memory, suspend date / time, suspend interval, creation date / time, change version, number of cpu’s, overall cpu readiness, amount of memory, active memory, number of nics, number of virtual disks, total disk capacity, fixed passthru hotplug, min Required EVC Mode Key, latency-sensitivity, op notification timeout, disk.EnableUUID, CBT, primary IP address, connected networks, number of monitors, video Ram KiB, resource pool, folder ID, folder name, vApp name, DAS protection, fault tolerance state, fault tolerance role, fault tolerance latency status, fault tolerance band width, fault tolerance secondary latency, virtual machine failover in progress, provisioned storage, used storage, unshared storage, HA restart priority, HA isolation response, HA VM Monitoring, Cluster rule(s), Cluster rule name(s), install Boot Required, Boot delay, Boot retry delay, Boot retry enabled, Boot BIOS setup, Reboot Poweroff, EFI Secure boot, Firmware, HW version, HW upgrade status, HW upgrade policy, HW target, configuration path, log directory, snapshot directory, suspend directory, annotation, custom fields, datacenter name, cluster name, ESX host name, operating system name according to the config file, operating system name according to the VMware tools, customization status info, guest detailed data, virtual machine ID, VM SMBIOS UUID, VM UUID, VI SDK server type, VI SDK API version, virtual machine tags, VI SDK Server and VI SDK UUID.

VM	Powerstate	Template	SRM Placeholder	Config status	DNS Name	Connection state	Guest state	Heartbeat	Consolidation Needed	PowerOn	Suspend time	Cre
DEBIAN	poweredOff	False	False	green		connected	notRunning	gray	False			2020
Debian_template	poweredOff	True	False	green		connected	notRunning	gray	False			2020
MARS	poweredOff	False	False	green		connected	notRunning	gray	False			2020
PLUTO	poweredOff	False	False	green		connected	notRunning	gray	False			2020
SATURNUS	poweredOn	False	False	green	WIN-TVIOR8KMJTH	connected	running	green	False	2021/01/29 16:40:55		2020
vCLS (1)	poweredOn	False	False	green	photon3-hdcs	connected	running	green	False	2021/01/19 20:02:23		2020
vCLS (2)	poweredOn	False	False	green	photon3-hdcs	connected	running	green	False	2021/01/22 15:15:03		2020
vCLS (3)	poweredOn	False	False	green	photon3-hdcs	connected	running	green	False	2021/01/19 20:02:27		2020
VENUS	poweredOff	False	False	green		connected	notRunning	gray	False			2020

## VM

Display name of the virtual machine (VM).

## Powerstate

This column lists the powerstate for a virtual machine: poweredOn, poweredOff, or suspended. This column does not model substates, such as when a task is running to change the virtual machine state. If the virtual machine is in a state with a task in progress, it transitions to a new state when the task completes. For example, a virtual machine continues to be in the poweredOn state while a suspend task is running, and changes to the suspended state once the task finishes.

NAME	DESCRIPTION
poweredOff	The virtual machine is currently powered off.

poweredOn	The virtual machine is currently powered on.
suspended	The virtual machine is currently suspended.

Template

Column which specifies if this is a template or not.

SRM Placeholder

Column which specifies if this is a SRM placeholder or not.

Config status

The config status indicates if the system has detected a configuration issue involving this VM. The meanings of the config status values are:

- red: A problem has been detected involving the entity.
- yellow: A problem is about to occur, or a transient condition has occurred (For example, reconfigure fail-over policy).
- green: No configuration issues have been detected.
- gray: The configuration status of the entity is not being monitored.

A green status indicates only that a problem has not been detected; it is not a guarantee that the entity is problem-free. Config issues are displayed on the vHealth tab page.

DNS Name

DNS name of the guest operating system, if known.

Connection state

Indicates if the virtual machine is available for management.

NAME	DESCRIPTION
connected	The server has access to the virtual machine.
disconnected	The server is currently disconnected from the virtual machine since its host is disconnected. See general comment for this enumerated type for more details.
inaccessible	One or more of the virtual machine configuration files are inaccessible. For example, this can be due to transient disk failures. In this case, no configuration can be returned for a virtual machine.
invalid	The virtual machine configuration format is invalid. Thus, it is accessible on disk, but corrupted in a way that does not allow the server to read the content. In this case, no configuration can be returned for a virtual machine.
orphaned	The virtual machine is no longer registered on the host it is associated with. For example, a virtual machine that is unregistered or deleted directly on a host managed by VirtualCenter shows up in this state.

Guest state

Operation mode of guest operating system. One of:

NAME	DESCRIPTION
running	Guest is running normally.



shuttingdown	Guest has a pending shutdown command.
resetting	Guest has a pending reset command
standby	Guest has a pending standby command.
notrunning	Guest is not running.
unknown	Guest information is not available.

### Heartbeat

The guest heartbeat. The heartbeat status is classified as:

NAME	DESCRIPTION
gray	The status is unknown.
green	The entity is OK.
red	The entity definitely has a problem.
yellow	The entity might have a problem.

### Consolidation Needed

Indicates if any disk of the virtual machine requires consolidation. This can happen when a snapshot is deleted but its associated disk is not committed back to the base disk.

**Since** vSphere API 5.0

### PowerOn

The timestamp when the virtual machine was most recently powered on.

This property is updated when the virtual machine is powered on from the poweredOff state and is cleared when the virtual machine is powered off. This property is not updated when a virtual machine is resumed from a suspended state.

### Suspended To Memory

Indicates whether the virtual machine is suspended to memory. **Since** vSphere API 7.0.2.0

### Suspend time

The timestamp when the virtual machine was most recently suspended. This property is updated every time the virtual machine is suspended.

### Suspend Interval

The total time the virtual machine has been suspended since it was initially powered on. This time excludes the current period if the virtual machine is currently suspended. This property is updated when the virtual machine resumes and is reset to zero when the virtual machine is powered off.

### Creation date

Creation date of a virtual machine represented in DateTime format.

This property is populated by the vCenter Server with the date and time of creation of the virtual machine.

### Change version

The changeVersion is a unique identifier for a given version of the configuration. Each change to the configuration updates this value. This is typically implemented as an ever-increasing count or a timestamp. However, a client should always treat this as an opaque string.

### CPU's

Number of processors in the virtual machine.

### Overall Cpu Readiness

Percentage of time that the virtual machine was ready but could not get scheduled to run on the physical CPU. Valid while the virtual machine is running.

**Since** vSphere API 7.0

### Memory

Memory size of the virtual machine (in MiBs).

### Active Memory

The amount of memory that was recently touched by the VM, in MiB.

**Since** vSphere API 7.0.3.0

### NIC's

Number of virtual network adapters. When RVTools is "connected" to the Virtual Center server this column has a value. When connected to an ESX host this column is "null"!

### Disks

Number of virtual disks. When RVTools is "connected" to the Virtual Center server this column has a value. When connected to an ESX host this column is "null"!

### Total Disk capacity in MiB

The sum of all "Capacity MiB" columns in the tab page vDisk for this VM.

### Fixed Passthru HotPlug

Indicates if support to add and remove fixed passthrough devices when the VM is running is enabled. **Since** 8.0.1.0

When the virtual machine is powered on, this indicates if support for hot adding and removing fixed passthrough devices was enabled prior to power on. Otherwise, it indicates whether it will be enabled when the VM is powered on.

### Min Required EVC Mode Key

For a powered-on or suspended virtual machine in a cluster with Enhanced VMotion Compatibility (EVC) enabled, this identifies the least-featured EVC mode (among those for the appropriate CPU vendor) that could admit the virtual machine. Until vSphere 6.5, this property will be unset if the virtual machine is powered off or is not in an EVC cluster.

This property may be used as a general indicator of the CPU feature baseline currently in use by the virtual machine. However, the virtual machine may be suppressing some of the features present in the CPU feature baseline of the indicated mode, either explicitly (in the virtual machine's configured `cpuFeatureMask`) or implicitly (in the default masks for the `GuestOsDescriptor` appropriate for the virtual machine's configured guest OS).

#### Latency-sensitivity

The latency-sensitivity of the virtual machine.

#### Op Notification Timeout

Operation notification timeout in seconds. Specifies the maximum time duration the application may take to prepare for the operation after it has been notified. This property is set only for powered on VMs. **Since** 8.0.0.1

#### EnableUUID

`disk.EnableUUID` value. True=Application-Consistent, False=Crash-Consistent

#### CBT

Changed Block Tracking (CBT) Boolean

#### Primary IP Address

Primary IP address assigned to the guest operating system, if known.

#### Network #1 to #8

Connected networks.

#### Num Monitors

Indicates the number of supported monitors. The number of displays X the maximum resolution of each display is bounded by the video RAM size of the virtual video card.

#### Video Ram KiB

The size of the framebuffer for a virtual machine.

#### Resource pool name

The current resource pool name that specifies resource allocation for this virtual machine.

#### Folder ID

The id of the folder where the VM is placed.

#### Folder

The name of the folder where the VM is placed. By default, folder name is not visible because it's a performance killer. You can change the default behavior by changing the preferences. See menu, Edit, Preferences

#### vApp

The vApp name. By default, vApp name is not visible because it's a performance killer. You can change the default behavior by changing the preferences. See menu, Edit, Preferences

### DAS Protection

Indicates if vSphere HA is protecting a virtual machine (VM).

### FT state

The fault tolerance state of the virtual machine.

NAME	DESCRIPTION
disabled	For a virtual machine that is the primary in a fault tolerant group, this state indicates that the virtual machine has at least one registered secondary, but no secondary is enabled. For a virtual machine that is the secondary in a fault tolerant group, this state indicates that the secondary is disabled.
enabled	For a virtual machine that is the primary in a fault tolerant group, this state indicates that the virtual machine is not currently powered on, but has at least one enabled secondary. For a virtual machine that is the secondary in a fault tolerant group, this state indicates that the secondary is enabled, but is not currently powered on.
needSecondary	For a virtual machine that is the primary in a fault tolerant group, this state indicates that the virtual machine is powered on and has at least one enabled secondary, but no secondary is currently active. This state is not valid for a virtual machine that is a secondary in a fault tolerant group.
notConfigured	This state indicates that the virtual machine has not been configured for fault tolerance.
running	This state indicates that the virtual machine is running with fault tolerance protection.
starting	For a virtual machine that is the primary in a fault tolerant group, this state indicates that the virtual machine is powered on and has at least one secondary that is synchronizing its state with the primary. For a virtual machine that is the secondary in a fault tolerant group, this state indicates that the secondary is powered on and is synchronizing its state with the primary virtual machine.

### FT Role

The index of the current VM in instanceUuids array starting from 1, so 1 means that it is the primary VM.

### FT Latency

The latency status of the fault tolerance VM. ftLatencyStatus is determined by the value of ftSecondaryLatency: green, if ftSecondaryLatency is less than or equal to 2 seconds; yellow, if ftSecondaryLatency is greater than 2 seconds and less than or equal to 6 seconds; red, if ftSecondaryLatency is greater than 6 seconds; gray, if ftSecondaryLatency is unknown.

### FT Bandwidth

The network bandwidth used for logging between the primary and secondary fault tolerance VMs. The unit is kilobytes per second.

### FT Sec. Latency

The amount of time (in milliseconds) that the vCPU of the secondary fault tolerance VM runs behind the vCPU of the primary VM.

### Vm Failover In Progress

Represents if the VM is currently being failed over by vSphere Fault Domain Manager (FDM). **Since** vSphere API 7.0.2

### Provisioned MiB

Total storage space (in MiBs) committed to this virtual machine across all datastores. Essentially an aggregate of the provisioned storage committed across all datastores for this virtual machine.

### In use MiB

Storage space (in MiBs) in use by this virtual machine on all datastores.

### Unshared MiB

Total storage space (in MiBs) occupied by the virtual machine across all datastores, that is not shared with any other virtual machine.

### HA Restart Priority

Restart priority for a virtual machine. If not specified at either the cluster level or the virtual machine level, this will default to medium.

NAME	DESCRIPTION
clusterRestartPriority	Virtual machines with this priority use the default restart priority defined for the cluster that contains this virtual machine.
disabled	vSphere HA is disabled for this virtual machine.
high	Virtual machines with this priority have a higher chance of powering on after a failure if there is insufficient capacity on hosts to meet all virtual machine needs.
low	Virtual machines with this priority have a lower chance of powering on after a failure if there is insufficient capacity on hosts to meet all virtual machine needs.
medium	Virtual machines with this priority have an intermediate chance of powering on after a failure if there is insufficient capacity on hosts to meet all virtual machine needs.

### HA Isolation Response

Indicates if the virtual machine should be powered off if a host determines that it is isolated from the rest of the compute resource. If not specified at either the cluster level or the virtual machine level, this will default to powerOff.

NAME	DESCRIPTION
clusterIsolationResponse	Use the default isolation response defined for the cluster that contains this virtual machine.
none	Do not power off the virtual machine in the event of a host network isolation.
powerOff	Power off the virtual machine in the event of a host network isolation.
shutdown	<p>Shut down the virtual machine guest operating system in the event of a host network isolation. If the guest operating system fails to shutdown within five minutes, HA will initiate a forced power off.</p> <p>When you use the shutdown isolation response, failover can take longer (compared to the powerOff response) because the virtual machine cannot fail over until it is shutdown.</p>

### HA VM Monitoring

Level of HA Virtual Machine Health Monitoring Service. You can monitor both guest and application heartbeats, guest heartbeats only, or you can disable the service.

### Cluster rules

This value will show you the affinity and anti-affinity rules which are defined for this VM.

#### Cluster rule names

This value will show you the name(s) of the affinity and anti-affinity rules which are defined for this VM.

#### Boot required

Specifies if the VM needs an initial boot before the deployment is complete.

#### Boot delay

Delay (in milliseconds) before starting the boot sequence. The boot delay specifies a time interval between virtual machine power on or restart and the beginning of the boot sequence.

#### Boot retry delay

Delay (in milliseconds) before a boot retry. The boot retry delay specifies a time interval between virtual machine boot failure and the subsequent attempt to boot again. The virtual machine uses this value only if bootRetryEnabled is true.

#### Boot retry enabled

If set to true, a virtual machine that fails to boot will try again after the bootRetryDelay time period has expired. When false, the virtual machine waits indefinitely for you to initiate boot retry.

#### Boot BIOS setup

If set to true, the virtual machine automatically enters BIOS setup the next time it boots. The virtual machine resets this flag to false so that subsequent boots proceed normally.

#### Reboot Poweroff

Indicates if the next reboot will result in a power off.

#### EFI Secure boot

If set to true, the virtual machine's firmware will perform signature checks of any EFI images loaded during startup, and will refuse to start any images which do not pass those signature checks.

#### Firmware

Information about firmware type for this virtual machine. Possible values are:

bios    BIOS firmware  
efi     Extensible Firmware Interface

#### HW version

Virtual hardware version.

#### HW upgrade status

Status for last attempt to run scheduled hardware upgrade.

failed        Upgrade failed.  
none         No scheduled upgrade ever happened.

pending Upgrade is scheduled, but was not run yet.  
success Upgrade succeeded.

### HW upgrade policy

Scheduled hardware upgrade policy setting for the virtual machine.

NAME	DESCRIPTION
always	Always run scheduled upgrades.
never	No scheduled upgrades.
onSoftPowerOff	Run scheduled upgrades only on normal guest OS shutdown.

### HW target

Key for target hardware version to be used on next scheduled upgrade.

### Path

Path name to the configuration file for the virtual machine.

### Log directory

Directory to store the log files for the virtual machine. If not specified, this defaults to the same directory as the configuration file.

### Snapshot directory

Path name of the directory that holds suspend and snapshot files belonging to the virtual machine. Prior to vSphere 5.0, this directory also holds snapshot redo files. Starting with vSphere 5.0, the redo files will stay in the same directory as the snapshot disk, thus this directory will no longer hold the snapshot redo files. This path name defaults to the same directory as the configuration file.

### Suspend directory

Some products allow the suspend directory to be different than the snapshot directory. On products where this is not possible, setting of this property is ignored.

### Annotation

Description for the virtual machine.

### Custom Fields

The custom fields which you have defined.

### Datacenter

The name of the datacenter where the VM is running.

### Cluster

The name of the cluster where the VM is running.

### Host

The host that is responsible for running a virtual machine. This property is null when the virtual machine is not running and is not assigned to run on a particular host.

OS according to the configuration file

This is the full name of the guest operating system for the virtual machine according to the configuration file.

OS according to the VMware Tools

This is the full name of the guest operating system for the virtual machine according to the VMware Tools.

Customization Info

Guest OS Customization status info. **Since** vSphere API 7.0.2.0

This property can have one of the following values:

NAME	DESCRIPTION
IDLE	No guest customizationSpec has been applied for the VM
PENDING	The guest customizationSpec has been applied for the VM, but the customization process has not yet started inside the guest OS
RUNNING	The customization process is currently running inside the guest OS
SUCCEEDED	The customization process has completed successfully inside the guest OS
FAILED	The customization process has failed inside the guest OS

Guest Detailed Data

Guest OS Detailed data. The guest detailed data string is a property list (space separated, name='value' pairs where the value is embedded in single quotes) of metadata provided by the guest OS when sufficiently recent tools are installed. The fields supplied will vary between distributions and distribution versions. The order of these fields is not guaranteed. **Since** 8.0.2.0

Available fields:

NAME	DESCRIPTION
architecture	'Arm' or 'X86'
bitness	'32' or '64'
buildNumber	OS build number
cpeString	NIST Common Platform Enumeration Specification string, a standardized identifier for the OS
distroAddlVersion	Longer OS version string that may contain additional info (e.g. version name)
distroName	OS distribution name
familyName	OS family name (Windows, Linux, etc.)
kernelVersion	Linux kernel version, Windows 10+ patch number, or Windows build number
prettyName	Officially specified distro "pretty name"

VM ID

Object ID which can be used to find the VM when you browse the VI SDK.

SMBIOS UUID

Virtual machine BIOS identification.

VM UUID

VirtualCenter-specific 128-bit UUID of a virtual machine, represented as a hexadecimal string. This identifier is used by VirtualCenter to uniquely identify all virtual machine instances, including those that may share the same SMBIOS UUID.



VI SDK Server type

The complete product name, including the version information.

VI SDK API Version

The version of the API.

Virtual machine tags

Since version vSphere 6.5, tag information can be read from the CIS Rest API. Tags are only visible in RVTools when logged on with userid/password.

VI SDK Server

VI SDK Server which is used by RVTools to gather the information.

VI SDK UUID

A globally unique identifier associated with this service instance.

## vCpu

The “vCpu” tab displays for each virtual machine: the name of the VM, powerstate, template, SRM Placeholder, number of cpu’s, number of sockets, number of cores per socket, max cpu, overall cpu usage, level, shares, reservation, static cpu entitlement, distributed cpu entitlement, limit, hot add value, hot remove value, Numa Hotadd Exposed, annotations, custom fields, datacenter name, cluster name, ESX host name, VM folder name, operating system name according to the config file, operating system name according to the VMware tools, VM ID, VM UUID, virtual machine tags, VI SDK Server and VI SDK UUID.

VM	Powerstate	Template	SRM Placeholder	CPUs	Sockets	Cores p/s	Max	Overall	Level	Shares	Reservation	Entitlement	DRS Entitlement	Limit	Hot Add
DEBIAN	poweredOff	False	False	1	1	1	0	0	normal	1.000	0	0	0	-1	False
Debian_template	poweredOff	True	False	1	1	1	0	0	normal	1.000	0	0	0	-1	False
MARS	poweredOn	False	False	1	1	1	0	0	normal	1.000	0	0	0	-1	False
PLUTO	poweredOff	False	False	1	1	1	0	0	normal	1.000	0	0	0	-1	False
SATURNUS	poweredOn	False	False	1	1	1	3.800	0	normal	1.000	0	3.800	0	-1	False
vCLS (1)	poweredOn	False	False	1	1	1	0	0	normal	1.000	0	0	0	-1	False
vCLS (2)	poweredOn	False	False	1	1	1	0	0	normal	1.000	0	0	0	-1	False
vCLS (3)	poweredOn	False	False	1	1	1	0	0	normal	1.000	0	0	0	-1	False
VENUS	poweredOff	False	False	1	1	1	0	0	normal	1.000	0	0	0	-1	False

## VM

Display name of the virtual machine.

## Powerstate

This column lists the powerstate for a virtual machine: poweredOn, poweredOff, or suspended. This column does not model substates, such as when a task is running to change the virtual machine state. If the virtual machine is in a state with a task in progress, it transitions to a new state when the task completes. For example, a virtual machine continues to be in the poweredOn state while a suspend task is running, and changes to the suspended state once the task finishes.

NAME	DESCRIPTION
poweredOff	The virtual machine is currently powered off.
poweredOn	The virtual machine is currently powered on.
suspended	The virtual machine is currently suspended.

## Template

Column which specifies if this is a template or not.

## SRM Placeholder

Column which specifies if this is a SRM placeholder or not.

## CPU's

Total number of virtual processors in the virtual machine.

### Sockets

Number of virtual sockets in the virtual machine.

### Cores p/s

Number of cores per socket.

### Max

Current upper-bound on CPU usage. The upper-bound is based on the host the virtual machine is current running on, as well as limits configured on the virtual machine itself or any parent resource pool. Valid while the virtual machine is running.

### Overall

Basic CPU performance statistics, in MHz. Valid while the virtual machine is running.

### Level

The allocation level is a simplified view of shares. Levels map to a pre-determined set of numeric values for shares. If the shares value does not map to a predefined size, then the level is set as custom.

### Shares

The number of shares allocated. Used to determine resource allocation in case of resource contention. This value is only set if level is set to custom. If level is not set to custom, this value is ignored. Therefore, only shares with custom values can be compared.

### Reservation

Amount of resource that is guaranteed available to the virtual machine or resource pool. Reserved resources are not wasted if they are not used. If the utilization is less than the reservation, the resources can be utilized by other running virtual machines. Units are MiB for memory, MHz for CPU.

### Entitlement

The static CPU resource entitlement for a virtual machine. This value is calculated based on this virtual machine's resource reservations, shares and limit, and doesn't take into account current usage. This is the worst case CPU allocation for this virtual machine, that is, the amount of CPU resource this virtual machine would receive if all virtual machines running in the cluster went to maximum consumption. Units are MHz.

### DRS Entitlement

This is the amount of CPU resource, in MHz, that this VM is entitled to, as calculated by DRS. Valid only for a VM managed by DRS.

### Limit

The utilization of a virtual machine/resource pool will not exceed this limit, even if there are available resources. This is typically used to ensure a consistent performance of virtual machines / resource pools independent of available resources. If set to -1, then there is no fixed limit on resource usage (only bounded by available resources and shares). Units are MiB for memory, MHz for CPU.

Hot Add

Indicates if virtual processors can be added while this virtual machine is running.

Hot Remove

Indicates if virtual processors can be removed while this virtual machine is running.

Numa Hotadd Exposed

Indicates if virtual NUMA topology is exposed when CPU hotadd is enabled.

Annotation

Description for the virtual machine.

Custom Fields

The custom fields which you have defined.

Datacenter

The name of the datacenter where the VM is running.

Cluster

The name of the cluster where the VM is running.

Host

The host that is responsible for running a virtual machine. This property is null when the virtual machine is not running and is not assigned to run on a particular host.

Folder

The name of the folder where the VM is placed. By default not visible because it's a performance killer. You can change the default behavior by changing the preferences. See menu, Edit, Preferences

OS according to the configuration file

This is the full name of the guest operating system for the virtual machine according to the configuration file.

OS according to the VMware Tools

This is the full name of the guest operating system for the virtual machine according to the VMware Tools.

VM ID

Object ID which can be used to find the VM when you browse the VI SDK.

VM UUID

VirtualCenter-specific 128-bit UUID of a virtual machine, represented as a hexadecimal string. This identifier is used by VirtualCenter to uniquely identify all virtual machine instances, including those that may share the same SMBIOS UUID.

VI SDK Server

VI SDK Server which is used by RVTools to gather the information.

Virtual machine tags

Since version vSphere 6.5, tag information can be read from the CIS Rest API. Tags are only visible in RVTools when logged on with userid/password.

VI SDK UUID

A globally unique identifier associated with this service instance.

## vMemory

The “vMemory” tab displays for each virtual machine: the name of the VM, powerstate, template, SRM Placeholder, memory size, Memory Reservation Locked To Max, memory overhead, max memory usage, consumed memory, consumed overhead, private memory, shared memory, swapped memory, ballooned memory, active memory, entitlement memory, distributed memory entitlement, level, shares, reservations , limit, hot add, annotations, custom fields, datacenter name, cluster name, ESX host name, VM folder name, operating system name according to the config file, operating system name according to the VMware tools, VM ID, VM UUID, virtual machine tags, VI SDK Server and VI SDK UUID.

VM	Powerstate	Template	SRM Placeholder	Size MB	Memory Reservation Locked To Max	Overhead	Max	Consumed	Consumed Overhead	Private	Shared	Swapped	Ballooned
DEBIAN	poweredOff	False	False	256	False	0	0	0	0	0	0	0	0
Debian_Template	poweredOff	True	False	256	False	0	0	0	0	0	0	0	0
MARS	poweredOff	False	False	256	False	0	0	0	0	0	0	0	0
PLUTO	poweredOff	False	False	256	False	0	0	0	0	0	0	0	0
SATURNUS	poweredOn	False	False	512	False	0	304	548	36	512	0	0	0
vCLS (1)	poweredOn	False	False	128	False	0	0	0	0	0	0	0	0
vCLS (2)	poweredOn	False	False	128	False	0	0	0	0	0	0	0	0
vCLS (3)	poweredOn	False	False	128	False	0	0	0	0	0	0	0	0
VENUS	poweredOff	False	False	256	False	0	0	0	0	0	0	0	0

## VM

Display name of the virtual machine.

## Powerstate

This column lists the powerstate for a virtual machine: poweredOn, poweredOff, or suspended. This column does not model substates, such as when a task is running to change the virtual machine state. If the virtual machine is in a state with a task in progress, it transitions to a new state when the task completes. For example, a virtual machine continues to be in the poweredOn state while a suspend task is running, and changes to the suspended state once the task finishes.

NAME	DESCRIPTION
poweredOff	The virtual machine is currently powered off.
poweredOn	The virtual machine is currently powered on.
suspended	The virtual machine is currently suspended.

## Template

Column which specifies if this is a template or not.

## SRM Placeholder

Column which specifies if this is a SRM placeholder or not.

## Size MiB

Memory size of the virtual machine, (in MiBs).

### Memory Reservation Locked To Max

If set true, memory resource reservation for this virtual machine will always be equal to the virtual machine's memory size; increases in memory size will be rejected when a corresponding reservation increase is not possible.

### Overhead

The amount of memory resource (in MiBs) that will be used by the virtual machine above its guest memory requirements. This value is set if and only if the virtual machine is registered on a host that supports memory resource allocation features. For powered off VMs, this is the minimum overhead required to power on the VM on the registered host.

### Max

Current upper-bound on memory usage (in MiBs). The upper-bound is based on memory configuration of the virtual machine, as well as limits configured on the virtual machine itself or any parent resource pool. Valid while the virtual machine is running.

### Consumed

Host memory utilization statistics (in MiBs). This is also known as consumed host memory. This is between 0 and the configured resource limit. Valid while the virtual machine is running. This includes the overhead memory of the VM.

### Consumed overhead

The amount of consumed overhead memory (in MiBs) for this VM. **Since** vSphere API 4.0

### Private

The portion of memory (in MiBs) that is granted to this VM from non-shared host memory. **Since** vSphere API 4.0

### Shared

The portion of memory (in MiBs) that is granted to this VM from host memory shared between VMs. **Since** vSphere API 4.0

### Swapped

The portion of memory (in MiBs) that is granted to this VM from the host's swap space. This is a sign that there is memory pressure on the host. **Since** vSphere API 4.0

### Ballooned

The size of the balloon driver in the VM (in MiBs). The host will inflate the balloon driver to reclaim physical memory from the VM. This is a sign that there is memory pressure on the host. **Since** vSphere API 4.0

### Active

Guest memory utilization statistics (in MiBs). This is also known as active guest memory. The number can be between 0 and the configured memory size of the virtual machine. Valid while the virtual machine is running.

### Entitlement

The static memory resource entitlement for a virtual machine. This value is calculated based on this virtual machine's resource reservations, shares and limit, and doesn't take

into account current usage. This is the worst-case memory allocation for this virtual machine, that is, the amount of memory this virtual machine would receive if all virtual machines running in the cluster went to maximum consumption. Units are MiB. **Since** vSphere API 4.0

#### DRS Entitlement

This is the amount of memory (in MiBs) that this VM is entitled to, as calculated by DRS. Valid only for a VM managed by DRS.

#### Level

The allocation level is a simplified view of shares. Levels map to a pre-determined set of numeric values for shares. If the shares value does not map to a predefined size, then the level is set as custom.

#### Shares

The number of shares allocated. Used to determine resource allocation in case of resource contention. This value is only set if level is set to custom. If level is not set to custom, this value is ignored. Therefore, only shares with custom values can be compared.

#### Reservation

Amount of resource that is guaranteed available to the virtual machine or resource pool. Reserved resources are not wasted if they are not used. If the utilization is less than the reservation, the resources can be utilized by other running virtual machines. Units are MiB for memory, MHz for CPU.

#### Limit

The utilization of a virtual machine/resource pool will not exceed this limit, even if there are available resources. This is typically used to ensure a consistent performance of virtual machines / resource pools independent of available resources. If set to -1, then there is no fixed limit on resource usage (only bounded by available resources and shares). Units are MiB for memory, MHz for CPU.

#### Hot Add

Indicates if memory can be added while this virtual machine is running.

#### Annotation

Description for the virtual machine.

#### Custom Fields

The custom fields which you have defined.

#### Datacenter

The name of the datacenter where the VM is running.

#### Cluster

The name of the cluster where the VM is running.



### Host

The host that is responsible for running a virtual machine. This property is null when the virtual machine is not running and is not assigned to run on a particular host.

### Folder

The name of the folder where the VM is placed. By default not visible because it's a performance killer. You can change the default behavior by changing the preferences. See menu, Edit, Preferences

### OS according to the configuration file

This is the full name of the guest operating system for the virtual machine according to the configuration file.

### OS according to the VMware Tools

This is the full name of the guest operating system for the virtual machine according to the VMware Tools.

### VM ID

Object ID which can be used to find the VM when you browse the VI SDK.

### VM UUID

VirtualCenter-specific 128-bit UUID of a virtual machine, represented as a hexadecimal string. This identifier is used by VirtualCenter to uniquely identify all virtual machine instances, including those that may share the same SMBIOS UUID.

### Virtual machine tags

Since version vSphere 6.5, tag information can be read from the CIS Rest API. Tags are only visible in RVTools when logged on with userid/password.

### VI SDK Server

VI SDK Server which is used by RVTools to gather the information.

### VI SDK UUID

A globally unique identifier associated with this service instance.

## vDisk

The “vDisk” tab displays for each virtual machine: name of VM, powerstate, template, SRM Placeholder, all the virtual disks, Disk Key, Disk UUID, Disk path, Disk total disk capacity, raw switch, disk persistence mode, sharing mode, thin provisioned flag, eagerly scrub flag, split flag, write through, level, shares value, reservation, limit, SCSI controller, SCSI label, unit number, sharedBus, vmdk path, raw LUN ID, raw compatibility mode, Internal sort column, annotations, custom fields, datacenter name, cluster name, ESX host name, VM folder name, operating system name according to the config file, operating system name according to the VMware tools, VM ID, VM UUID, virtual machine tags, VI SDK Server and VI SDK UUID.

VM	Powerstate	Template	SRM Placeholder	Disk	Disk Key	Disk Path	Capacity MB	Raw	Disk Mode	Thin	Eagerly Scrub	Split	Write Through	Level	Sha
DEBIAN	poweredOff	False	False	Hard disk 1	3000		256	False	persistent	True	False	False	False	normal	
Debian_Template	poweredOff	True	False	Hard disk 1	3000		256	False	persistent	True	False	False	False	normal	
MARS	poweredOff	False	False	Hard disk 1	3000		256	False	persistent	True	False	False	False	normal	
PLUTO	poweredOff	False	False	Hard disk 1	3000		256	False	persistent	True	False	False	False	normal	
SATURNUS	poweredOn	False	False	Hard disk 2	2000	C:\	40.960	False	persistent	True	False	False	False	normal	
SATURNUS	poweredOn	False	False	Hard disk 3	2001	E:\	100	False	persistent	True	False	False	False	normal	
SATURNUS	poweredOn	False	False	Hard disk 1	2002	F:\, G:\	256	False	persistent	True	False	False	False	normal	
vCLS (1)	poweredOn	False	False	Hard disk 1	2000	././boot/efi	2.048	False	persistent	True	False	False	False	normal	
vCLS (2)	poweredOn	False	False	Hard disk 1	2000	././boot/efi	2.048	False	persistent	True	False	False	False	normal	
vCLS (3)	poweredOn	False	False	Hard disk 1	2000	././boot/efi	2.048	False	persistent	True	False	False	False	normal	
VENUS	poweredOff	False	False	Hard disk 1	3000		256	False	persistent	True	False	False	False	normal	

## VM

Display name of the virtual machine.

## Powerstate

This column lists the powerstate for a virtual machine: poweredOn, poweredOff, or suspended. This column does not model substates, such as when a task is running to change the virtual machine state. If the virtual machine is in a state with a task in progress, it transitions to a new state when the task completes. For example, a virtual machine continues to be in the poweredOn state while a suspend task is running, and changes to the suspended state once the task finishes.

NAME	DESCRIPTION
poweredOff	The virtual machine is currently powered off.
poweredOn	The virtual machine is currently powered on.
suspended	The virtual machine is currently suspended.

## Template

Column which specifies if this is a template or not.

## SRM Placeholder

Column which specifies if this is a SRM placeholder or not.

## Disk

Name of the virtual disk.

### Disk Key

A unique key that distinguishes this device from other devices in the same virtual machine.

### Disk UUID

Disk UUID for the virtual disk, if available.

### Disk Path

Name of the virtual disk in the guest operating system. For example: C:\ (only works for vSphere >= 7.0)

### Capacity MiB

Total capacity of the disk (in MiBs). This is part of the virtual machine configuration.

### Raw

Switch which defines if the disk is raw or not.

### Disk Mode

The disk persistence mode. Valid modes are:

NAME	DESCRIPTION
append	Changes are appended to the redo log; you revoke changes by removing the undo log.
independent_nonpersistent	Same as nonpersistent, but not affected by snapshots.
independent_persistent	Same as persistent, but not affected by snapshots.
nonpersistent	Changes to virtual disk are made to a redo log and discarded at power off.
persistent	Changes are immediately and permanently written to the virtual disk.
undoable	Changes are made to a redo log, but you are given the option to commit or undo.

### Sharing mode

The sharing mode of the virtual disk.

NAME
sharingMultiWriter
sharingNone

### Thin

Flag to indicate to the underlying filesystem if the virtual disk backing file should be allocated lazily (using thin provisioning). This flag is only used for file systems that support configuring the provisioning policy on a per file basis, such as VMFS3.

### Eagerly Scrub

Flag to indicate to the underlying file system if the virtual disk backing file should be scrubbed completely at this time.

Virtual disks on some file systems like VMFS3 are zeroed out lazily so that disk creation time doesn't take too long. However, clustering applications and features like Fault Tolerance require that the virtual disk be completely scrubbed. This setting allows controlling the scrubbing policy on a per-disk basis. If this flag is unset or set to false, the disk scrubbing policy will be decided by the file system. **Since** vSphere API 4.0

### Split

Flag to indicate the type of virtual disk file: split or monolithic. If true, the virtual disk is stored in multiple files, each 2GB

### Write Through

Indicates if writes should go directly to the file system or should be buffered.

### Level

The allocation level is a simplified view of shares. Levels map to a pre-determined set of numeric values for shares. If the shares value does not map to a predefined size, then the level is set as custom.

### Shares

Shares are used in case of resource contention. The value should be within a range of 200 to 4000. While setting shares for storage I/O resource, if the property is unset, it is treated as no change and the property is not updated. While reading back the shares information of storage I/O resource, if the property is unset, a default value of level = normal, shares = 1000 will be returned.

### Reservations

Reservation control is used to provide guaranteed allocation in terms of IOPS. Large IO sizes are considered as multiple IOs using a chunk size of 32 KiB as default. This control is initially supported only at host level for local datastores. In future, it may get supported on shared storage based on integration with Storage IO Control. Also right now we don't do any admission control based on IO reservation values. **Since** vSphere API 5.5.

### Limit

The utilization of a virtual machine will not exceed this limit, even if there are available resources. This is typically used to ensure a consistent performance of virtual machines independent of available resources. If set to -1, then there is no fixed limit on resource usage (only bounded by available resources and shares). The unit is number of I/O per second. While setting the limit for storage I/O resource, if the property is unset, it is treated as no change and the property is not updated. While reading back the limit information of storage I/O resource, if the property is unset, a default value of -1 will be returned, which indicates that there is no limit on resource usage.

### Controller

Name of SCSI controller.

*Two IDE adapters and a SCSI adapter are installed in the virtual machine. The IDE adapter is always ATAPI. For the SCSI adapter, you can choose between a BusLogic or LSI Logic SCSI adapter. In the Select I/O Adapter Types page, the default for your guest operating system is already selected. Older guest operating systems default to the BusLogic adapter. The LSI Logic adapter has improved performance, works better with non-disk SCSI devices, and is included with Windows Server 2003.*

Source: [http://www.vmware.com/pdf/vi3\\_35/esx\\_3/r35u2/vi3\\_35\\_25\\_u2\\_admin\\_guide.pdf](http://www.vmware.com/pdf/vi3_35/esx_3/r35u2/vi3_35_25_u2_admin_guide.pdf)

**SCSI label**

SCSI display label.

**Unit number**

The unit number of the SCSI controller. The SCSI controller sits on its own bus, so this field defines which slot the controller is using.

**SharedBus**

Mode for sharing the SCSI bus. The modes are physical Sharing, virtual Sharing, and no Sharing.

**Path**

VMDK file name.

**Raw LUN ID**

Unique identifier of the LUN accessed by the raw disk mapping.

**Raw Comp. Mode**

The compatibility mode of the raw disk mapping (RDM). This must be specified when a new virtual disk with an RDM backing is created. On subsequent virtual machine reconfigurations, this property should be handled as follows, depending on the version of the host:

On ESX Server 2.5, the compatibility mode of an RDM backing is a characteristic of the virtual machine's configuration. When reconfiguring a virtual machine that currently uses a virtual disk backed by an RDM, the compatibility mode of that backing may be modified. When reconfiguring a virtual machine to add an existing virtual disk backed by an RDM, the compatibility mode of that backing may be specified. If left unspecified it defaults to "physicalMode".

On ESX Server 3.x, the compatibility mode of an RDM backing is a characteristic of the RDM itself. Once the RDM is created, its compatibility mode cannot be changed by reconfiguring the virtual machine. When reconfiguring a virtual machine to add an existing virtual disk backed by an RDM, the compatibility mode of that backing must be left unspecified.

NAME	DESCRIPTION
physicalMode	A disk device backed by a physical compatibility mode raw disk mapping cannot use disk modes, and commands are passed straight through to the LUN indicated by the raw disk mapping.
virtualMode	A disk device backed by a virtual compatibility mode raw disk mapping can use disk modes.

**Internal Sort Column**

Internally used to sort the data.

Annotation

Description for the virtual machine.

Custom Fields

The custom fields which you have defined.

Datacenter

The name of the datacenter where the VM is running.

Cluster

The name of the cluster where the VM is running.

Host

The host that is responsible for running a virtual machine. This property is null when the virtual machine is not running and is not assigned to run on a particular host.

Folder

The name of the folder where the VM is placed. By default not visible because it's a performance killer. You can change the default behavior by changing the preferences. See menu, Edit, Preferences

OS according to the configuration file

This is the full name of the guest operating system for the virtual machine according to the configuration file.

OS according to the VMware Tools

This is the full name of the guest operating system for the virtual machine according to the VMware Tools.

VM ID

Object ID which can be used to find the VM when you browse the VI SDK.

VM UUID

VirtualCenter-specific 128-bit UUID of a virtual machine, represented as a hexadecimal string. This identifier is used by VirtualCenter to uniquely identify all virtual machine instances, including those that may share the same SMBIOS UUID.

Virtual machine tags

Since version vSphere 6.5, tag information can be read from the CIS Rest API. Tags are only visible in RVTools when logged on with userid/password.

VI SDK Server

VI SDK Server which is used by RVTools to gather the information.

VI SDK UUID

A globally unique identifier associated with this service instance.

## vPartition

The “vPartition” tab displays for each virtual machine, if the VMware Tools are active: the name of the VM, powerstate, template, SRM Placeholder, Disk Key, Disk name, total disk capacity, consumed disk capacity, total free disk capacity, percentage free disk capacity, Internal sort column, annotations, custom fields, datacenter name, cluster name, ESX host name, VM folder name, operating system name according to the config file, operating system name according to the VMware tools, VM ID, VM UUID, virtual machine tags, VI SDK Server and VI SDK UUID.

VM	Powerstate	Template	SRM Placeholder	Disk Key	Disk	Capacity MB	Consumed MIB	Free MB	Free %	Internal Sort Column	Annotation
SATURNUS	poweredOn	False	False	2000	C:\	40.607	8.377	32.230	79	SATURNUS 2000	
SATURNUS	poweredOn	False	False	2001	E:\	96	14	82	85	SATURNUS 2001	
SATURNUS	poweredOn	False	False	2002	F:\	99	14	85	85	SATURNUS 2002	
SATURNUS	poweredOn	False	False	2002	G:\	152	14	138	90	SATURNUS 2002	
vCLS (1)	poweredOn	False	False	2000	/boot/efi	9	2	7	78	vCLS (1) 2000	vSphere Cluster Services VM is deployed from an OVA with
vCLS (1)	poweredOn	False	False	2000	/	1.968	608	1.360	69	vCLS (1) 2000	vSphere Cluster Services VM is deployed from an OVA with
vCLS (2)	poweredOn	False	False	2000	/boot/efi	9	2	7	78	vCLS (2) 2000	vSphere Cluster Services VM is deployed from an OVA with
vCLS (2)	poweredOn	False	False	2000	/	1.968	584	1.384	70	vCLS (2) 2000	vSphere Cluster Services VM is deployed from an OVA with
vCLS (3)	poweredOn	False	False	2000	/boot/efi	9	2	7	78	vCLS (3) 2000	vSphere Cluster Services VM is deployed from an OVA with
vCLS (3)	poweredOn	False	False	2000	/	1.968	584	1.384	70	vCLS (3) 2000	vSphere Cluster Services VM is deployed from an OVA with

## VM

Display name of the virtual machine.

## Powerstate

This column lists the powerstate for a virtual machine: poweredOn, poweredOff, or suspended. This column does not model substates, such as when a task is running to change the virtual machine state. If the virtual machine is in a state with a task in progress, it transitions to a new state when the task completes. For example, a virtual machine continues to be in the poweredOn state while a suspend task is running, and changes to the suspended state once the task finishes.

NAME	DESCRIPTION
poweredOff	The virtual machine is currently powered off.
poweredOn	The virtual machine is currently powered on.
suspended	The virtual machine is currently suspended.

## Template

Column which specifies if this is a template or not.

## SRM Placeholder

Column which specifies if this is a SRM placeholder or not.

## Disk Key

Disk key can be used to map vDisk disk with disk partition.

## Disk

Name of the virtual disk in the guest operating system. For example: C:\

Capacity MiB

Total capacity of the disk (in MiBs).

Consumed MiB

Total consumed capacity of the disk (in MiBs).

Free MiB

Free space on the disk (in MiBs). This is retrieved by VMware Tools.  
Is empty when the information from VMware tools is not available.

Free %

Percentage free space on the disk.  
Is empty when the information from VMware tools is not available.

Internal Sort Column

Internally used to sort the data.

Annotation

Description for the virtual machine.

Custom Fields

The custom fields which you have defined.

Datacenter

The name of the datacenter where the VM is running.

Cluster

The name of the cluster where the VM is running.

Host

The host that is responsible for running a virtual machine. This property is null when the virtual machine is not running and is not assigned to run on a particular host.

Folder

The name of the folder where the VM is placed. By default not visible because it's a performance killer. You can change the default behavior by changing the preferences.  
See menu, Edit, Preferences

OS according to the configuration file

This is the full name of the guest operating system for the virtual machine according to the configuration file.

OS according to the VMware Tools

This is the full name of the guest operating system for the virtual machine according to the VMware Tools.

VM ID

Object ID which can be used to find the VM when you browse the VI SDK.



### VM UUID

VirtualCenter-specific 128-bit UUID of a virtual machine, represented as a hexadecimal string. This identifier is used by VirtualCenter to uniquely identify all virtual machine instances, including those that may share the same SMBIOS UUID.

### Virtual machine tags

Since version vSphere 6.5, tag information can be read from the CIS Rest API. Tags are only visible in RVTools when logged on with userid/password.

### VI SDK Server

VI SDK Server which is used by RVTools to gather the information.

### VI SDK UUID

A globally unique identifier associated with this service instance.

## vNetwork

The “vNetwork” tab displays for each virtual machine: the name of the VM, powerstate, template, SRM Placeholder, NIC label, Adapter type, network name, switch name, connected value, starts connected value, Mac Address, Mac Address type, IPv4 Address, IPv6 Address, direct path IO, Internal sort column, annotations, custom fields, datacenter name, cluster name, ESX host name, VM folder name, operating system name according to the config file, operating system name according to the VMware tools, VM ID, VM UUID, virtual machine tags, VI SDK Server and VI SDK UUID.

VM	Powerstate	Template	SRM Placeholder	NIC	Adapter	Network	Switch	Connected	Starts Connected	Mac Address	Type	IPv4 Address	IPv6 Address
DEBIAN	poweredOff	False	False	Network adapter 1	PCNet32	VM Network	vSwitch0	False	True	00:50:56:8d:f7:85	assigned		
Debian_Template	poweredOff	True	False	Network adapter 1	PCNet32	VM Network		False	True	00:50:56:8d:af:2e	assigned		
MARS	poweredOff	False	False	Network adapter 1	PCNet32	VM Network		False	True	00:50:56:8d:13:04	assigned		
PLUTO	poweredOff	False	False	Network adapter 1	PCNet32	VM Network		False	True	00:50:56:8d:37:5f	assigned		
SATURNNUS	poweredOn	False	False	Network adapter 1	E1000e	VM Network		False	True	00:50:56:8d:84:b8	assigned	169.254.35.30	fe80:d885:4835:4
SATURNNUS	poweredOn	False	False	Network adapter 2	E1000e	VM Network		False	False	00:50:56:8d:93:c1	assigned	169.254.161.139	fe80:9057:608f:d
SATURNNUS	poweredOn	False	False	Network adapter 3	E1000e	VM Network		False	False	00:50:56:8d:29:eb	assigned	169.254.230.0	fe80:180f:567d:6
SATURNNUS	poweredOn	False	False	Network adapter 4	E1000e	VM Network		False	False	00:50:56:8d:70:50	assigned	169.254.10.67	fe80:84ba:1f1:a0
SATURNNUS	poweredOn	False	False	Network adapter 5	E1000e	VM Network		False	False	00:50:56:8d:ca:34	assigned	169.254.222.160	fe80:a12b:7738:0
SATURNNUS	poweredOn	False	False	Network adapter 6	E1000e	VM Network		False	False	00:50:56:8d:39:d2	assigned	169.254.154.218	fe80:2842:49ec:0
SATURNNUS	poweredOn	False	False	Network adapter 7	Vmxnet3	VM Network		False	False	00:50:56:8d:ba:ed	assigned	169.254.41.177	fe80:45ec:9e29:c

## VM

Display name of the virtual machine.

## Powerstate

This column lists the powerstate for a virtual machine: poweredOn, poweredOff, or suspended. This column does not model substates, such as when a task is running to change the virtual machine state. If the virtual machine is in a state with a task in progress, it transitions to a new state when the task completes. For example, a virtual machine continues to be in the poweredOn state while a suspend task is running, and changes to the suspended state once the task finishes.

NAME	DESCRIPTION
poweredOff	The virtual machine is currently powered off.
poweredOn	The virtual machine is currently powered on.
suspended	The virtual machine is currently suspended.

## Template

Column which specifies if this is a template or not.

## SRM Placeholder

Column which specifies if this is a SRM placeholder or not.

## NIC label

Label showing the order number of the NIC.

## Adapter

Name of the network adapter.

The following network adapters might be available for your virtual machine:

Source: <http://communities.vmware.com/thread/191081>

- Vlance — Vlance (also called PCNet32) is a faithful virtual implementation of a common, if now somewhat aging, physical network adapter. Most 32-bit guest operating systems, except for Windows Vista, have built-in support for this card so a virtual machine configured with this network adapter can use its network immediately.
- vmxnet — The vmxnet virtual network adapter has no physical counterpart. VMware makes vmxnet available because Vlance, a faithful implementation of a physical card, is far from optimal for network performance in a virtual machine. Vmxnet is highly optimized for performance in a virtual machine. Because there is no physical card of type vmxnet, operating system vendors do not provide built-in drivers for this card. You must install VMware Tools to have a driver for the vmxnet network adapter available.
- Flexible — The Flexible network adapter identifies itself as a Vlance adapter when a virtual machine boots, but initializes itself and functions as either a Vlance or a vmxnet adapter, depending which driver initializes it. VMware Tools versions recent enough to know about the Flexible network adapter include the vmxnet driver but identify it as an updated Vlance driver, so the guest operating system uses that driver. When using the Flexible network adapter, you can have vmxnet performance when sufficiently recent VMware tools are installed. When an older version of VMware Tools is installed, the Flexible adapter uses the Vlance adapter (with Vlance performance) rather than giving no network capability at all when it can't find the vmxnet adapter.
- e1000 — e1000 is a faithful virtual implementation of a physical network adapter that is broadly supported by newer operating systems, specifically most 64-bit operating systems and both 32- and 64-bit Windows Vista. e1000 performance is intermediate between Vlance and vmxnet.
- Enhanced vmxnet — The enhanced vmxnet adapter is based on the vmxnet adapter but provides some high-performance features commonly used on modern networks, such as jumbo frames. This virtual network adapter is the current state-of-the-art device in virtual network adapter performance, but it is available only for some guest operating systems on ESX Server 3.5. This network adapter will become available for additional guest operating systems in the future.

Enhanced VMXNET is supported only for a limited set of guest operating systems:

- 32/64-bit versions of Microsoft Windows 2003 (Enterprise and Datacenter Editions). You can use enhanced vmxnet adapters with other versions of the Microsoft Windows 2003 operating system, but a workaround is required to enable the option in the VI Client. See <http://kb.vmware.com/kb/1007195>.
- 32/64-bit versions Red Hat Enterprise Linux 5.0
- 32/64-bit versions SUSE Linux Enterprise Server 10
- 64-bit versions Red Hat Enterprise Linux 4.0

### Network

Name of the network connected to this adapter.

Switch

Name of the switch where the virtual network adaptor is connected to.

Connected

Column indicating if the virtual network adaptor is connected or not.

Starts Connected

Column indicating if the virtual network adaptor starts connected or not.

Mac Address

MAC address of the adapter.

Mac Type

This field can have one of the following values:

Manual	Statically assigned MAC address.
Generated	Automatically generated MAC address.
Assigned	MAC address assigned by VirtualCenter.

IPv4 Address

IPv4 addresses of the adapter.

IPv6 Address

IPv6 addresses of the adapter.

Direct Path IO

Indicates if UPT (Universal Pass-through) compatibility is enabled on this network adapter. UPT is only compatible for Vmxnet3 adapter. Clients can set this property enabled or disabled if ethernet virtual device is Vmxnet3.

Internal Sort Column

Internally used to sort the data.

Annotation

Description for the virtual machine.

Custom Fields

The custom fields which you have defined.

Datacenter

The name of the datacenter where the VM is running.

Cluster

The name of the cluster where the VM is running.

Host

The host that is responsible for running a virtual machine. This property is null when the virtual machine is not running and is not assigned to run on a particular host.

### Folder

The name of the folder where the VM is placed. By default not visible because it's a performance killer. You can change the default behavior by changing the preferences. See menu, Edit, Preferences

### OS according to the configuration file

This is the full name of the guest operating system for the virtual machine according to the configuration file.

### OS according to the VMware Tools

This is the full name of the guest operating system for the virtual machine according to the VMware Tools.

### VM ID

Object ID which can be used to find the VM when you browse the VI SDK.

### VM UUID

VirtualCenter-specific 128-bit UUID of a virtual machine, represented as a hexadecimal string. This identifier is used by VirtualCenter to uniquely identify all virtual machine instances, including those that may share the same SMBIOS UUID.

### Virtual machine tags

Since version vSphere 6.5, tag information can be read from the CIS Rest API. Tags are only visible in RVTools when logged on with userid/password.

### VI SDK Server

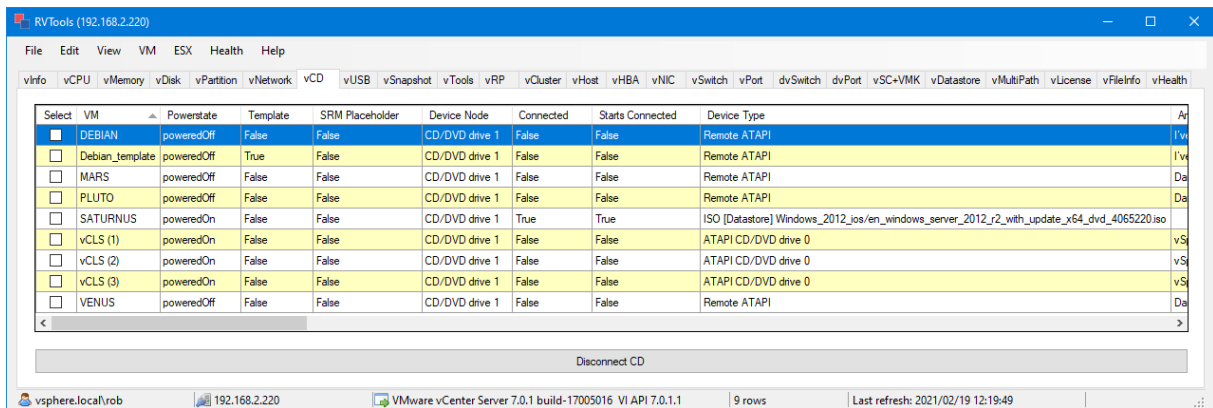
VI SDK Server which is used by RVTools to gather the information.

### VI SDK UUID

A globally unique identifier associated with this service instance.

## vCD

The “vCD” tab displays CD-Rom information for each virtual machine: name of the VM, powerstate, template, SRM Placeholder, device node, connected value, start connected value, device type, annotations, custom fields, datacentername, cluster name, ESX host name, VM folder name, operating system name according to the config file, operating system name according to the VMware tools, VM ID, VM UUID, virtual machine tags, VI SDK Server and VI SDK UUID. It’s possible to disconnect the CD-Rom from this screen.



## VM

Display name of the virtual machine.

## Powerstate

This column lists the powerstate for a virtual machine: poweredOn, poweredOff, or suspended. This column does not model substates, such as when a task is running to change the virtual machine state. If the virtual machine is in a state with a task in progress, it transitions to a new state when the task completes. For example, a virtual machine continues to be in the poweredOn state while a suspend task is running, and changes to the suspended state once the task finishes.

NAME	DESCRIPTION
poweredOff	The virtual machine is currently powered off.
poweredOn	The virtual machine is currently powered on.
suspended	The virtual machine is currently suspended.

## Template

Column which specifies if this is a template or not.

## SRM Placeholder

Column which specifies if this is a SRM placeholder or not.

## Device Node

This column provides a node for the device.

## Connected

Column indicating if the virtual device is connected or not. Only valid when the virtual machine is running.

Starts connected

Column indicating if the virtual device is connected when the virtual machine starts.

Device Type

This column shows the device type.

Remote ATAPI = client device

ATAPI /dev/cdrom = host device

Annotation

Description for the virtual machine.

Custom Fields

The custom fields which you have defined.

Datacenter

The name of the datacenter where the VM is running.

Cluster

The name of the cluster where the VM is running.

Host

The host that is responsible for running a virtual machine. This property is null when the virtual machine is not running and is not assigned to run on a particular host.

Folder

The name of the folder where the VM is placed. By default not visible because it's a performance killer. You can change the default behavior by changing the preferences. See menu, Edit, Preferences

OS according to the configuration file

This is the full name of the guest operating system for the virtual machine according to the configuration file.

OS according to the VMware Tools

This is the full name of the guest operating system for the virtual machine according to the VMware Tools.

VMRef

For internal use only.

VM ID

Object ID which can be used to find the VM when you browse the VI SDK.

VM UUID

VirtualCenter-specific 128-bit UUID of a virtual machine, represented as a hexadecimal string. This identifier is used by VirtualCenter to uniquely identify all virtual machine instances, including those that may share the same SMBIOS UUID.

Virtual machine tags

Since version vSphere 6.5, tag information can be read from the CIS Rest API. Tags are only visible in RVTools when logged on with userid/password.

VI SDK Server

VI SDK Server which is used by RVTools to gather the information.

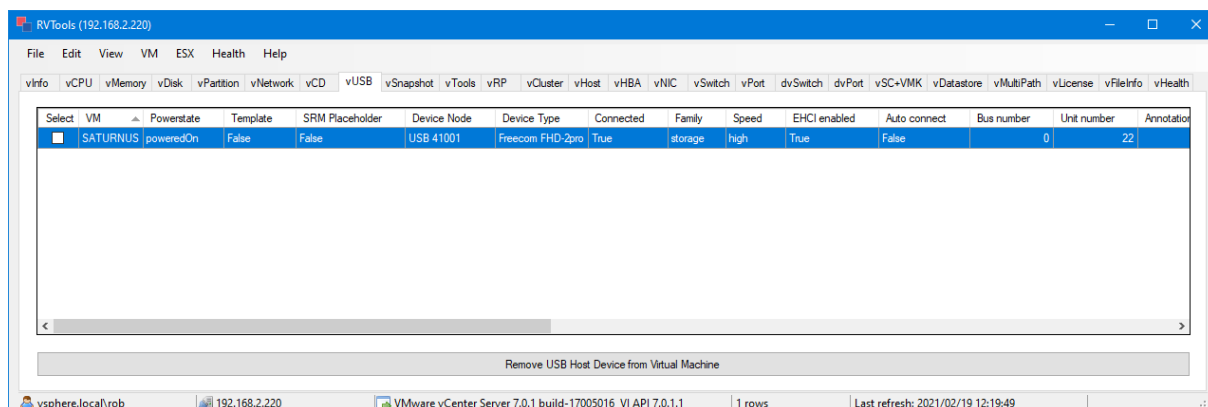
VI SDK UUID

A globally unique identifier associated with this service instance.



## vUSB

The “vUSB” tab displays for each virtual machine with a connected USB device: the name of the VM, Powerstate, Template, SRM Placeholder, Device node, Device type, Connected switch, Family, Speed, EHCI enabled value, Auto connect value, Bus number, Unit number, annotations, custom fields, datacenter name, cluster name, ESX host name, VM folder name, operating system name according to the config file, operating system name according to the VMware tools, VM ID, VM UUID, virtual machine tags, VI SDK Server and VI SDK UUID.



## VM

Display name of the virtual machine.

## Powerstate

This column lists the powerstate for a virtual machine: poweredOn, poweredOff, or suspended. This column does not model substates, such as when a task is running to change the virtual machine state. If the virtual machine is in a state with a task in progress, it transitions to a new state when the task completes. For example, a virtual machine continues to be in the poweredOn state while a suspend task is running, and changes to the suspended state once the task finishes.

NAME	DESCRIPTION
poweredOff	The virtual machine is currently powered off.
poweredOn	The virtual machine is currently powered on.
suspended	The virtual machine is currently suspended.

## Template

Column which specifies if this is a template or not.

## SRM Placeholder

Column which specifies if this is a SRM Placeholder or not.

## Device Node

Name of the device.

## Device type

This column shows the device type.

Connected

Column indicating if the virtual device is connected or not. Only valid when the virtual machine is running.

Family

Device class family.

Speed

Device speeds detected by server.

EHCI enabled

Indicates if enhanced host controller interface (USB 2.0) is enabled on this controller.

Auto connect

Indicates if the ability to hot plug devices is enabled on this controller.

Bus number

Bus number associated with this controller.

Unit number

The unit number of this device on its controller. This property is null if the controller property is null (for example, when the device is not attached to a specific controller object).

Annotation

Description for the virtual machine.

Custom Fields

The custom fields which you have defined.

Datacenter

The name of the datacenter where the VM is running.

Cluster

The name of the cluster where the VM is running.

Host

The host that is responsible for running a virtual machine. This property is null when the virtual machine is not running and is not assigned to run on a particular host.

Folder

The name of the folder where the VM is placed. By default not visible because it's a performance killer. You can change the default behavior by changing the preferences. See menu, Edit, Preferences

OS according to the configuration file

This is the full name of the guest operating system for the virtual machine according to the configuration file.

OS according to the VMware Tools

This is the full name of the guest operating system for the virtual machine according to the VMware Tools.

VMRef

For internal use only.

VM ID

Object ID which can be used to find the VM when you browse the VI SDK.

VM UUID

VirtualCenter-specific 128-bit UUID of a virtual machine, represented as a hexadecimal string. This identifier is used by VirtualCenter to uniquely identify all virtual machine instances, including those that may share the same SMBIOS UUID.

Virtual machine tags

Since version vSphere 6.5, tag information can be read from the CIS Rest API. Tags are only visible in RVTools when logged on with userid/password.

VI SDK Server

VI SDK Server which is used by RVTools to gather the information.

VI SDK UUID

A globally unique identifier associated with this service instance.

## vSnapshot

The "vSnapshot" tab displays for each snapshot: the VM name, powerstate, snapshot name, description, date / time of the snapshot, filename, size MiB (vmsn), size MiB total, quiesced value, state value, annotations, custom fields, datacenter name, cluster name, ESX host name, VM folder name, operating system name according to the config file, operating system name according to the VMware tools, VM ID, VM UUID, virtual machine tags, VI SDK Server and VI SDK UUID.

VM	Powerstate	Name	Description	Date / time	Filename	Size MB (vmsn)	Size MiB (total)	Quiesced	State	Annotat
PLUTO	poweredOff	VM Snapshot 19-12-2020 16:20:44		2020/12/19 16:20:52	[Datastore] PLUTOO/PLUTO-Snapshot1.vmsn	0.0186	0.0459	False	poweredOff	Damn St
PLUTO	poweredOff	VM Snapshot 17-1-2021 16:45:09	test snapshot #2	2021/01/17 16:45:19	[Datastore] PLUTOO/PLUTO-Snapshot2.vmsn	0.0186	0.0459	False	poweredOff	Damn St
SATURNUS	poweredOn	VM Snapshot 29-12-2020 16:07:00		2020/12/29 16:07:09	[vsanDatastore] SATURNUS/SATURNUS-Snapshot1.vmsn	1.2578	513.2578	False	poweredOn	

### VM

Display name of the virtual machine.

### Powerstate

This column lists the powerstate for a virtual machine: poweredOn, poweredOff, or suspended. This column does not model substates, such as when a task is running to change the virtual machine state. If the virtual machine is in a state with a task in progress, it transitions to a new state when the task completes. For example, a virtual machine continues to be in the poweredOn state while a suspend task is running, and changes to the suspended state once the task finishes.

NAME	DESCRIPTION
poweredOff	The virtual machine is currently powered off.
poweredOn	The virtual machine is currently powered on.
suspended	The virtual machine is currently suspended.

### Name

Name of the snapshot.

### Description

Description of the snapshot.

### Date / time

The date and time the snapshot was taken.

### Filename

Filename of snapshot.

Size MiB (vmsn)

Size of the memory state at the time the snapshot was taken.

Size MiB (total)

Total size of disk and memory images for this snapshot.

Quiesced

Indicates if the snapshot was created with the "quiesce" option, ensuring a consistent state of the file system.

State

The power state of the virtual machine when this snapshot was taken.

Annotation

Description for the virtual machine.

Custom Fields

The custom fields which you have defined.

Datacenter

The name of the datacenter where the VM is running.

Cluster

The name of the cluster where the VM is running.

Host

The host that is responsible for running a virtual machine. This property is null when the virtual machine is not running and is not assigned to run on a particular host.

Folder

The name of the folder where the VM is placed. By default not visible because it's a performance killer. You can change the default behavior by changing the preferences. See menu, Edit, Preferences

OS according to the configuration file

This is the full name of the guest operating system for the virtual machine according to the configuration file.

OS according to the VMware Tools

This is the full name of the guest operating system for the virtual machine according to the VMware Tools.

VM ID

Object ID which can be used to find the VM when you browse the VI SDK.

VM UUID

VirtualCenter-specific 128-bit UUID of a virtual machine, represented as a hexadecimal string. This identifier is used by VirtualCenter to uniquely identify all virtual machine instances, including those that may share the same SMBIOS UUID.

Virtual machine tags

Since version vSphere 6.5, tag information can be read from the CIS Rest API. Tags are only visible in RVTools when logged on with userid/password.

VI SDK Server

VI SDK Server which is used by RVTools to gather the information.

VI SDK UUID

A globally unique identifier associated with this service instance.

## vTools

The “vTools” tab displays for each virtual machine: the VM name, powerstate, template, SRM Placeholder, virtual machine hardware version, Tools status, tools version, required tools version, upgradeable flag, upgrade policy, sync time, app status, heartbeat status, kernel crash state, operation ready, state change support, interactive guest, annotations, custom fields, datacenter name, cluster name, ESX host name, VM folder name, operating system name according to the config file, operating system name according to the VMware tools, VM ID, VM UUID, virtual machine tags, VI SDK Server and VI SDK UUID.

*When you install a patched version of ESX Server, VMware expects you to upgrade VMware Tools to the latest version, included with that release. If you report a problem with a virtual machine that has an older version of the VMware Tools installed in the guest operating system, VMware Technical Support may ask you to upgrade the VMware tools to the version included with the ESX Server Patch in the process of troubleshooting that problem.*

Upgrade	VM	Powerstate	Template	SRM Placeholder	VM Version	Tools	Tools Version	Required Version	Upgradeable	Upgrade Policy	Sync time	App status	Heartbeat
<input checked="" type="checkbox"/>	DEBIAN	poweredOff	False	False	7	toolsNotInstalled	0	11.297	No	manual	False		
<input type="checkbox"/>	Debian_template	poweredOff	True	False				11.297	No	manual	False		
<input type="checkbox"/>	MARS	poweredOff	False	False	7	toolsNotInstalled	0	11.297	No	manual	False		
<input type="checkbox"/>	PLUTO	poweredOff	False	False	7	toolsNotInstalled	0	11.297	No	manual	False		
<input type="checkbox"/>	SATURNUS	poweredOn	False	False	18	toolsOk	11.297	11.297	Yes	manual	False	none	appStatusG
<input type="checkbox"/>	vCLS (1)	poweredOn	False	False	11	toolsOk	11.296	11.297	No	manual	False	none	appStatusG
<input type="checkbox"/>	vCLS (2)	poweredOn	False	False	11	toolsOk	11.296	11.297	No	manual	False	none	appStatusG
<input type="checkbox"/>	vCLS (3)	poweredOn	False	False	11	toolsOk	11.296	11.297	No	manual	False	none	appStatusG
<input type="checkbox"/>	VENUS	poweredOff	False	False	7	toolsNotInstalled	0	11.297	No	manual	False		

## VM

Display name of the virtual machine.

## Powerstate

This column lists the powerstate for a virtual machine: poweredOn, poweredOff, or suspended. This column does not model substates, such as when a task is running to change the virtual machine state. If the virtual machine is in a state with a task in progress, it transitions to a new state when the task completes. For example, a virtual machine continues to be in the poweredOn state while a suspend task is running, and changes to the suspended state once the task finishes.

NAME	DESCRIPTION
poweredOff	The virtual machine is currently powered off.
poweredOn	The virtual machine is currently powered on.
suspended	The virtual machine is currently suspended.

## Template

Column which specifies if this is a template or not.

SRM Placeholder

Column which specifies if this is a SRM placeholder or not.

VM Version

Virtual machine hardware version.

Tools

Current status of VMware Tools running in the guest operating system.

NAME	DESCRIPTION
toolsNotInstalled	VMware Tools has never been installed or has not run in the virtual machine.
toolsNotRunning	VMware Tools is not running.
toolsOk	VMware Tools is running and the version is current.
toolsOld	VMware Tools is running, but the version is not current.

Tools version

Current version of VMware Tools, if known.

```
# VMware version-mapping file.
#
# This file provides a one-to-one mapping between VMware Tools for
# ESX/ESXi version-number codes, and paths to OSP repositories suitable
# for that Tools version.
#
# The ESXi server mapping is only to show that the particular version of
# Tools ships with that particular ESXi server build number, but the Tools
# can work with a greater range of ESXi versions.
#
# Column 1: Tools version on NGC/VI Client
# Column 2: ESXi server version.'esx/0.0' indicates that the tools version
# is not yet bundled with ESXi.
# Column 3: ESXi server build number
# Column 4: Tools version on guest Setup/About page
# Column 5: Tools build number
#
12320      esx/7.0p06      20842708      12.1.0      20219665
12325      esx/0.0         20842708      12.1.5      20735119
12294      esx/8.0         20513097      12.0.6      20104755
12294      esx/6.7p08      20497097      12.0.6      20104755
12294      esx/6.5p09      20502893      12.0.6      20104755
12320      esx/0.0         20842708      12.1.0      20219665
10361      esx/0.0         10361         10.3.25     20206839
12294      esx/0.0         20842708      12.0.6      20104755
12288      esx/7.0p05      20036589      12.0.0      19345655
12288      esx/6.7p07      19898906      12.0.0      19345655
12293      esx/0.0         20842708      12.0.5      19716617
12288      esx/6.5p08      19588618      12.0.0      19345655
11365      esx/7.0p04      19482537      11.3.5      18557794
11365      esx/6.7p06      18828794      11.3.5      18557794
10360      esx/0.0         10360         10.3.24     18733423
11360      esx/6.5p07      18678235      11.3.0      18090558
11360      esx/7.0u3       18644231      11.3.0      18090558
11334      esx/7.0p03      18426014      11.2.6      17901274
11333      esx/7.0u2       17630552      11.2.5      17337674
11333      esx/6.7p05      17700523      11.2.5      17337674
```



11329	esx/6.5p06	17477841	11.2.1	17243207
10359	esx/6.5p06	17477841	10.3.23	17030940
11328	esx/0.0		11.2.0	16938113
11301	esx/7.0p02	17325551	11.1.5	16724464
11297	esx/7.0u1	16850804	11.1.1	16303738
11297	esx/6.7p04	17167734	11.1.1	16303738
11297	esx/6.7p03	16713306	11.1.1	16303738
11297	esx/6.5p05	16576891	11.1.1	16303738
11296	esx/7.0p01	16324942	11.1.0	16036546
10358	esx/0.0		10.3.22	15902021
11270	esx/0.0		11.0.6	15940789
11269	esx/6.7p02	16075168	11.0.5	15389592
11269	esx/7.0	15843807	11.0.5	15389592
11265	esx/6.5p04	15256549	11.0.1	14773994
10357	esx/6.7p01	15160138	10.3.21	14772444
11265	esx/6.7p01	15160138	11.0.1	14773994
11264	esx/0.0		11.0.0	14549434
10356	esx/0.0		10.3.20	14389227
10346	esx/6.0p08	14513180	10.3.10	12406962
10346	esx/6.7u3	14320388	10.3.10	12406962
10346	esx/6.5u3	13932383	10.3.10	12406962
10341	esx/6.7u2	13006603	10.3.5	10430147
10341	esx/6.5p03	10884925	10.3.5	10430147
10338	esx/6.7ep05	10764712	10.3.2	9925305
10338	esx/6.7u1	10302608	10.3.2	9925305
10309	esx/6.0ep19	10719132	10.2.5	8068406
10309	esx/6.0p07	9239799	10.2.5	8068406
10305	esx/6.5ep11	10719125	10.2.1	8267844
10305	esx/6.7ep2a	9214924	10.2.1	8267844
10305	esx/6.5u2	8294253	10.2.1	8267844
10304	esx/6.7	8169922	10.2.0	7253323
10287	esx/6.5p02	7388607	10.1.15	6677369
10282	esx/6.0p06	6921384	10.1.10	6082533
10279	esx/6.5u1	5969303	10.1.7	5541682
10277	esx/6.0p05	5572656	10.1.5	5055683
10272	esx/6.5p01	5146846	10.1.0	4449150
10272	esx/6.5	4564106	10.1.0	4449150
10252	esx/6.5	4564106	10.0.12	4448496
10249	esx/5.5p11	6480324	10.0.9	
10249	esx/5.5ep11	5230635	10.0.9	
10249	esx/6.0u3	5050593	10.0.9	
10249	esx/5.5p10	4722766	10.0.9	
10249	esx/6.0p04	4600944	10.0.9	
10249	esx/5.5p09	4345813	10.0.9	
10249	esx/6.0p03	4192238	10.0.9	
10249	esx/5.5p08	4179633	10.0.9	
10248	esx/0.0		10.0.8	
10246	esx/6.0u2	3620759	10.0.6	
10245	esx/0.0		10.0.5	
10240	esx/6.0ep05	3566359	10.0.0	
10240	esx/6.0p02	3380124	10.0.0	
10240	esx/5.5p07	3248547	10.0.0	
10240	esx/5.5ep10	3568722	10.0.0	
10240	esx/5.5ep09	3343343	10.0.0	
9541	esx/6.0ep04	3247720	9.10.5	
9541	esx/6.0u1	3029758	9.10.5	
9537	esx/6.0p01	2809209	9.10.1	
9536	esx/6.0	2494585	9.10.0	
9359	esx/5.5ep08	3116895	9.4.15	
9359	esx/5.5u3	3029944	9.4.15	
9356	esx/5.5p05	2668677	9.4.12	
9355	esx/5.5ep07	2638301	9.4.11	
9355	esx/5.5ep06	2456374	9.4.11	
9355	esx/5.5p04	2403361	9.4.11	
9354	esx/5.5ep05	2143827	9.4.10	
9354	esx/5.5p03	2143827	9.4.10	
9354	esx/5.5u2	2068190	9.4.10	

9350	esx/5.5p02	1892794	9.4.6
9349	esx/5.5ep04	1881737	9.4.5
9349	esx/5.5ep03	1746974	9.4.5
9349	esx/5.5ep02	1750340	9.4.5
9349	esx/5.5u1	1623387	9.4.5
9344	esx/5.5p01	1474528	9.4.0
9344	esx/5.5	1331820	9.4.0
9233	esx/5.1p09	3872664	9.0.17
9232	esx/5.1p08	3070626	9.0.16
9231	esx/5.1p07	2583090	9.0.15
9231	esx/5.1u3	2323236	9.0.15
9229	esx/5.1p06	2126665	9.0.13
9228	esx/5.1p05	1897911	9.0.12
9227	esx/5.1ep05	1900470	9.0.11
9227	esx/5.1p04	1743533	9.0.11
9226	esx/5.1ep04	1612806	9.0.10
9226	esx/5.1u2	1483097	9.0.10
9221	esx/5.1p03	1312873	9.0.5
9221	esx/5.1p02	1157734	9.0.5
9221	esx/5.1ep03	1117900	9.0.5
9221	esx/5.1u1	1065491	9.0.5
9217	esx/5.1ep02	1021289	9.0.1
9217	esx/5.1p01	914609	9.0.1
9216	esx/5.1	799733	9.0.0
8401	esx/5.0p13	3982828	8.6.17
8400	esx/5.0p12	3086167	8.6.16
8399	esx/5.0p11	2509828	8.6.15
8398	esx/5.0p10	2312428	8.6.14
8398	esx/5.0p09	1976090	8.6.14
8397	esx/5.0ep06	1918656	8.6.13
8397	esx/5.0p08	1851670	8.6.13
8396	esx/5.0p07	1489271	8.6.12
8395	esx/5.0u3	1311175	8.6.11
8395	esx/5.0p06	1254542	8.6.11
8395	esx/5.0ep05	1117897	8.6.11
8395	esx/5.0p05	1024429	8.6.11
8394	esx/5.0u2	914586	8.6.10
8397	esx/5.0p08	1739451	8.6.13
8389	esx/5.0p04	821926	8.6.5
8389	esx/5.0p03	768111	8.6.5
8389	esx/5.0u1	623860	8.6.5
8384	esx/5.0p02	515841	8.6.0
8384	esx/5.0p01	474610	8.6.0
8384	esx/5.0	469512	8.6.0
8307	esx/4.1p11		8.3.19
8307	esx/4.1p10		8.3.19
8307	esx/4.1p09		8.3.19
8307	esx/4.1p08		8.3.19
8306	esx/4.1p07		8.3.18
8305	esx/4.1p06		8.3.17
8305	esx/4.1u3		8.3.17
8300	esx/4.1p05		8.3.12
8300	esx/4.1p04		8.3.12
8300	esx/4.1u2		8.3.12
8295	esx/4.1p03		8.3.7
8295	esx/4.1u1		8.3.7
8290	esx/4.1		8.3.2
8199	esx/4.0p15		8.0.7
8199	esx/4.0p14		8.0.7
8198	esx/4.0p13		8.0.6
8197	esx/4.0ep09		8.0.5
8196	esx/4.0p12		8.0.4
8196	esx/4.0p11		8.0.4
8196	esx/4.0u4		8.0.4
8196	esx/4.0p10		8.0.4
8196	esx/4.0u3		8.0.4
8195	esx/4.0u2		8.0.3

8194	esx/4.0u1	8.0.2
8192	esx/4.0	8.0.0
7304	esx/3.5p27	7.4.8
7304	esx/3.5p25	7.4.8
7304	esx/3.5p24	7.4.8
7304	esx/3.5u5	7.4.8
7303	esx/3.5u4	7.4.7
7302	esx/3.5u3	7.4.6
7302	esx/3.5u2	7.4.6

Source: <http://packages.vmware.com/tools/versions>

Required tools version

Column which specifies if the tools are upgradeable from this application.

Upgradeable

Column which specifies if the tools are upgradeable from this application.

The UpgradeTools\_Task operation requires the following:

- ESX Server must be version 3.0.1 or later.
- The virtual machine must be powered on.
- VMware Tools must be installed and running.
- The VirtualMachine's guest.toolsStatus property must be either "toolsOK" or "toolsOld".
- VMware Tools must be the version that ships with ESX 3.0.

Upgrade Policy

The policy setting used to determine when tools are auto-upgraded for a virtual machine.

NAME	DESCRIPTION
manual	No auto-upgrades for tools will be performed for this virtual machine. Users must manually invoke the UpgradeTools operation to update the tools.
upgradeAtPowerCycle	When the virtual machine is power-cycled, the system checks for a newer version of tools when the VM comes back up. If it is available, a tools upgrade is automatically performed on the virtual machine and it is rebooted if necessary.

Sync Time

Indicates if the VMware tools program will sync time with the host time.

App status

Application state. If vSphere HA is enabled and the vm is configured for Application Monitoring and this field's value is "appStateNeedReset" then HA will attempt immediately reset the vm. There are some system conditions which may delay the immediate reset. The immediate reset will be performed as soon as allowed by vSphere HA and ESX. If during these conditions the value is changed to appStateOk the reset will be cancelled

NAME	DESCRIPTION
appStateNeedReset	Guest's application agent asks for immediate reset
appStateOk	The guest's application agent declared its state as normal and doesn't require any action
none	The application state wasn't set from the guest by the application agent. This is the default.

### Heartbeat status

Application heartbeat status.

NAME	DESCRIPTION
appStatusGray	Heartbeat status is disabled
appStatusGreen	Heartbeat status is OK
appStatusRed	Heartbeating has stopped

### Kernel Crash state

Guest operating system's kernel crash state. If true, the guest operating system's kernel has crashed.

### Operation ready

Guest Operations availability. If true, the virtual machine is ready to process guest operations.

### State change support

State change support. If true, the virtual machine is ready to process soft power operations.

### Interactive Guest

Interactive Guest Operations availability. If true, the virtual machine is ready to process guest operations as the user interacting with the guest desktop.

### Annotation

Description for the virtual machine.

### Custom Fields

The custom fields which you have defined.

### Datacenter

The name of the datacenter where the VM is running.

### Cluster

The name of the cluster where the VM is running.

### Host

The host that is responsible for running a virtual machine. This property is null when the virtual machine is not running and is not assigned to run on a particular host.

### Folder

The name of the folder where the VM is placed. By default not visible because it's a performance killer. You can change the default behavior by changing the preferences. See menu, Edit, Preferences

### OS according to the configuration file

This is the full name of the guest operating system for the virtual machine according to the configuration file.

### OS according to the VMware Tools

This is the full name of the guest operating system for the virtual machine according to the VMware Tools.

### VMRef

For internal use only.

### VM ID

Object ID which can be used to find the VM when you browse the VI SDK.

### VM UUID

VirtualCenter-specific 128-bit UUID of a virtual machine, represented as a hexadecimal string. This identifier is used by VirtualCenter to uniquely identify all virtual machine instances, including those that may share the same SMBIOS UUID.

### Virtual machine tags

Since version vSphere 6.5, tag information can be read from the CIS Rest API. Tags are only visible in RVTools when logged on with userid/password.

### VI SDK Server

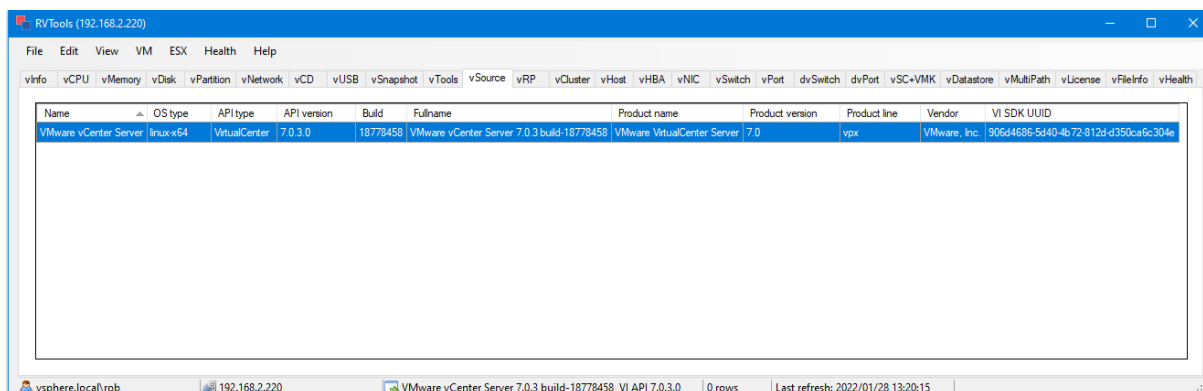
VI SDK Server which is used by RVTools to gather the information.

### VI SDK UUID

A globally unique identifier associated with this service instance.

## vSource

The "vSource" tab page displays information about the server where the SDK web services is running which is used by RVTools to gather all data. This is your vCenter server or ESX host. The following data is displayed: Name, OS type, API type, API version, Version, Patch level, Build, Fullname, Product name, Product version, Product line, Vendor, VI SDK Server and VI SDK UUID.



Name	OS type	API type	API version	Build	Fullname	Product name	Product version	Product line	Vendor	VI SDK UUID
VMware vCenter Server	linux-x64	VirtualCenter	7.0.3.0	18778458	VMware vCenter Server 7.0.3 build-18778458	VMware VirtualCenter Server	7.0	vpx	VMware, Inc	906d4686-5d40-4b72-912d-d350ca6c304e

### Name

Short form of the product name.

### OS type

Operating system type and architecture. Examples of values are:

- "win32-x86" - For x86-based Windows systems.
- "linux-x86" - For x86-based Linux systems.
- "vmnix-x86" - For the x86 ESX Server microkernel.
- "vmnix-arm64" - For the arm64 ESX Server microkernel.

### API type

Indicates if the service instance represents a standalone host or vCenter server.

- "VirtualCenter" - For a VirtualCenter instance.
- "HostAgent" - For host agent on an ESX Server or VMware Server host.

### API version

The version of the API as a dot-separated string

### Version

Dot-separated version string. For example, "1.2".

### Patch level

Patch level for the server.

### Build

Build string for the server on which this call is made.

Fullname

The complete product name, including the version information.

Product name

The license product name.

Product version

The license product version.

Product line

The product ID is a unique identifier for a product line. Examples of values are:

- "gsx" - For the VMware Server product.
- "esx" - For the ESX product.
- "embeddedEsx" - For the ESXi product.
- "esxio" - For the ESXio product.
- "vpx" - For the VirtualCenter product.

Vendor

Name of the vendor of this product.

VI SDK Server

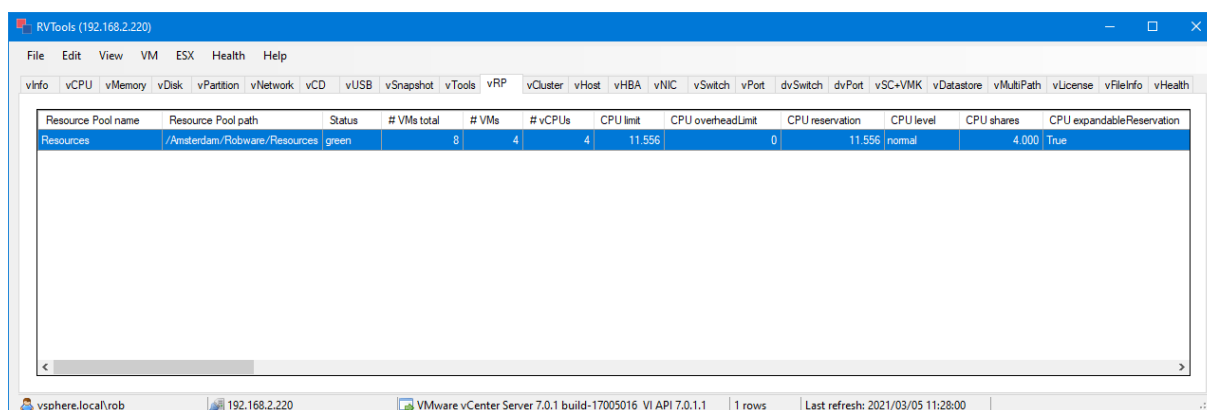
VI SDK Server which is used by RVTools to gather the information.

VI SDK UUID

A globally unique identifier associated with this service instance.

## vRP

The “vRP” tab displays for each resource pool: the name, path, status, Total number of VM’s, number of running VM’s, numbers of vCPUs, CPU limit, CPU overhead limit, CPU reservation, CPU Level, CPU shares, CPU expendable reservation switch, CPU max usage, CPU overall usage, CPU reservation used, CPU reservation used for VM, CPU unreserved for pool, CPU unreserved for VM, memory configured, memory limit, memory overhead limit, memory reservation, memory level, memory shares, memory expandable reservation, memory max usage, memory overall usage, memory reservation used, memory reservation used for vm, memory unreserved for pool, memory unreserved for vm, overall CPU demand statistics, Overall CPU usage statistics, static CPU Entitlement statistics, distributed CPU entitlement statistics, ballooned memory statistics, compressed memory statistics, consumed overhead memory statistics, distributed memory entitlement statistics, guest memory usage statistics, host memory usage statistics, overhead memory statistics, private memory statistics, shared memory statistics, static memory entitlement statistics, swapped memory statistics, object ID, resource pool tags, VI SDK Server and VI SDK UUID.



### Resource Pool name

Name of the resource pool

### Resource Pool path

Name and hierarchy of the resource pool.

### Status

NAME	DESCRIPTION
gray	The status is unknown.
green	The entity is OK.
red	The entity definitely has a problem.
yellow	The entity might have a problem.

**A General Discussion of Resource pool states and admission control** There are three states that the resource pool tree can be in: under committed (green), over committed (yellow), and inconsistent (red). Depending on the state, different resource pool configuration policies are enforced. The states are described in more detail below:

- **GREEN (aka under committed):** We have a tree that is in a *good* state. Every node has a reservation greater than the sum of the reservations for its children.



We have enough capacity at the root to satisfy all the resources reserved by the children. All operations performed on the tree, such as powering on virtual machines, creating new resource pools, or reconfiguring resource settings, will ensure that the above constraints are maintained.

- **RED (aka. inconsistent)**: One or more nodes in the tree has children whose reservations are greater than the node is configured to support. For example, i) a resource pool with a fixed reservation has a running virtual machine with a reservation that is higher than the reservation on resource pool itself., or ii) the child reservations are greater than the limit.

In this state, the DRS algorithm is disabled until the resource pool tree's configuration has been brought back into a consistent state. We also restrict the resources that such invalid nodes request from their parents to the configured reservation/limit, in an attempt to isolate the problem to a small subtree. For the rest of the tree, we determine if the cluster is under committed or overcommitted according to the existing rules and perform admission control accordingly.

Note that since all changes to the resource settings are validated on the VirtualCenter server, the system cannot be brought into this state by simply manipulating a cluster resource pool tree through VirtualCenter. It can only happen if a virtual machine gets powered on directly on a host that is part of a DRS cluster.

- **YELLOW (aka overcommitted)**: In this state, the tree is consistent internally, but the root resource pool does not have the capacity at to meet the reservation of its children. We can only go from GREEN -> YELLOW if we lose resources at the root. For example, host becomes unavailable or is put into maintenance mode. Note that we will always have enough capacity at the root to run all currently powered on VMs. However, we may not be able to satisfy all resource pool reservations in the tree. In this state, the reservation configured for a resource pool is no longer guaranteed, but the limits are still enforced. This provides additional flexibility for bringing the tree back into a consistent state, without risking bringing the tree into a RED state. In more detail:
  - **Resource Pool** The root is considered to have unlimited capacity. You can reserve resources without any check except the requirement that the tree remains consistent. This means that nodes whose parents are all configured with expandable reservations and no limit will have unlimited available resources. However, if there is an ancestor with a fixed reservation or an expandable reservation with a limit somewhere, then the node will be limited by the reservation/limit of the ancestor.
  - **Virtual Machine** Virtual machines are limited by ancestors with a fixed reservation and the capacity at the root.

#### # VMs total

Total number of VMs in this resource pool

#### # VMs

Number of running VMs in this resource pool

#### # vCPUs

Total number of virtual CPUs in this resource pool

### CPU limit

The utilization of a virtual machine/resource pool will not exceed this limit, even if there are available resources. This is typically used to ensure a consistent performance of virtual machines / resource pools independent of available resources. If set to -1, then there is no fixed limit on resource usage (only bounded by available resources and shares). Units are MHz.

### CPU overheadLimit

The maximum allowed overhead memory. For a powered on virtual machine, the overhead memory reservation cannot be larger than its overheadLimit. This property is only applicable to powered on virtual machines and is not persisted across reboots. This property is not applicable for resource pools. If set to -1, then there is no limit on reservation. Units are MiB.

### CPU reservation

Amount of resource that is guaranteed available to the virtual machine or resource pool. Reserved resources are not wasted if they are not used. If the utilization is less than the reservation, the resources can be utilized by other running virtual machines. Units are CPU.

### CPU level

The allocation level is a simplified view of shares. Levels map to a pre-determined set of numeric values for shares. If the shares value does not map to a predefined size, then the level is set as custom.

### CPU shares

The number of shares allocated. Used to determine resource allocation in case of resource contention. This value is only set if level is set to custom. If level is not set to custom, this value is ignored. Therefore, only shares with custom values can be compared. There is no unit for this value. It is a relative measure based on the settings for other resource pools.

### CPU expandableReservation

In a resource pool with an expandable reservation, the reservation on a resource pool can grow beyond the specified value, if the parent resource pool has unreserved resources. A non-expandable reservation is called a fixed reservation. This property is ignored for virtual machines.

### CPU maxUsage

Current upper-bound on usage. The upper-bound is based on the limit configured on this resource pool, as well as limits configured on any parent resource pool.

### CPU overallUsage

Close to real-time resource usage of all running child virtual machines, including virtual machines in child resource pools.

### CPU reservationUsed

Total amount of resources that have been used to satisfy the reservation requirements of all descendants of this resource pool (includes both resource pools and virtual machines).

#### CPU reservationUsedForVm

Total amount of resources that have been used to satisfy the reservation requirements of running virtual machines in this resource pool or any of its child resource pools.

#### CPU unreservedForPool

Total amount of resources available to satisfy a reservation for a child resource pool. In the under committed state, this is limited by the capacity at the root node. In the overcommitted case, this could be higher since we do not perform the dynamic capacity checks.

#### CPU unreservedForVm

Total amount of resources available to satisfy a reservation for a child virtual machine. In general, this should be the same as unreservedForPool. However, in the overcommitted case, this is limited by the remaining available resources at the root node.

#### Mem configured

Total configured memory of all virtual machines in the resource pool (in MiBs).

**Since** vSphere API 4.0

#### Mem limit

The utilization of a virtual machine/resource pool will not exceed this limit, even if there are available resources. This is typically used to ensure a consistent performance of virtual machines / resource pools independent of available resources. If set to -1, then there is no fixed limit on resource usage (only bounded by available resources and shares). Units are MiB.

#### Mem overheadLimit

The maximum allowed overhead memory. For a powered on virtual machine, the overhead memory reservation cannot be larger than its overheadLimit. This property is only applicable to powered on virtual machines and is not persisted across reboots. This property is not applicable for resource pools. If set to -1, then there is no limit on reservation. Units are MiB.

#### Mem reservation

Amount of resource that is guaranteed available to the virtual machine or resource pool. Reserved resources are not wasted if they are not used. If the utilization is less than the reservation, the resources can be utilized by other running virtual machines. Units are MiB.

#### Mem level

The allocation level is a simplified view of shares. Levels map to a pre-determined set of numeric values for shares. If the shares value does not map to a predefined size, then the level is set as custom.

#### Mem shares

The number of shares allocated. Used to determine resource allocation in case of resource contention. This value is only set if level is set to custom. If level is not set to custom, this value is ignored. Therefore, only shares with custom values can be

compared. There is no unit for this value. It is a relative measure based on the settings for other resource pools.

#### Mem expandableReservation

In a resource pool with an expandable reservation, the reservation on a resource pool can grow beyond the specified value, if the parent resource pool has unreserved resources. A non-expandable reservation is called a fixed reservation. This property is ignored for virtual machines.

#### Mem maxUsage

Current upper-bound on usage. The upper-bound is based on the limit configured on this resource pool, as well as limits configured on any parent resource pool.

#### Mem overallUsage

Close to real-time resource usage of all running child virtual machines, including virtual machines in child resource pools.

#### Mem reservationUsed

Total amount of resources that have been used to satisfy the reservation requirements of all descendants of this resource pool (includes both resource pools and virtual machines).

#### Mem reservationUsedForVm

Total amount of resources that have been used to satisfy the reservation requirements of running virtual machines in this resource pool or any of its child resource pools.

#### Mem unreservedForPool

Total amount of resources available to satisfy a reservation for a child resource pool. In the under committed state, this is limited by the capacity at the root node. In the overcommitted case, this could be higher since we do not perform the dynamic capacity checks.

#### Mem unreservedForVm

Total amount of resources available to satisfy a reservation for a child virtual machine. In general, this should be the same as unreservedForPool. However, in the overcommitted case, this is limited by the remaining available resources at the root node.

QS: A set of statistics that are typically updated with near real-time regularity. These statistics are aggregates of the corresponding statistics of all virtual machines in the given resource pool, and unless otherwise noted, only make sense when at least one virtual machine in the given resource pool is powered on.

#### QS overallCpuDemand

Basic CPU performance statistics, in MHz.

#### QS overallCpuUsage

Basic CPU performance statistics, in MHz.

#### QS staticCpuEntitlement

The static CPU resource entitlement for a virtual machine. This value is calculated based on this virtual machine's resource reservations, shares and limit, and doesn't take into account current usage. This is the worst-case CPU allocation for this virtual machine, that is, the amount of CPU resource this virtual machine would receive if all virtual machines running in the cluster went to maximum consumption. Units are MHz.

#### QS distributedCpuEntitlement

This is the amount of CPU resource, in MHz, that this VM is entitled to, as calculated by DRS. Valid only for a VM managed by DRS.

#### QS balloonedMemory

The size of the balloon driver in a virtual machine (in MiBs). The host will inflate the balloon driver to reclaim physical memory from a virtual machine. This is a sign that there is memory pressure on the host.

#### QS compressedMemory

The amount of compressed memory currently consumed by VM. **Since** vSphere API 4.1

#### QS consumedOverheadMemory

The amount of overhead memory (in MiBs) currently being consumed to run a VM. This value is limited by the overhead memory reservation for a VM, stored in overheadMemory.

#### QS distributedMemoryEntitlement

This is the amount of memory (in MiBs) that this VM is entitled to, as calculated by DRS. Valid only for a VM managed by DRS.

#### QS guestMemoryUsage

Guest memory utilization statistics (in MiBs). This is also known as active guest memory. The number can be between 0 and the configured memory size of a virtual machine.

#### QS hostMemoryUsage

Host memory utilization statistics (in MiBs). This is also known as consumed host memory. This is between 0 and the configured resource limit. Valid while a virtual machine is running. This includes the overhead memory of a virtual machine.

#### QS overheadMemory

The amount of memory resource (in MiBs) that will be used by a virtual machine above its guest memory requirements. This value is set if and only if a virtual machine is registered on a host that supports memory resource allocation features. For powered off VMs, this is the minimum overhead required to power on the VM on the registered host. For powered on VMs, this is the current overhead reservation, a value which is almost always larger than the minimum overhead, and which grows with time.

#### QS privateMemory

The portion of memory (in MiBs) that is granted to a virtual machine from non-shared host memory.

#### QS sharedMemory

The portion of memory (in MiBs) that is granted to a virtual machine from host memory shared between VMs.

#### QS staticMemoryEntitlement

The static memory resource entitlement for a virtual machine. This value is calculated based on this virtual machine's resource reservations, shares and limit, and doesn't take into account current usage. This is the worst-case memory allocation for this virtual machine, that is, the amount of memory this virtual machine would receive if all virtual machines running in the cluster went to maximum consumption. Units are MiB.

#### QS swappedMemory

The portion of memory (in MiBs) that is granted to a virtual machine from the host's swap space. This is a sign that there is memory pressure on the host.

#### Object ID

VirtualCenter-specific 128-bit UUID of a resource pool, represented as a hexadecimal string.

#### Resource pool tags

Since version vSphere 6.5, tag information can be read from the CIS Rest API. Tags are only visible in RVTools when logged on with userid/password.

#### VI SDK Server

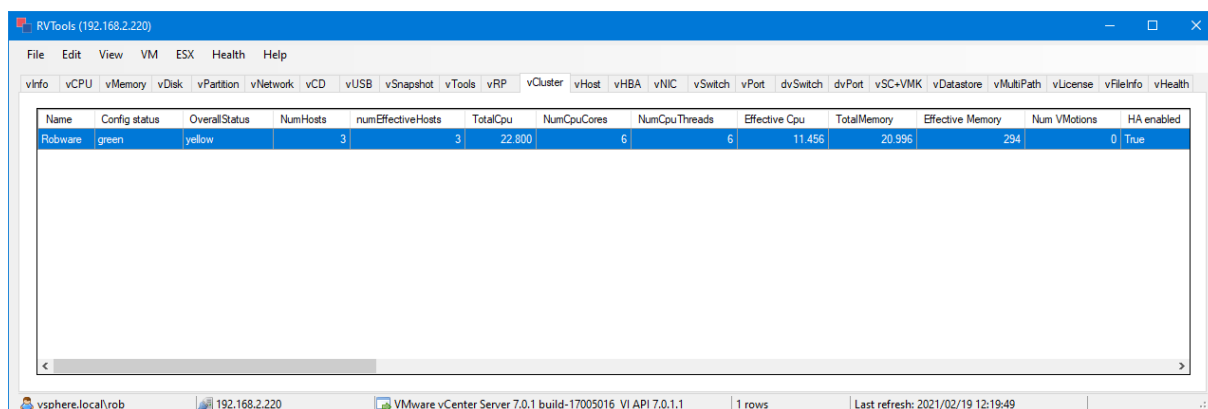
VI SDK Server which is used by RVTools to gather the information.

#### VI SDK UUID

A globally unique identifier associated with this service instance.

## vCluster

The "vCluster" tab displays for each cluster: the name, config status, overall status, number of hosts, number of effective hosts, Total cpu resources, number of cores, number of cpu threads, effective cpu resources, total memory, effective memory, number of vMotions, HA enabled flag, failover level, Admission control enabled flag, host monitoring flag, heart beat datastore candidate policy, Isolation response, restart priority, cluster settings, max failures, max failure window, failure interval, minimal up time, VM monitoring, DRS enabled flag, DRS default VM behavior, DRS vmotion rate, DPM enabled flag, DPM default behavior, DPM host power action rate, object ID, custom attributes, tags, VI SDK Server and VI SDK UUID.



### Name

Cluster name.

### Config status

The config status indicates if the system has detected a configuration issue involving this Cluster. The meanings of the config status values are:

- red: A problem has been detected involving the entity.
- yellow: A problem is about to occur, or a transient condition has occurred (For example, reconfigure fail-over policy).
- green: No configuration issues have been detected.
- gray: The configuration status of the entity is not being monitored.

A green status indicates only that a problem has not been detected; it is not a guarantee that the entity is problem-free. Config issues are displayed on the vHealth tab page.

### OverallStatus

Overall alarm status.

NAME	DESCRIPTION
gray	The status is unknown.
green	The entity is OK.
red	The entity definitely has a problem.
yellow	The entity might have a problem.

NumHosts

Total number of hosts.

NumEffectiveHosts

Total number of effective hosts.

TotalCpu

Aggregated CPU resources of all hosts, in MHz.

NumCpuCores

Number of physical CPU cores. Physical CPU cores are the processors contained by a CPU package.

NumCpuThreads

Aggregated number of CPU threads.

Effective Cpu

Effective CPU resources (in MHz) available to run virtual machines. This is the aggregated effective resource level from all running hosts. Hosts that are in maintenance mode or are unresponsive are not counted. Resources used by the VMware Service Console are not included in the aggregate. This value represents the amount of resources available for the root resource pool for running virtual machines.

TotalMemory

Aggregated memory resources of all hosts (in MiBs).

Effective Memory

Effective memory resources (in MiBs) available to run virtual machines. This is the aggregated effective resource level from all running hosts. Hosts that are in maintenance mode or are unresponsive are not counted. Resources used by the VMware Service Console are not included in the aggregate. This value represents the amount of resources available for the root resource pool for running virtual machines.

Num VMotions

Total number of migrations with VMotion that have been done internal to this cluster.

HA Enabled

Indicates if vSphere HA feature is enabled.

Failover Level

Configured failover level. This is the number of physical host failures that can be tolerated without impacting the ability to satisfy the minimums for all running virtual machines. Acceptable values range from one to four.

AdmissionControlEnabled

Indicates if strict admission control is enabled. When you use admission control, the following operations are prevented, if doing so would violate the admissionControlPolicy.

- Powering on a virtual machine in the cluster.
- Migrating a virtual machine into the cluster.



- Increasing the CPU or memory reservation of powered-on virtual machines in the cluster.

With admission control disabled, there is no assurance that all virtual machines in the HA cluster can be restarted after a host failure. VMware recommends that you do not disable admission control, but you might need to do so temporarily, for the following reasons:

- If you need to violate the failover constraints when there are not enough resources to support them (for example, if you are placing hosts in standby mode to test them for use with DPM).
- If an automated process needs to take actions that might temporarily violate the failover constraints (for example, as part of an upgrade directed by VMware Update Manager).
- If you need to perform testing or maintenance operations.

### Host monitoring

Determines if HA restarts virtual machines after a host fails.

### HB Datastore Candidate Policy

The policy on what datastores will be used by vCenter Server to choose heartbeat datastores. **Since** vSphere API 5.0

### Isolation Response

Indicates if the virtual machine should be powered off if a host determines that it is isolated from the rest of the compute resource. If not specified at either the cluster level or the virtual machine level, this will default to powerOff.

NAME	DESCRIPTION
clusterIsolationResponse	Use the default isolation response defined for the cluster that contains this virtual machine.
none	Do not power off the virtual machine in the event of a host network isolation.
powerOff	Power off the virtual machine in the event of a host network isolation.
shutdown	Shut down the virtual machine guest operating system in the event of a host network isolation. If the guest operating system fails to shutdown within five minutes, HA will initiate a forced power off.  When you use the shutdown isolation response, failover can take longer (compared to the powerOff response) because the virtual machine cannot fail over until it is shutdown.

### Restart Priority

Restart priority for a virtual machine. If not specified at either the cluster level or the virtual machine level, this will default to medium.

### Cluster Settings

Flag indicating whether to use the cluster settings or the per VM settings.

### Max Failures

Maximum number of failures and automated resets allowed during the time that maxFailureWindow specifies. If maxFailureWindow is -1 (no window), this represents the absolute number of failures after which automated response is stopped. If a virtual machine exceeds this threshold, in-depth problem analysis is usually needed. The default value is 3.

### Max Failure Window

The number of seconds for the window during which up to maxFailures resets can occur before automated responses stop. If set to -1, no failure window is specified. The default value is -1.

### Failure Interval

If no heartbeat has been received for at least the specified number of seconds, the virtual machine is declared as failed. The default value is 30.

### Min Up Time

The number of seconds for the virtual machine's heartbeats to stabilize after the virtual machine has been powered on. This time should include the guest operating system boot-up time. The virtual machine monitoring will begin only after this period. The default value is 120.

### VM Monitoring

Indicates the type of virtual machine monitoring. Specify a string value corresponding to one of the following values:

- vmMonitoringDisabled (the default value)
- vmMonitoringOnly
- vmAndAppMonitoring

### DRS enabled

Indicates if VirtualCenter is allowed to perform any DRS migration or initial placement recommendations for this virtual machine. If this flag is false, the virtual machine is effectively excluded from DRS. If no individual DRS specification exists for a virtual machine, this property defaults to true.

### DRS default VM behavior

Specifies the cluster-wide default DRS behavior for virtual machines.

### DRS vmotion rate

Threshold for generated ClusterRecommendations. DRS generates only those recommendations that are above the specified vmotionRate. Ratings vary from 1 to 5. This setting applies to manual, partiallyAutomated, and fullyAutomated DRS clusters.

### DPM enabled

Indicates if the service is enabled. This service can not be enabled unless DRS is enabled as well.

### DPM default behavior

Specifies the default VMware DPM behavior for hosts.

DPM Host Power Action Rate

DPM generates only those recommendations that are above the specified rating. Ratings vary from 1 to 5. This setting applies to both manual and automated DPM clusters.

Object ID

VirtualCenter-specific 128-bit UUID of cluster, represented as a hexadecimal string.

Custom attributes

The custom attributes.

Cluster tags

Since version vSphere 6.5, tag information can be read from the CIS Rest API.

Tags are only visible in RVTools when logged on with userid/password.

VI SDK Server

VI SDK Server which is used by RVTools to gather the information.

VI SDK UUID

A globally unique identifier associated with this service instance.

## vHost

The "vHost" tab displays for each host: the host name, datacenter name, cluster name, config status, compliance check state, maintenance mode value, Quarantine Mode value, vSAN Fault Domain name, CPU model, CPU speed, hyperthread information, number of CPU's, cores per CPU, number of cores, CPU usage %, total amount of memory, memory tiering type, memory usage %, memory reserved for the service console, number of NIC's, number of HBA's, total number of VM's on this host, number of VM's running on this host, number of VMs per core on this host, number of virtual CPU's, number of virtual CPU's per core, vRam, used memory by VM's, swapped memory by VM's, ballooned memory by VM's, vMotion support flag, storage vMotion support flag, current EVC mode, Max EVC mode, Assigned license, ATS heartbeat, ATS locking, Current CPU power man policy, Supported CPU power man, Host Power Policy, ESX version of this host, Boot time, custom fields, DNS Servers, DHCP, Domain name, Domain List, DNS Search Order, NTP Server(s), NTPD running, Time Zone, Time Zone Name, GMT Offset, hardware vendor, model, serial number, Service tag (serial #), OEM specific string, BIOS vendor, BIOS version, BIOS date, certificate issuer, certificate start date, certificate expiry date, certificate status, certificate subject, Host object id, host tags, UUID, VI SDK Server and VI SDK UUID.

Host	Datacenter	Cluster	Config status	in Maintenance Mode	in Quarantine Mode	vSAN Fault Domain Name	CPU Model	Speed	HT Available	HT Active
esxa.vsphere.local	Amsterdam	Robware	yellow	False	False	Rack 2	AMD Ryzen 9 3900XT 12-Core Processor	3,800	False	False
esxb.vsphere.local	Amsterdam	Robware	yellow	False	False	Rack 1	AMD Ryzen 9 3900XT 12-Core Processor	3,800	False	False
esxc.vsphere.local	Amsterdam	Robware	yellow	False	False	Rack 3	AMD Ryzen 9 3900XT 12-Core Processor	3,800	False	False

### Host

Name of the ESX host.

### Datacenter

Name of the datacenter.

### Cluster

Name of the cluster.

### Config status

The config status indicates if the system has detected a configuration issue involving this Host. The meanings of the config status values are:

- red: A problem has been detected involving the entity.
- yellow: A problem is about to occur, or a transient condition has occurred (For example, reconfigure fail-over policy).
- green: No configuration issues have been detected.
- gray: The configuration status of the entity is not being monitored.

A green status indicates only that a problem has not been detected; it is not a guarantee that the entity is problem-free. Config issues are displayed on the vHealth tab page.

#### Compliance Check State

The host profile compliance check state. **Since** vSphere API 6.7

NAME	DESCRIPTION
compliant	Entity is in Compliance
nonCompliant	Entity is out of Compliance
running	Compliance check on this host is running. <b>Since</b> vSphere API 6.7
unknown	Compliance status of the entity is not known

#### Maintenance mode

Indicates if the host is in maintenance mode. This flag is set when the host has entered the maintenance mode. It is not set during the entering phase of maintenance mode.

#### Quarantine Mode

Indicates if the host is in quarantine mode.

#### Quarantine Mode

vSAN host fault domain name.

#### CPU Model

The CPU model.

#### Speed

The speed of the CPU cores. This is an average value if there are multiple speeds. The product of cpuMhz and numCpuCores is approximately equal to the sum of the MHz for all the individual cores on the host.

#### HT Available

Indicates if hyperthreading optimization is available on the system. This property is set by VMware prior to installation.

#### HT Active

Indicates if the CPU scheduler is currently treating hyperthreads as schedulable resources. Setting this property involves a successful invocation of either the enableHyperThreading() method ("true") or the disableHyperthreading() method ("false"). The property is set once the system is rebooted.

#### # CPUs

Number of physical CPU cores on the host. Physical CPU cores are the processors contained by a CPU package.

#### Cores per CPU

Number of cores per physical CPU cores on the host.

### # Cores

Number of cores.

### CPU usage %

Aggregated CPU usage across all cores on the host in %.

### # Memory

Total amount of physical memory on the host (in MiBs).

### Memory Tiering Type

Type of memory tiering configured on this host. **Since** vSphere API 7.0.3.0

NAME	DESCRIPTION
hardwareTiering	The memory configuration where a tier is hardware-controlled and invisible to applications, e.g. Intel's Memory Mode.
noTiering	The traditional memory configuration without any tiers.

### Memory usage %

Physical memory usage on the host in %.

### Console

The amount of memory that is currently reserved for the service console.

### # NICs

The number of network adapters.

### # HBAs

The number of host bus adapters (HBAs).

### # VMs total

Total number of VMs on this host.

### # VMs

The number of running VMs on this host.

### VMs per core

The number of running VM's per core on this host.

### # vCPUs

Total number of running virtual CPUs on this host

### vCPUs per core

The number of active virtual cpu's per core.

### vRAM

Total amount of virtual RAM allocated to all running VMs.

VM Used memory

Guest memory: Total amount of memory (in MiBs) recently accessed.

VM Memory swapped

Guest memory: Total amount of memory (in MiBs) reclaimed by swapping.

VM Memory ballooned

Guest memory: Total amount of memory (in MiBs) reclaimed by ballooning.

VMotion support

Indicates if you can perform VMotion.

Storage VMotion support

Indicates if the storage of a powered-on virtual machine may be relocated.

Current EVC

The Enhanced VMotion Compatibility mode that is currently in effect for this host. If the host is in a cluster where EVC is active, this will match the cluster's EVC mode; otherwise this will be unset.

Max EVC

The most capable Enhanced VMotion Compatibility mode supported by the host hardware and software; unset if this host cannot participate in any EVC mode.

Assigned license

Assigned license.

ATS heartbeat

ATS heartbeat value.

ATS locking

ATS locking value.

Current CPU power man policy

Information about current CPU power management policy.

Supported CPU power man

Information about supported CPU power management.

Host Power Policy

Power Policy Short Name.

ESX Version

complete product name, including the version information.

Boot time

The time when the host was booted.

### DNS Servers

The IP addresses of the DNS servers, placed in order of preference.

*Note: When DHCP is not enabled, the property can be set explicitly. When DHCP is enabled, the property reflects the current DNS configuration, but cannot be set.*

### DHCP

Indicates if DHCP (dynamic host control protocol) is used to determine DNS configuration automatically.

### Domain

The domain name portion of the DNS name. For example, "vmware.com".

*Note: When DHCP is not enabled, the property can be set explicitly. When DHCP is enabled, the property reflects the current DNS configuration, but cannot be set.*

### Domain List

List of Windows domains available for user searches. **Since** vSphere API 6.0

### DNS Search domains

The domain in which to search for hosts, placed in order of preference.

*Note: When DHCP is not enabled, the property can be set explicitly. When DHCP is enabled, the property reflects the current DNS configuration, but cannot be set.*

### NTP Server(s)

List of time servers, specified as either IP addresses or fully qualified domain names (FQDNs). NTP issues are visible in the vHealth tab page.

### Time Zone

Description of the time zone.

### NTPD running

Indicates if the NTPD service is currently running.  
NTP issues are visible in the vHealth tab page.

### Time Zone Name

The time zone name.

### GMT Offset

The GMT offset in seconds that is currently applicable to the time zone (with respect to the current time on the host).

### Vendor

Name of hardware vendor.

### Model

System model identification.



Serial number

Serial number.

Service tag

The Service tag of the system.

OEM specific string

The Asset tag of the system

BIOS vendor

The vendor for the BIOS.

BIOS version

Current BIOS.version of physical machine.

BIOS date

Release date of BIOS.

Certificate Issuer

The issuer of the certificate.

Certificate Start Date

The start date for the certificate.

Certificate Expiry Date

The expiration date for the certificate.

Certificate Status

The status of a given certificate based on the hard and soft thresholds in vCenter Server.

NAME	DESCRIPTION
expirationImminent	The certificate expiration is imminent. (hard threshold)
expired	The certificate has expired.
expiring	The certificate is expiring shortly. (soft threshold - 1)
expiringShortly	The certificate is expiring shortly. (soft threshold - 2)
good	The certificate is good.
unknown	The certificate status is unknown.

Certificate Subject

The subject of the certificate.

Host tags

Since version vSphere 6.5, tag information can be read from the CIS Rest API.

Tags are only visible in RVTools when logged on with userid/password.

UUID

Hardware BIOS identification.

VI SDK Server

VI SDK Server which is used by RVTools to gather the information.

VI SDK UUID

A globally unique identifier associated with this service instance.

## vHBA

The vHBA tab displays for each host name: datacenter, cluster name, device name, device type, status flag, bus number, PCI address, driver name, driver model name, worldwide name, VI SDK Server and VI SDK UUID.

Host	Datacenter	Cluster	Device	Type	Status	Bus	Pci	Driver	Model	WWN	VI SDK Server	VI SDK UUID
esxa.vsphere.local	Amsterdam	Robware	vmhba64	Block SCSI	unknown	0	0000:00:07:1	vmkata	PIIX4 for 430TX/440BX/MX IDE Controller	192.168.2.220	192.168.2.220	906d4686-5d40-4b-72-812d-d350ca6c304e
esxa.vsphere.local	Amsterdam	Robware	vmhba2		unknown	20	0000:14:00:0	nvme_pcie	<class> Non-Volatile memory controller	192.168.2.220	192.168.2.220	906d4686-5d40-4b-72-812d-d350ca6c304e
esxa.vsphere.local	Amsterdam	Robware	vmhba1	Block SCSI	unknown	0	0000:00:07:1	vmkata	PIIX4 for 430TX/440BX/MX IDE Controller	192.168.2.220	192.168.2.220	906d4686-5d40-4b-72-812d-d350ca6c304e
esxb.vsphere.local	Amsterdam	Robware	vmhba1	Block SCSI	unknown	0	0000:00:07:1	vmkata	PIIX4 for 430TX/440BX/MX IDE Controller	192.168.2.220	192.168.2.220	906d4686-5d40-4b-72-812d-d350ca6c304e
esxb.vsphere.local	Amsterdam	Robware	vmhba2		unknown	20	0000:14:00:0	nvme_pcie	<class> Non-Volatile memory controller	192.168.2.220	192.168.2.220	906d4686-5d40-4b-72-812d-d350ca6c304e
esxb.vsphere.local	Amsterdam	Robware	vmhba64	Block SCSI	unknown	0	0000:00:07:1	vmkata	PIIX4 for 430TX/440BX/MX IDE Controller	192.168.2.220	192.168.2.220	906d4686-5d40-4b-72-812d-d350ca6c304e
esxb.vsphere.local	Amsterdam	Robware	vmhba0	SCSI	unknown	3	0000:03:00:0	pvscsi	PVSCSI SCSI Controller	192.168.2.220	192.168.2.220	906d4686-5d40-4b-72-812d-d350ca6c304e
esxc.vsphere.local	Amsterdam	Robware	vmhba2		unknown	20	0000:14:00:0	nvme_pcie	<class> Non-Volatile memory controller	192.168.2.220	192.168.2.220	906d4686-5d40-4b-72-812d-d350ca6c304e
esxc.vsphere.local	Amsterdam	Robware	vmhba64	Block SCSI	unknown	0	0000:00:07:1	vmkata	PIIX4 for 430TX/440BX/MX IDE Controller	192.168.2.220	192.168.2.220	906d4686-5d40-4b-72-812d-d350ca6c304e
esxc.vsphere.local	Amsterdam	Robware	vmhba0	SCSI	unknown	3	0000:03:00:0	pvscsi	PVSCSI SCSI Controller	192.168.2.220	192.168.2.220	906d4686-5d40-4b-72-812d-d350ca6c304e

### Host

Name of the ESX host.

### Datacenter

Name of the datacenter.

### Cluster

Name of the cluster.

### Device

The device name of host bus adapter.

### Type

HBA type.

### Status

The operational status of the adapter. Valid values include "online", "offline", and "fault".

### Bus

The host bus number.

### Pci

The Peripheral Connect Interface (PCI) ID of the device representing the host bus adapter.

### Driver

The name of the driver.

### Model

The model name of the host bus adapter.

WWN

The worldwide port name for the adapter.

VI SDK Server

VI SDK Server which is used by RVTools to gather the information.

VI SDK UUID

A globally unique identifier associated with this service instance.

## vNic

The vNic tab displays for each physical network card (on the host): host name, datacenter name, cluster name, network device, driver, speed, duplex switch, MAC address, virtual switch name, Uplink port, PCI ID, wake on switch, VI SDK Server and VI SDK UUID.

Host	Datacenter	Cluster	Network Device	Driver	Speed	Duplex	MAC	Switch	Uplink port	PCI	WakeOn	VI SDK Server	VI SDK UUID
esxa.vsphere.local	Amsterdam	Robware	vmnic4	nvmmxnet3	10.000	True	00:0c:29f9:79:75			0000:0c:00:0	False	192.168.2.220	906d4686-5d40-4b72-812d-d350c
esxa.vsphere.local	Amsterdam	Robware	vmnic0	nvmmxnet3	10.000	True	00:0c:29f9:79:4d	vSwitch0		0000:0b:00:0	False	192.168.2.220	906d4686-5d40-4b72-812d-d350c
esxa.vsphere.local	Amsterdam	Robware	vmnic3	nvmmxnet3	10.000	True	00:0c:29f9:79:6b			0000:04:00:0	False	192.168.2.220	906d4686-5d40-4b72-812d-d350c
esxa.vsphere.local	Amsterdam	Robware	vmnic2	nvmmxnet3	10.000	True	00:0c:29f9:79:61			0000:1b:00:0	False	192.168.2.220	906d4686-5d40-4b72-812d-d350c
esxa.vsphere.local	Amsterdam	Robware	vmnic1	nvmmxnet3	10.000	True	00:0c:29f9:79:57	DSwitch 1	uplink1	0000:13:00:0	False	192.168.2.220	906d4686-5d40-4b72-812d-d350c
esxb.vsphere.local	Amsterdam	Robware	vmnic3	nvmmxnet3	10.000	True	00:0c:29:04:b3:24			0000:04:00:0	False	192.168.2.220	906d4686-5d40-4b72-812d-d350c
esxb.vsphere.local	Amsterdam	Robware	vmnic1	nvmmxnet3	10.000	True	00:0c:29:04:b3:10	DSwitch 1	uplink1	0000:13:00:0	False	192.168.2.220	906d4686-5d40-4b72-812d-d350c
esxb.vsphere.local	Amsterdam	Robware	vmnic2	nvmmxnet3	10.000	True	00:0c:29:04:b3:1a			0000:1b:00:0	False	192.168.2.220	906d4686-5d40-4b72-812d-d350c
esxb.vsphere.local	Amsterdam	Robware	vmnic4	nvmmxnet3	10.000	True	00:0c:29:04:b3:2e			0000:0c:00:0	False	192.168.2.220	906d4686-5d40-4b72-812d-d350c
esxb.vsphere.local	Amsterdam	Robware	vmnic0	nvmmxnet3	10.000	True	00:0c:29:04:b3:06	vSwitch0		0000:0b:00:0	False	192.168.2.220	906d4686-5d40-4b72-812d-d350c
esxc.vsphere.local	Amsterdam	Robware	vmnic3	nvmmxnet3	10.000	True	00:0c:29:38:04:6b			0000:04:00:0	False	192.168.2.220	906d4686-5d40-4b72-812d-d350c

### Host

Name of the ESX host.

### Datacenter

Name of the datacenter.

### Cluster

Name of the cluster.

### Network device

The device name of the physical network adapter.

### Driver

The name of the driver.

### Speed

The bit rate on the link.

### Duplex

Indicates if the link is capable of full-duplex ("true") or only half-duplex ("false").

### PCI

Device hash of the PCI device corresponding to this physical network adapter.

### Switch

Name of (distributed) virtual switch to which the nic is connected.

### Uplink port

Name of uplink port.

Wake on

Indicates if the NIC is wake-on-LAN capable.

VI SDK Server

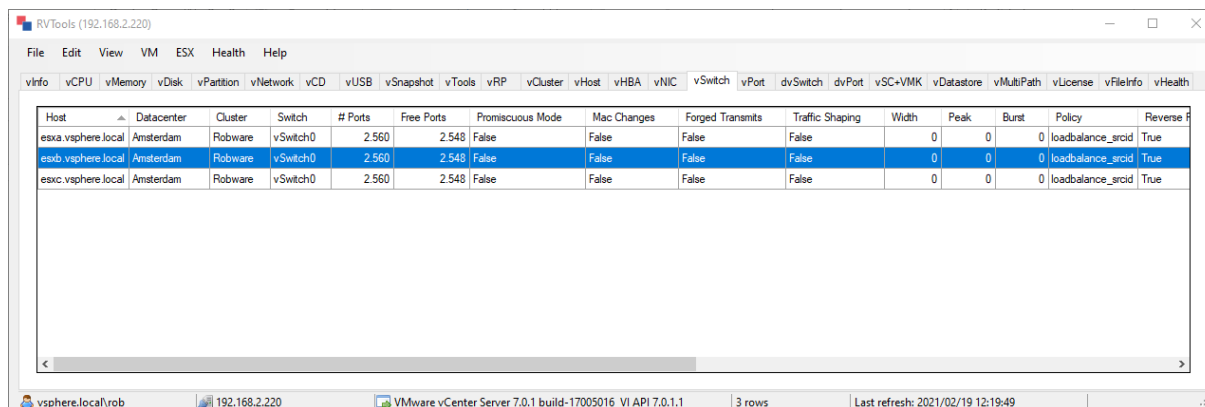
VI SDK Server which is used by RVTools to gather the information.

VI SDK UUID

A globally unique identifier associated with this service instance.

## vSwitch

The vSwitch tab displays for each virtual switch: the host name, datacenter name, cluster name, name of the switch, number of ports, free ports, promiscuous mode value, mac address changed allowed value, forged transmits allowed value, traffic shaping flag, width, peak, burst, teaming policy, reverse policy flag, notify switch value, rolling order, offload flag, TSO support flag, zero copy transmits support flag, maximum transmission unit size, VI SDK Server and VI SDK UUID.



Host	Datacenter	Cluster	Switch	# Ports	Free Ports	Promiscuous Mode	Mac Changes	Forged Transmits	Traffic Shaping	Width	Peak	Burst	Policy	Reverse P
esxa.vsphere.local	Amsterdam	Robware	vSwitch0	2.560	2.548	False	False	False	False	0	0	0	loadbalance_srcid	True
esxb.vsphere.local	Amsterdam	Robware	vSwitch0	2.560	2.548	False	False	False	False	0	0	0	loadbalance_srcid	True
esxc.vsphere.local	Amsterdam	Robware	vSwitch0	2.560	2.548	False	False	False	False	0	0	0	loadbalance_srcid	True

### Host

The name of the host where the switch is defined.

### Datacenter

The name of the datacenter where the switch is defined.

### Cluster

The name of the cluster where the switch is defined.

### Switch

The name of the virtual switch. Maximum length is 32 characters.

### # Ports

The number of ports that this virtual switch is configured to use. Changing this setting does not take effect until the next reboot. The maximum value is 1024, although other constraints, such as memory limits, may establish a lower effective limit.

### Free Ports

The number of ports that are available on this virtual switch. There are a number of networking services that utilize a port on the virtual switch and are not accounted for in the Port array of a Port Group. For example, each physical NIC attached to a virtual switch consumes one port. This property should be used when attempting to implement admission control for new services attaching to virtual switches.

### Promiscuous mode

Indicates if all traffic is seen on the port.

### Mac Changes

Indicates if the Media Access Control (MAC) address can be changed.

### Forged Transmits

Indicates if the virtual network adapter should be allowed to send network traffic with a different MAC address than that of the virtual network adapter.

### Traffic Shaping

Indicates if traffic shaper is enabled on the port.

### Width

The average bandwidth in bits per second if shaping is enabled on the port.

### Peak

The peak bandwidth during bursts in bits per second if traffic shaping is enabled on the port.

### Burst

The maximum burst size allowed in bytes if shaping is enabled on the port

### Policy

Network adapter teaming policy includes failover and load balancing, It can be one of the following:

- `loadbalance_ip`: route based on ip hash.
- `loadbalance_srcmac`: route based on source MAC hash.
- `loadbalance_srcid`: route based on the source of the port ID.
- `failover_explicit`: use explicit failover order.

### Reverse Policy

Indicates if the teaming policy is applied to inbound frames as well. For example, if the policy is explicit failover, a broadcast request goes through uplink1 and comes back through uplink2. Then if the reverse policy is set, the frame is dropped when it is received from uplink2. This reverse policy is useful to prevent the virtual machine from getting reflections.

### Notify Switch

Indicates whether to notify the physical switch if a link fails. If this property is true, ESX Server will respond to the failure by sending a RARP packet from a different physical adapter, causing the switch to update its cache.

### Rolling Order

Indicates whether to use a rolling policy when restoring links. For example, assume the explicit link order is (vmnic9, vmnic0), therefore vmnic9 goes down, vmnic0 comes up. However, when vmnic9 comes backup, if rollingOrder is set to be true, vmnic0 continues to be used, otherwise, vmnic9 is restored as specified in the explicitly order.



Offload

Offload capabilities are used to optimize virtual machine network performance. When a virtual machine is transmitting on a network, some operations can be offloaded to either the host or the physical hardware. This policy indicates what networking related operations should be offloaded. All virtual machines using this Port Group are subject to this policy. There is no setting for an individual virtual machine to determine if an operation should be offloaded.

TSO

Indicates if TCP segmentation offloading (TSO) is supported.

Zero Copy Xmit

Indicates if zero copy transmits are supported.

MTU

The maximum transmission unit (MTU) of the virtual switch in bytes.

VI SDK Server

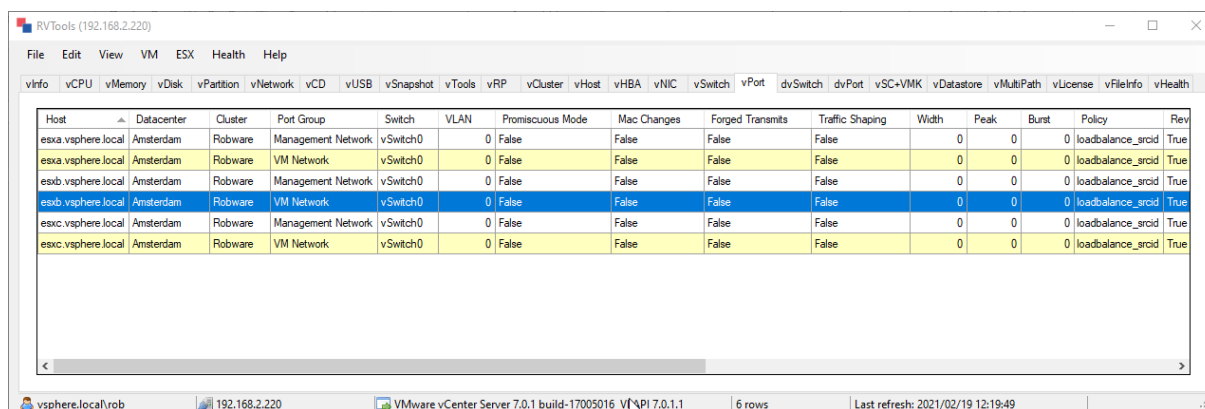
VI SDK Server which is used by RVTools to gather the information.

VI SDK UUID

A globally unique identifier associated with this service instance.

## vPort

The vPort tab displays for each port: the host name, datacenter name, cluster name, port group, name of the virtual switch where the port is defined, VLAN ID, promiscuous mode value, mac address changed allowed value, forged transmits allowed value, traffic shaping flag, width, peak and burst, teaming policy, reverse policy flag, notify switch value, rolling order, offload flag, TSO support flag, zero copy transmits support flag , VI SDK Server and VI SDK UUID.



Host	Datacenter	Cluster	Port Group	Switch	VLAN	Promiscuous Mode	Mac Changes	Forged Transmits	Traffic Shaping	Width	Peak	Burst	Policy	Rev
esxa.vsphere.local	Amsterdam	Robware	Management Network	vSwitch0	0	False	False	False	False	0	0	0	loadbalance_srid	True
esxa.vsphere.local	Amsterdam	Robware	VM Network	vSwitch0	0	False	False	False	False	0	0	0	loadbalance_srid	True
esxb.vsphere.local	Amsterdam	Robware	Management Network	vSwitch0	0	False	False	False	False	0	0	0	loadbalance_srid	True
esxb.vsphere.local	Amsterdam	Robware	VM Network	vSwitch0	0	False	False	False	False	0	0	0	loadbalance_srid	True
esxc.vsphere.local	Amsterdam	Robware	Management Network	vSwitch0	0	False	False	False	False	0	0	0	loadbalance_srid	True
esxc.vsphere.local	Amsterdam	Robware	VM Network	vSwitch0	0	False	False	False	False	0	0	0	loadbalance_srid	True

### Host

The name of the host where the port group is defined.

### Datacenter

The name of the datacenter where the port group is defined.

### Cluster

The name of the cluster where the port group is defined.

### Port Group

The name of the port group.

### Switch

The identifier of the virtual switch on which this port group is located.

### VLAN

The VLAN ID for ports using this port group. Possible values:

- A value of 0 specifies that you do not want the port group associated with a VLAN.
- A value from 1 to 4094 specifies a VLAN ID for the port group.
- A value of 4095 specifies that the port group should use trunk mode, which allows the guest operating system to manage its own VLAN tags.

**Note:** *Settings on the port group take precedence over the ones specified on the virtual switch.*

### Promiscuous mode

Indicates if all traffic is seen on the port.

### Mac Changes

Indicates if the Media Access Control (MAC) address can be changed.

### Forged Transmits

Indicates if the virtual network adapter should be allowed to send network traffic with a different MAC address than that of the virtual network adapter.

### Traffic Shaping

Indicates if traffic shaper is enabled on the port.

### Width

The average bandwidth in bits per second if shaping is enabled on the port.

### Peak

The peak bandwidth during bursts in bits per second if traffic shaping is enabled on the port.

### Burst

The maximum burst size allowed in bytes if shaping is enabled on the port

### Policy

Network adapter teaming policy includes failover and load balancing, It can be one of the following:

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- `loadbalance_srcid`: route based on the source of the port ID.
- `failover_explicit`: use explicit failover order.

### Reverse Policy

Indicates if the teaming policy is applied to inbound frames as well. For example, if the policy is explicit failover, a broadcast request goes through uplink1 and comes back through uplink2. Then if the reverse policy is set, the frame is dropped when it is received from uplink2. This reverse policy is useful to prevent the virtual machine from getting reflections.

### Notify Switch

Indicates whether to notify the physical switch if a link fails. If this property is true, ESX Server will respond to the failure by sending a RARP packet from a different physical adapter, causing the switch to update its cache.

### Rolling Order

Indicates whether to use a rolling policy when restoring links. For example, assume the explicit link order is (vmnic9, vmnic0), therefore vmnic9 goes down, vmnic0 comes up. However, when vmnic9 comes backup, if rollingOrder is set to be true, vmnic0 continues to be used, otherwise, vmnic9 is restored as specified in the explicitly order.

Offload

Offload capabilities are used to optimize virtual machine network performance. When a virtual machine is transmitting on a network, some operations can be offloaded to either the host or the physical hardware. This policy indicates what networking related operations should be offloaded. All virtual machines using this Port Group are subject to this policy. There is no setting for an individual virtual machine to determine if an operation should be offloaded.

TSO

Indicates if TCP segmentation offloading (TSO) is supported.

Zero Copy Xmit

Indicates if zero copy transmits are supported.

VI SDK Server

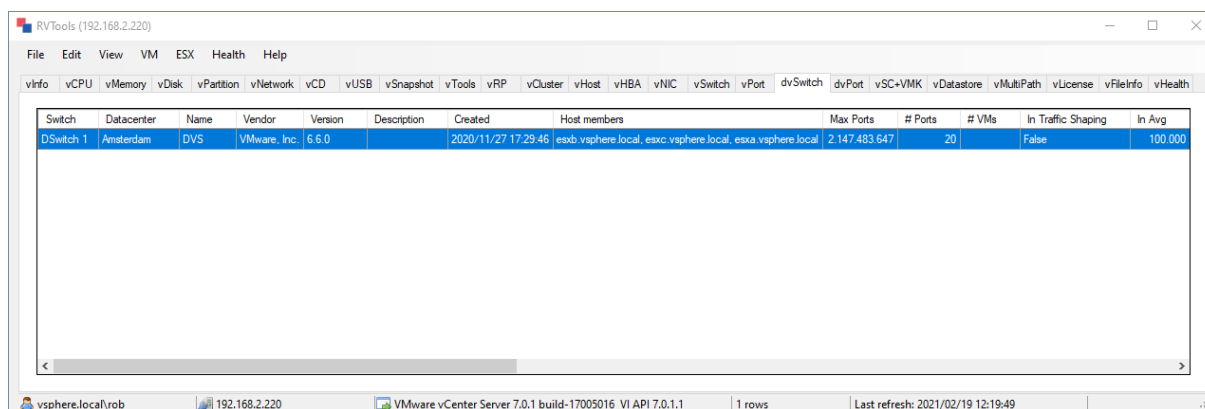
VI SDK Server which is used by RVTools to gather the information.

VI SDK UUID

A globally unique identifier associated with this service instance.

## dvSwitch

The dvSwitch tab displays for each distributed virtual switch the following properties: switch name, datacenter name, short product name, vendor, description, date created, host members, max ports, number of ports, number of connected VMs, traffic shaping values, CDP type, CDP operation, LACP name, LACP mode, LACP loadbalance Algorithm, max MTU, contact, name of responsible person, Object ID, custom attributes, tags, VI SDK Server and VI SDK UUID.



Switch	Datacenter	Name	Vendor	Version	Description	Created	Host members	Max Ports	# Ports	# VMs	In Traffic Shaping	In Avg
DSwitch 1	Amsterdam	DVS	VMware, Inc.	6.6.0		2020/11/27 17:29:46	esxb.vsphere.local, esxc.vsphere.local, esxa.vsphere.local	2147483647	20		False	100.000

### Switch

The name of the switch.

### Datacenter

The name of the datacenter.

### Name

Short form of the product name.

### Vendor

Name of the vendor of this product.

### Version

Dot-separated version string.

### Description

A description string of the switch.

### Created

The create time of the switch.

### Host members

The hosts that join the switch.

### Max Ports

The maximum number of ports allowed in the switch, not including conflict ports.

### # Ports

Current number of ports, not including conflict ports.

# VMs

Number of VMs connected to the switch.

In Traffic Shaping

Indicates if in-throughput traffic shaper is enabled on the port.

In Avg

The average in-throughput bandwidth in Kbits per second if shaping is enabled on the port

In Peak

The in-throughput peak bandwidth during bursts in Kbits per second if traffic shaping is enabled on the port.

In Burst

The maximum in-throughput burst size allowed in Kbytes if shaping is enabled on the port.

Out Traffic Shaping

Indicates if out-throughput traffic shaper is enabled on the port.

Out Avg

The average out-throughput bandwidth in Kbits per second if shaping is enabled on the port

Out Peak

The out-throughput peak bandwidth during bursts in Kbits per second if traffic shaping is enabled on the port.

Out Burst

The maximum out-throughput burst size allowed in Kbytes if shaping is enabled on the port.

CDP Type

Only for Virtual Switch from VMware! Indicates whether to advertise or listen.

NAME	DESCRIPTION
advertise	Sent discovery packets for the switch, but don't listen for incoming discovery packets.
both	Sent discovery packets for the switch and listen for incoming discovery packets.
listen	Listen for incoming discovery packets but don't sent discovery packet for the switch.
none	Don't listen for incoming discovery packets and don't sent discover packets for the switch either

CDP Operation

Only for Virtual Switch from VMware! The discovery protocol type.

NAME	DESCRIPTION
cdp	Cisco Discovery Protocol
lldp	Link Layer Discovery Protocol

LACP Name

The display name.

LACP mode

Link Aggregation Control Protocol policy modes.

Name	Description
active	Link Aggregation Control Protocol always sends frames along the configured uplinks
passive	Link Aggregation Control Protocol acts as "speak when spoken to".

LACP loadbalance Algorithm

Name	Description
destIp	Destination IP
destIpTcpUdpPort	Destination IP and TCP/UDP port number
destIpTcpUdpPortVlan	Destination IP, TCP/UDP port number and VLAN
destIpVlan	Destination IP and VLAN
destMac	Destination MAC address
destTcpUdpPort	Destination TCP/UDP port number
srcDestIp	Source and Destination IP
srcDestIpTcpUdpPort	Source and destination IP and TCP/UDP port number
srcDestIpTcpUdpPortVlan	Source and destination IP, source and destination TCP/UDP port number and VLAN.
srcDestIpVlan	Source and destination IP and VLAN
srcDestMac	Source and destination MAC address
srcDestTcpUdpPort	Source and destination TCP/UDP port number
srcIp	Source IP
srcIpTcpUdpPort	Source IP and TCP/UDP port number
srcIpTcpUdpPortVlan	Source IP, TCP/UDP port number and VLAN
srcIpVlan	Source IP and VLAN
srcMac	Source MAC address
srcPortId	Source Virtual Port Id
srcTcpUdpPort	Source TCP/UDP port number

vlan	VLAN only
------	-----------

Max MTU

Only for Virtual Switch from VMware! The maximum MTU in the switch.

Contact

The contact information for the human operator.

Admin Name

The name of the person who is responsible for the switch.

Object ID

VirtualCenter-specific 128-bit UUID of distributed switch, represented as a hexadecimal string.

Custom attributes

The custom attributes.

Cluster tags

Since version vSphere 6.5, tag information can be read from the CIS Rest API. Tags are only visible in RVTools when logged on with userid/password.

VI SDK Server

VI SDK Server which is used by RVTools to gather the information.

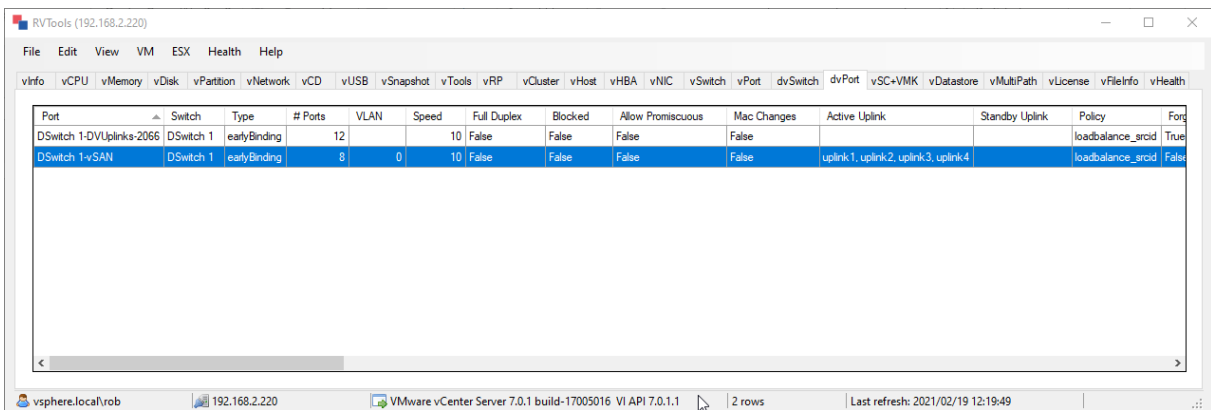
VI SDK UUID

A globally unique identifier associated with this service instance.



## dvPort

The dvPort tab displays for each distributed virtual port the following properties: name of portgroup, distributed switch name, portgroup type, number of ports, VLAN id, speed, Full duplex switch, blocked switch, allow promiscuous switch, Mac changes switch, active Uplink, standby uplink, policy, forged transmits switch, traffic shapping values, reverse policy switch, notify switch, rolling order, check beacon, live port moving switch, check duplex flag, check error % flag, check speed flag, block override flag, config reset switch, override shaping switch, vendor config override switch, security policy override switch, teaming override switch, VLAN override switch, Object ID, custom attributes, tags, VI SDK Server and VI SDK UUID.



### Port

The name of the portgroup.

### Switch

The DistributedVirtualSwitch that the portgroup is defined on. This property should always be set unless the user's setting does not have System.Read privilege on the object referred to by this property.

### Type

The type of portgroup.

NAME	DESCRIPTION
earlyBinding	A free DistributedVirtualPort will be selected and assigned to a virtual machine when the virtual machine is reconfigured to connect to the port group.
ephemeral	A DistributedVirtualPort will be created and assigned to a virtual machine when the virtual machine is powered on and will be deleted when the virtual machine is powered off. An ephemeral port group has no limit on the number of ports that can be a part of this port group. In cases where the vCenter Server is unavailable the host can create conflict ports in this port group to be used by a virtual machine at power on.
lateBinding	A free DistributedVirtualPort will be selected and assigned to a virtual machine when the virtual machine is powered on.

### # Ports

Number of ports in the portgroup.

**VLAN**

Only for Virtual Switch from VMware! The VLAN ID for ports. Possible values:  
A value of 0 specifies that you do not want the port associated with a VLAN. Value from 1 to 4094 specifies a VLAN ID for the port.

**Speed**

Only for Virtual Switch from VMware! Link speed.

**Full Duplex**

Only for Virtual Switch from VMware! Full Duplex switch.

**Blocked**

Blocked switch.

**Allow Promiscuous**

Only for Virtual Switch from VMware! Indicates if all traffic is seen on the port.

**Mac Changes**

Only for Virtual Switch from VMware! Indicates if the Media Access Control (MAC) address can be changed.

**Active Uplink**

Only for Virtual Switch from VMware! List of active uplink ports used for load balancing.

**Standby Uplink**

Only for Virtual Switch from VMware! Standby uplink ports used for failover.

**Policy**

Only for Virtual Switch from VMware Network adapter teaming policy. The policy defines the way traffic from the clients of the team is routed through the different uplinks in the team. The policies supported on the vDS platform is one of:

NAME	DESCRIPTION
failover_explicit	Use explicit failover order
loadbalance_ip	Routing based on IP hash
loadbalance_loadbased	Routing based by dynamically balancing traffic through the NICs in a team. This is the recommended teaming policy when the network I/O control feature is enabled for the vNetwork Distributed Switch.
loadbalance_srcid	Route based on the source of the port ID
loadbalance_srcmac	Route based on source MAC hash

**Forged Transmits**

Only for Virtual Switch from VMware! Indicates if the virtual network adapter should be allowed to send network traffic with a different MAC address than that of the virtual network adapter.

#### In Traffic Shaping

Indicates if in-throughput traffic shaper is enabled on the port.

#### In Avg

The average in-throughput bandwidth in Kbits per second if shaping is enabled on the port

#### In Peak

The in-throughput peak bandwidth during bursts in Kbits per second if traffic shaping is enabled on the port.

#### In Burst

The maximum in-throughput burst size allowed in Kbytes if shaping is enabled on the port.

#### Out Traffic Shaping

Indicates if out-throughput traffic shaper is enabled on the port.

#### Out Avg

The average out-throughput bandwidth in Kbits per second if shaping is enabled on the port

#### Out Peak

The out-throughput peak bandwidth during bursts in Kbits per second if traffic shaping is enabled on the port.

#### Out Burst

The maximum out-throughput burst size allowed in Kbytes if shaping is enabled on the port.

#### Reverse Policy

Only for Virtual Switch from VMware! Indicates if the teaming policy is applied to inbound frames as well.

#### Notify Switch

Only for Virtual Switch from VMware! Indicates whether to notify the physical switch if a link fails.

#### Rolling Order

Only for Virtual Switch from VMware! Indicates whether to use a rolling policy when restoring links.

#### Check Beacon

Only for Virtual Switch from VMware! Indicates whether to enable this property to enable beacon probing as a method to validate the link status of a physical network adapter. checkBeacon can be enabled only if the VirtualSwitch has been configured to use the beacon. Attempting to set checkBeacon on a PortGroup or VirtualSwitch that does not have beacon probing configured for the applicable VirtualSwitch results in an error.

### Live Port Moving

Allow a live port to be moved in and out of the portgroup.

### Check Duplex

Only for Virtual Switch from VMware! Indicates whether to use the link duplex reported by the driver as link selection criteria. If true, then fullDuplex is the configured duplex mode. The link is considered bad if the link duplex reported by driver is not the same as fullDuplex. If false, then fullDuplex is unused, and link duplexity is not used as a detection method.

### Check Error %

Only for Virtual Switch from VMware! Indicates whether to use link error percentage to detect failure. If true, then percentage is the configured error percentage that is tolerated. The link is considered bad if error rate exceeds percentage. If false, percentage is unused, and error percentage is not used as a detection method.

### Check Speed

Only for Virtual Switch from VMware! To use link speed as the criteria, *checkSpeed* must be one of the following values:

- exact: Use exact speed to detect link failure. speed is the configured exact speed in megabits per second.
- minimum: Use minimum speed to detect failure. speed is the configured minimum speed in megabits per second.
- empty string: Do not use link speed to detect failure. speed is unused in this case.

### Percentage

Only for Virtual Switch from VMware. See Check Error%.

### Block Override

Allow the blocked setting of an individual port to override the default setting of a portgroup.

### Config Reset

If true, reset the port network setting back to the portgroup setting (thus removing the per-port setting) when the port is disconnected from the connectee.

### Shaping Override

Allow the inShaping Policy or outShaping Policy settings of an individual port to override the default setting of a portgroup.

### Vendor Config Override

Allow the vendor specific configuration setting of an individual port to override the default setting of a portgroup.

### Sec. Policy Override

Only for Virtual Switch from VMware! Allow the setting of security policy for an individual port to override the default setting of a portgroup.

### Teaming Override

Only for Virtual Switch from VMware! Allow the setting of uplink teaming policy for an individual port to override the default setting of a portgroup.

### VLAN Override

Only for Virtual Switch from VMware! Allow the setting of VLAN ID, trunk VLAN ID, or primary VLAN ID for an individual port to override the default setting of a portgroup.

### Object ID

VirtualCenter-specific 128-bit UUID of distributed switch, represented as a hexadecimal string.

### Custom attributes

The custom attributes.

### Tags

Since version vSphere 6.5, tag information can be read from the CIS Rest API. Tags are only visible in RVTools when logged on with userid/password.

### VI SDK Server

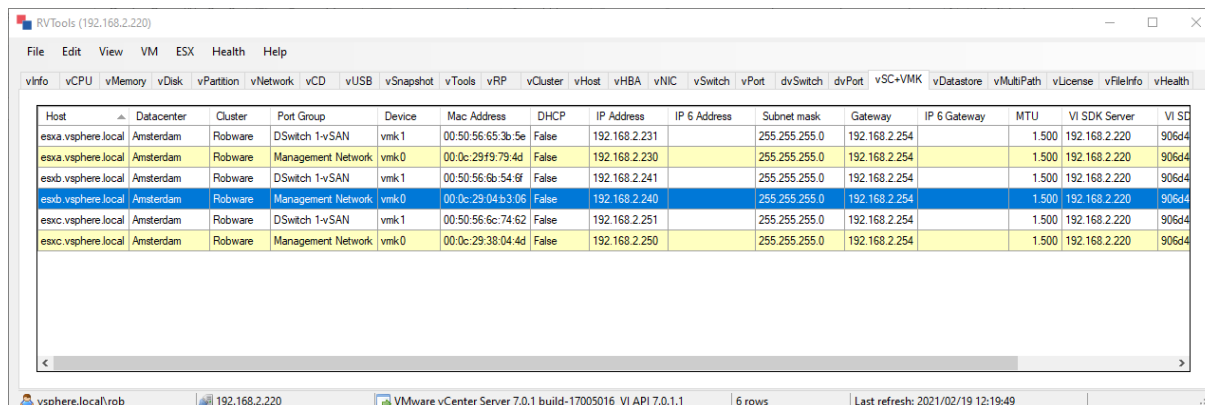
VI SDK Server which is used by RVTools to gather the information.

### VI SDK UUID

A globally unique identifier associated with this service instance.

## vSC+VMK

The vSC+VMK tab displays for each service console and VMkernel: the host name, datacenter name, cluster name, port group, device, mac address, DHCP flag, IP address, IP 6 address, subnet mask, gateway address, gateway IP 6 address, VI SDK Server and VI SDK UUID.



Host	Datacenter	Cluster	Port Group	Device	Mac Address	DHCP	IP Address	IP 6 Address	Subnet mask	Gateway	IP 6 Gateway	MTU	VI SDK Server	VI SDK
esxa.vsphere.local	Amsterdam	Robware	DSwitch 1-vSAN	vmk1	00:50:56:65:3b:5e	False	192.168.2.231		255.255.255.0	192.168.2.254		1.500	192.168.2.220	906d4
esxa.vsphere.local	Amsterdam	Robware	Management Network	vmk0	00:0c:29f9:79:4d	False	192.168.2.230		255.255.255.0	192.168.2.254		1.500	192.168.2.220	906d4
esxb.vsphere.local	Amsterdam	Robware	DSwitch 1-vSAN	vmk1	00:50:56:6b:54:6f	False	192.168.2.241		255.255.255.0	192.168.2.254		1.500	192.168.2.220	906d4
esxb.vsphere.local	Amsterdam	Robware	Management Network	vmk0	00:0c:29:04:b3:06	False	192.168.2.240		255.255.255.0	192.168.2.254		1.500	192.168.2.220	906d4
esxc.vsphere.local	Amsterdam	Robware	DSwitch 1-vSAN	vmk1	00:50:56:6c:74:62	False	192.168.2.251		255.255.255.0	192.168.2.254		1.500	192.168.2.220	906d4
esxc.vsphere.local	Amsterdam	Robware	Management Network	vmk0	00:0c:29:38:04:4d	False	192.168.2.250		255.255.255.0	192.168.2.254		1.500	192.168.2.220	906d4

### Host

The name of the host where the service console or VMkernel is defined.

### Datacenter

The name of the datacenter where the service console or VMkernel is defined.

### Cluster

The name of the cluster where the service console or VMkernel is defined.

### Port group

If the vnic is connecting to a vSwitch, this property is the name of port group connected. If the vnic is connecting to a DistributedVirtualSwitch, this property is ignored.

### Device

VirtualNic device to which configuration applies.

### Mac Address

The media access control (MAC) address of the virtual network adapter.

### DHCP

Indicates if DHCP (dynamic host control protocol) is enabled. If this property is set to true, the ipAddress and the subnetMask strings cannot be set explicitly.

### IP Address

The IP address currently used by the network adapter. All IP addresses are specified using IPv4 dot notation. For example, "192.168.0.1". Subnet addresses and netmasks are specified using the same notation.

*Note: When DHCP is enabled, this property reflects the current IP configuration and cannot be set. When DHCP is not enabled, this property can be set explicitly.*

IP 6 Address

The IP 6 address currently used by the network adapter.

Subnet Mask

The subnet mask.

*Note: When DHCP is not enabled, this property can be set explicitly. When DHCP is enabled, this property reflects the current IP configuration and cannot be set.*

Gateway

The default gateway address.

IP 6 Gateway

The default IP 6 gateway address.

VI SDK Server

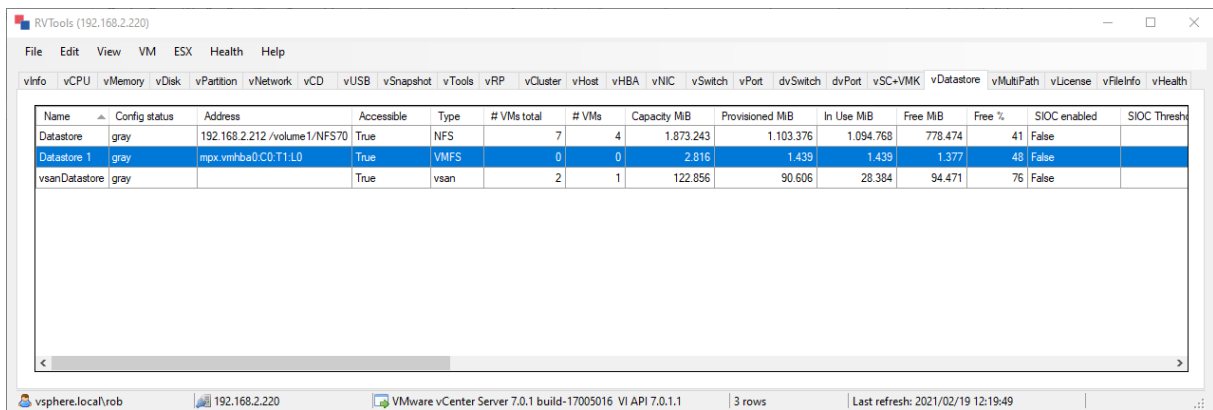
VI SDK Server which is used by RVTools to gather the information.

VI SDK UUID

A globally unique identifier associated with this service instance.

## vDatastore

The "vDatastore" tab displays for each datastore: the name, config status, connectivity status, file system type, total number of VM's on this datastore, number of running virtual machines on this datastore, total capacity (in MiBs), Total provisioned storage (in MiBs), Used storage (in MiBs), shared storage (in MiBs), free capacity (in MiBs), SIOC enabled flag, SIOC congested threshold value, number of hosts connected, names of connected hosts, datastore cluster name, datastore cluster capacity, datastore cluster free space, block size, max blocks, number of extents, major version number, version string, upgradeable status flag, multiple host access indication, url address, Object ID, custom attributes, tags, VI SDK Server and VI SDK UUID.



Name	Config status	Address	Accessible	Type	# VMs total	# VMs	Capacity MB	Provisioned MB	In Use MB	Free MB	Free %	SIOC enabled	SIOC Thresh
Datastore	gray	192.168.2.212 /volume1/NFS70	True	NFS	7	4	1,873,243	1,103,376	1,094,768	778,474	41	False	
Datastore 1	gray	mpx.vmhba0.C0.T1.L0	True	VMFS	0	0	2,816	1,439	1,439	1,377	48	False	
vsanDatastore	gray		True	vsan	2	1	122,856	90,606	28,384	94,471	76	False	

### Name

The name of the datastore.

### Config status

The config status indicates if the system has detected a configuration issue involving this datastore. The meanings of the config status values are:

- red: A problem has been detected involving the entity.
- yellow: A problem is about to occur, or a transient condition has occurred (For example, reconfigure fail-over policy).
- green: No configuration issues have been detected.
- gray: The configuration status of the entity is not being monitored.

A green status indicates only that a problem has not been detected; it is not a guarantee that the entity is problem-free. Config issues are displayed on the vHealth tab page.

### Address

The full device's address (controller, target, device)

### Accessible

The connectivity status of this datastore. If this is set to false, meaning the datastore is not accessible, this datastore's capacity and freespace properties cannot be validated. Furthermore, if this property is set to false, the url properties should not be used.

### Type

Type of file system volume, such as VMFS or NFS.



# VMs total

Total number of virtual machines on this datastore.

# VMs

Total number of running virtual machines on this datastore.

Capacity MiB

Maximum capacity of this datastore (in MiBs).

Provisioned MiB

Total storage space (in MiBs) potentially used by all the virtual machines on this datastore.

In Use MiB

Total storage space (in MiBs) on this datastore actually being used.

Free MiB

Free space on the datastore (in MiBs).

Free %

Percentage free space on the datastore.

SIOC Enabled

Indicates if the service is enabled.

SIOC Threshold

The latency beyond which the storage array is considered congested.

# Hosts

Number of hosts which are connected to the datastore.

Hosts

Host names of all hosts which are connected to the datastore.

Datastore cluster name

The name of the storage pod.

Datastore cluster capacity

Total capacity of this storage pod (in MiBs). This value is the sum of the capacity of all datastores that are part of this storage pod and is updated periodically by the server.

Datastore cluster free space

Total free space on this storage pod (in MiBs). This value is the sum of the free space on all datastores that are part of this storage pod and is updated periodically by the server.

Block size

Block size of VMFS. Determines maximum file size. The maximum number of blocks is typically fixed with each specific version of VMFS. To increase the maximum size of a VMFS file, increase the block size. The minimum block size is 1MiB.

Max Blocks

Maximum number of blocks. Determines maximum file size along with blockSize. See information about the blockSize. In VMFS2, this number is 466,944. In VMFS3, this number is 786,432.

# Extents

The total number of extents.

Major Version

Major version number of VMFS.

Version

Version string. Contains major and minor version numbers.

VMFS Upgradeable

Indication if the filesystem can be upgraded to a newer version

MHA

Multiple Host Access. More than one host in the datacenter has been configured with access to the datastore. This information is only provided by VirtualCenter.

URL

The unique locator for the datastore. This property is guaranteed to be valid only if accessible is true.

Object ID

VirtualCenter-specific 128-bit UUID of distributed switch, represented as a hexadecimal string.

Custom attributes

The custom attributes.

Tags

Since version vSphere 6.5, tag information can be read from the CIS Rest API. Tags are only visible in RVTools when logged on with userid/password.

VI SDK Server

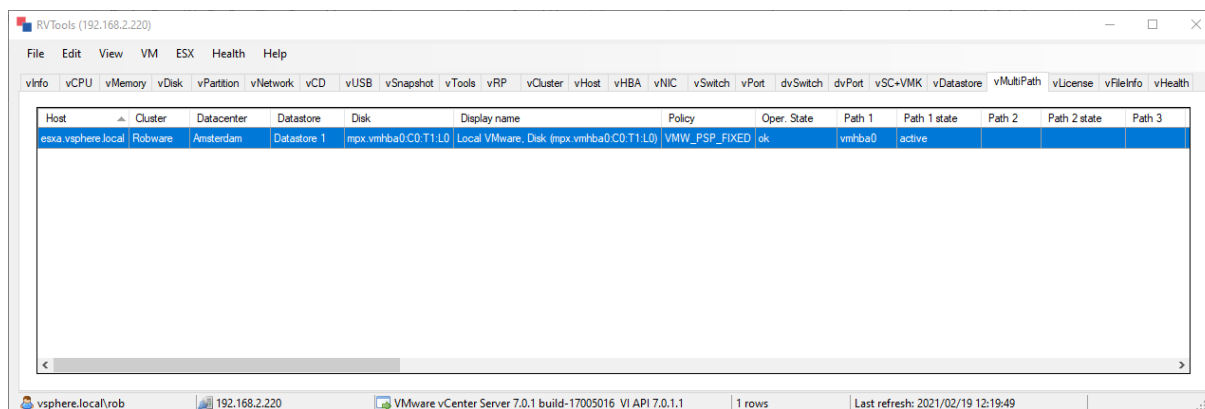
VI SDK Server used by RVTools to gather the information.

VI SDK UUID

A globally unique identifier associated with this service instance.

## vMultiPath

The "vMultiPath" tab displays for all datastores per host: the hostname, cluster name, datacenter name, datastore name, disk name, display name, policy, operational state, paths (8), path states (8), vStorage support, vendor, model, revision, level, uuid, object id, VI SDK Server and VI SDK UUID.



### Host

The name of the host where the service console or VMkernel is defined.

### Datacenter

The name of the datacenter where the service console or VMkernel is defined.

### Cluster

The name of the cluster where the service console or VMkernel is defined.

### Datastore

The name of the datastore.

### Disk

Name of the SCSI disk device on which a VMware File System (VMFS) extent resides.

### Display name

User configurable display name of the SCSI logical unit. A default display name will be used if available. If the display name is not supported, it will be unset. The display name does not have to be unique but it is recommended that it be unique.

### Policy

Policy that the logical unit should use when selecting a path.

NAME	DESCRIPTION
VMW_PSP_FIXED	Use a preferred path whenever possible.
VMW_PSP_RR	Load balance
VMW_PSP_MRU	Use the most recently used path.

Operational state

The operational states of the LUN. When more than one item is present in the array, the first state should be considered the primary state. For example, a LUN may be "ok" and "degraded" indicating I/O is still possible to the LUN, but it is operating in a degraded mode.

Path 1 through 8

Array of paths available to access this LogicalUnit.

Path 1 through 8 state

System-reported state of the path. Must be one of the following values:

NAME	DESCRIPTION
active	Path can be used for I/O.
standby	Path can be used for I/O if active paths fail.
disabled	Path has been administratively disabled.
dead	Path cannot be used for I/O.
unknown	Path is in unknown error state.

vStorage

Storage array hardware acceleration support status. When a host boots, the support status is unknown. As a host attempts hardware-accelerated operations, it determines if the storage device supports hardware acceleration and sets the vStorageSupport property accordingly.

NAME	DESCRIPTION
vStorageSupported	Storage device supports hardware acceleration. The ESX host will use the feature to offload certain storage-related operations to the device.
vStorageUnknown	Initial support status value.
vStorageUnsupported	Storage device does not support hardware acceleration. The ESX host will handle all storage-related operations.

Vendor

The vendor of the SCSI device

Model

The model number of the SCSI device.

Revision

The revision of the SCSI device.

Level

The SCSI level of the SCSI device.

UUID

Universally unique identifier for the LUN used to identify ScsiLun across multiple servers.

Object id

For internal use.

VI SDK Server

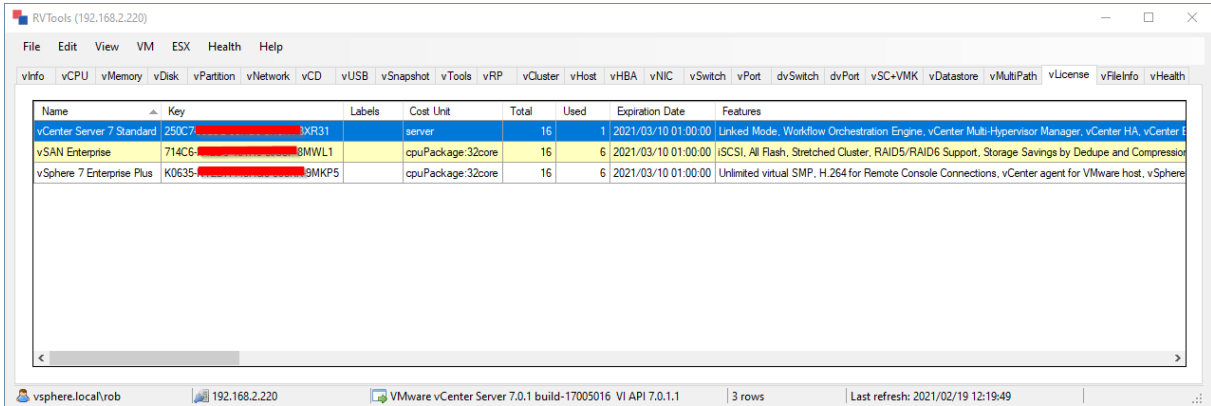
VI SDK Server which is used by RVTools to gather the information.

VI SDK UUID

A globally unique identifier associated with this service instance.

## vLicense

The “vLicense” tab displays information about your licenses. For each license: name of the licensed product, license key, labels, cost unit, total licenses, used licenses, expiration date, features, VI SDK Server and VI SDK UUID.



The screenshot shows the RVTools application window with the vLicense tab selected. The table displays the following data:

Name	Key	Labels	Cost Unit	Total	Used	Expiration Date	Features
vCenter Server 7 Standard	250C7-██████████████-██████████	XRF31	server	16	1	2021/03/10 01:00:00	Linked Mode, Workflow Orchestration Engine, vCenter Multi-Hypervisor Manager, vCenter HA, vCenter E
vSAN Enterprise	714C6-██████████████-██████████	8MWL1	cpuPackage:32core	16	6	2021/03/10 01:00:00	iSCSI, All Flash, Stretched Cluster, RAID5/RAID6 Support, Storage Savings by Dedupe and Compression
vSphere 7 Enterprise Plus	K0635-██████████████-██████████	5MKP5	cpuPackage:32core	16	6	2021/03/10 01:00:00	Unlimited virtual SMP, H.264 for Remote Console Connections, vCenter agent for VMware host, vSphere

*Note: You must have permissions to see the licenses. Check chapter permissions.*

### Name

Display name of the license.

### Key

License key.

### Labels

Labels for this license.

### Cost unit

The cost unit for this license.

### Total

Total number of licenses.

### Used

Used number of licenses.

### Expiration data

License expiration date.

### Features

List of license features

### VI SDK Server

VI SDK Server which is used by RVTools to gather the information.

### VI SDK UUID

A globally unique identifier associated with this service instance.

## vFileInfo

The "vFileInfo" tab will display all files of all datastores. For each file: Friendly Path Name, File Name, File Type, File size in bytes, Path, Internal Sort Column, VI SDK server and VI SDK UUID are displayed.

Friendly Path Name	File Name	File Type	File Size in bytes	Path
[Datastore] #recycle/	desktop.ini	FileInfo	74	[Datastore] #recycle/
[Datastore] vSphere-HA/FDM-906d4686-5d40-4b72-812d-d350ca6c-304e-2031-3b11c9f-vc/	host-2037-hb	FileInfo	8	[Datastore] vSphere-HA/FDM-906d4686-5d40-4b72-812d-d350ca6c-304e-2031-3b11c9f-vc/
[Datastore] vSphere-HA/FDM-906d4686-5d40-4b72-812d-d350ca6c-304e-2031-3b11c9f-vc/	host-2037-powerson	FileInfo	123	[Datastore] vSphere-HA/FDM-906d4686-5d40-4b72-812d-d350ca6c-304e-2031-3b11c9f-vc/
[Datastore] vSphere-HA/FDM-906d4686-5d40-4b72-812d-d350ca6c-304e-2031-3b11c9f-vc/	host-2040-hb	FileInfo	8	[Datastore] vSphere-HA/FDM-906d4686-5d40-4b72-812d-d350ca6c-304e-2031-3b11c9f-vc/
[Datastore] vSphere-HA/FDM-906d4686-5d40-4b72-812d-d350ca6c-304e-2031-3b11c9f-vc/	host-2040-powerson	FileInfo	131	[Datastore] vSphere-HA/FDM-906d4686-5d40-4b72-812d-d350ca6c-304e-2031-3b11c9f-vc/
[Datastore] vSphere-HA/FDM-906d4686-5d40-4b72-812d-d350ca6c-304e-2031-3b11c9f-vc/	host-2043-hb	FileInfo	8	[Datastore] vSphere-HA/FDM-906d4686-5d40-4b72-812d-d350ca6c-304e-2031-3b11c9f-vc/
[Datastore] vSphere-HA/FDM-906d4686-5d40-4b72-812d-d350ca6c-304e-2031-3b11c9f-vc/	host-2043-powerson	FileInfo	74	[Datastore] vSphere-HA/FDM-906d4686-5d40-4b72-812d-d350ca6c-304e-2031-3b11c9f-vc/
[Datastore] vSphere-HA/FDM-906d4686-5d40-4b72-812d-d350ca6c-304e-2031-3b11c9f-vc/	protectedlist	FileInfo	4,096	[Datastore] vSphere-HA/FDM-906d4686-5d40-4b72-812d-d350ca6c-304e-2031-3b11c9f-vc/
[Datastore] Debian_template_1/	Debian_template.nvram	VmNvramFileInfo	8,634	[Datastore] Debian_template_1/
[Datastore] Debian_template_1/	Debian_template.vmdk	VmDiskFileInfo	136,712,192	[Datastore] Debian_template_1/
[Datastore] Debian_template_1/	Debian_template.vmsd	FileInfo	0	[Datastore] Debian_template_1/

### Friendly Path Name

Friendly Path name

### File Name

Name of the file.

### File Type

File type.

### File Size in bytes

File size in bytes.

### Path

Path name.

### Internal Sort Column

Used for sorting the data.

### VI SDK Server

VI SDK Server which is used by RVTools to gather the information.

### VI SDK UUID

A globally unique identifier associated with this service instance.

## vHealth

The "vHealth" tab will display the health check messages.

Name	Message	Message type	VI SDK Server	VI SDK UUID
[vsanDatastore] BLABLA/BLA.vmdk	Possibly a Zombie vmdk file! Please check.	Zombie	192.168.2.220	906d4686-5d40-4b-72-812d-...
[vsanDatastore] BLABLA/BLA.vmx	Possibly a Zombie VM! Please check.	Zombie	192.168.2.220	906d4686-5d40-4b-72-812d-...
Debian_template	Inconsistent Foldername! VMname = Debian_template Foldername = Debian_template_1	Foldername	192.168.2.220	906d4686-5d40-4b-72-812d-...
esxa.vsphere.local	NTPD service is not running!	NTPD	192.168.2.220	906d4686-5d40-4b-72-812d-...
esxa.vsphere.local	NTP Server value is null!	NTP	192.168.2.220	906d4686-5d40-4b-72-812d-...
esxa.vsphere.local	Host esxa.vsphere.local in cluster Robware in Amsterdam currently has no management network redun...	Host config	192.168.2.220	906d4686-5d40-4b-72-812d-...
esxb.vsphere.local	ESXi Shell service is running!	Security	192.168.2.220	906d4686-5d40-4b-72-812d-...
esxb.vsphere.local	SSH service is running!	Security	192.168.2.220	906d4686-5d40-4b-72-812d-...
esxb.vsphere.local	Host esxb.vsphere.local in cluster Robware in Amsterdam currently has no management network redun...	Host config	192.168.2.220	906d4686-5d40-4b-72-812d-...
esxb.vsphere.local	ESXi Shell for the host esxb.vsphere.local has been enabled	Host config	192.168.2.220	906d4686-5d40-4b-72-812d-...
esxb.vsphere.local	SSH for the host esxb.vsphere.local has been enabled	Host config	192.168.2.220	906d4686-5d40-4b-72-812d-...
esxb.vsphere.local	NTP Server value is null!	NTP	192.168.2.220	906d4686-5d40-4b-72-812d-...

There are 24 possible "Health Check" messages:

1. VM has a CDROM device connected!
2. VM has a Floppy device connected!
3. VM has an active snapshot!
4. VMware tools are out of date, not running or not installed!
5. On disk xx is yy% disk space available! The threshold value is zz%
6. On datastore xx is yy% disk space available! The threshold value is zz%
7. There are xx virtual CPUs active per core on this host. The threshold value is zz
8. There are xx VMs active on this datastore. The threshold value is zz
9. Possibly a zombie vmdk file! Please check.
10. Possibly a zombie vm! Please check.
11. Inconsistent Folder Names
12. Multipath operational state
  - Degraded = One or more paths to the LUN are down, but I/O is still possible.
  - Further path failures may result in lost connectivity.
  - error = The LUN is dead and/or not reachable.
  - lostCommunication = No more paths are available to the LUN.
  - Off = The LUN is off.
13. Virtual machine consolidation needed
14. Search datastore errors.
15. VM config issues
16. Host config issues
17. NTP issues
18. Cluster config issues
19. Datastore config issues
20. Warning if ESXi shell is enabled on host
21. Warning if SSH is enabled on host
22. Disk I/O performance tip
23. In-memory performance tip
24. Certificate within xx days of expiring or has expired.



## VMWARE VM Performance optimization considerations

The performance optimizer & founder of [www.fulldata.nl](http://www.fulldata.nl) Henk van der Valk ([Henk@fulldata.nl](mailto:Henk@fulldata.nl)) gave me two performance tips for VMs that I could incorporate into RVTools. And of course, I did. Thanks Henk!

### DISK I/O

#### **General performance rule:**

VM Disk volumes connected via PVSCSI disk controllers perform better. (VM Disks connected via IDE/SATA are often still used as boot disk volumes).

#### **Performance check**

If number of disks connected to VM > 3 then check if under [SCSI] multiple PVSCSI Controllers are registered with the VM. Volumes should be spread & balanced across the multiple controllers for lowest latency and optimal performance.

#### **RVTools implementation**

If VM is running and number of connected disks > 3 and total disk size is > 750+ GB and number of Paravirtual SCSI controllers is < 2 then a performance tip is shown in vHealth tab page.

### In-Memory VM performance

Many applications are memory intense and benefit from the lowest memory latency possible. There are some VM settings that impact memory access timings overall, like the use of Uniform memory access (UMA) versus NUMA (Non uniform memory access). Applications like SQL Server that are NUMA *aware* benefit from running with a NUMA configuration.

The main difference between the two is usage of fast 'local' vs slower 'far' memory. In UMA mode, all memory is placed in one large memory pool with consistent but slower access timings. Leveraging local NUMA memory results in up to 25% - 35% faster memory access timings. VM's with 4 or more CPU's typically benefit from leveraging NUMA settings.

To activate VM Numa support we have to shut down and edit the VM following settings:

1. Disable: EnableCPU Hot ADD
2. Disable: Memory Hot Plug
3. Configure 4+ cores per socket (vs the default of only 1 Core per Socket)
4. When possible: Enable: Reserve all Guest memory (All Locked).

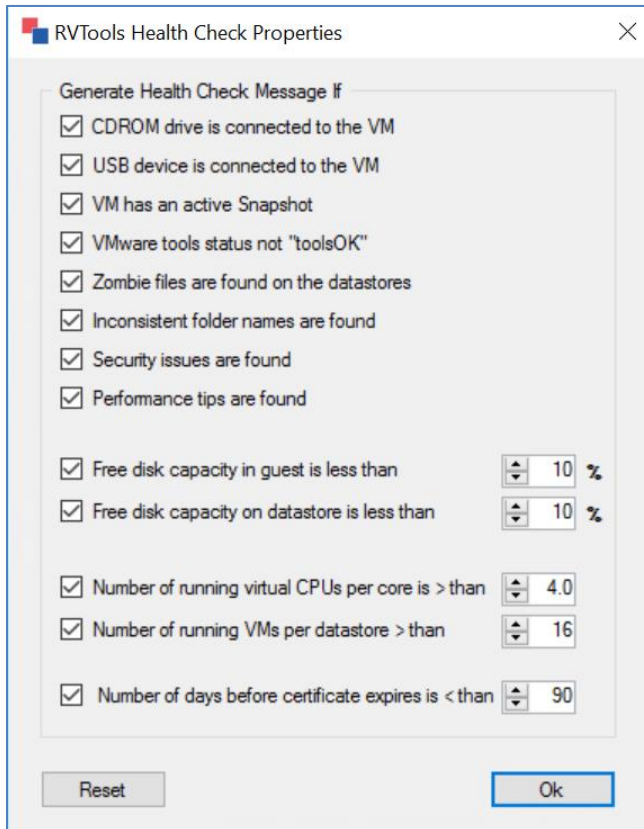
*Note: the 'Hot Add CPU & Hot Add Memory' features are great options that help to simplify day to day operations, but they may limit overall performance. When the scale up flexibility isn't needed then disable them for best performance.*

#### **RVTools implementation**

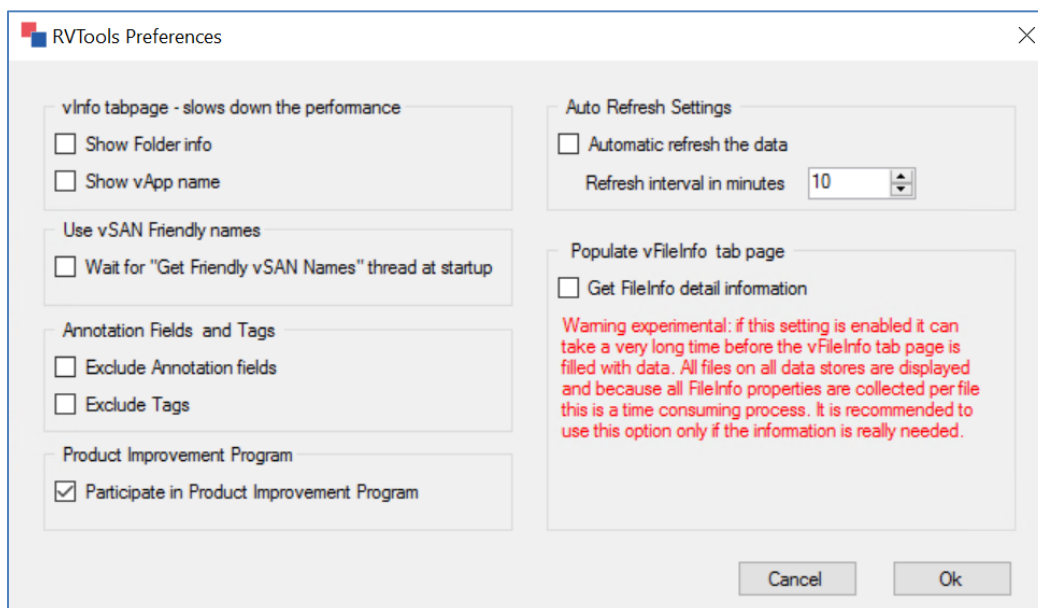
If VM is running and number of cores >= 4 and vnumaOnCpuHotaddExposed setting is false and CPU hot add is enabled or Memory hot add is enabled or one core per socket then a performance tip in vHealth tab page is shown.

## Health properties

On the properties form you can set your own thresholds and choose which health checks to execute or to skip.



## Preferences



### Show Folder info

If set the VM folder path in vCenter is displayed.

### Show vApp name

If set the vApp name is displayed,

### Wait for "Get Friendly vSan Names" thread at startup

If set RVTools will wait until "Get Friendly vSan Names" thread is finished. This makes sense if you are using a vSAN and you want to see the friendly vSAN name instead of the UUIDs

### Exclude Annotation fields

If set the annotation fields (aka custom attributes) are displayed.

### Exclude Tags

If set the tags are displayed. This will only work for vSphere 6.5 and higher and when you use a userid and password for login.

### Auto refresh the data

If set RVTools will reload the data for the set interval.

### Get FileInfo

If set all files on all datastores are displayed. Only do this for debugging or if the information is needed for sizing. This can take a very long time!

It is probably a better idea to collect this information overnight through the RVTools CLI. Use the CLI switch -GetFileInfo for this.

## Communication

The default ports that the VirtualCenter Server uses to listen for connections from the VI Client are ports 80, 443, and 902. The VirtualCenter Server also uses port 443 to listen for data transfer from the VI Web Access Client and other SDK clients.

RVTools is using the https protocol and port 443 to communicate with the VI SDK.

## Permissions

The user who starts RVTools must have at least read-only access to vSphere to see (most) of the information. This chapter describes a couple vSphere roles and what this means for the information displayed by RVTools.

### Read-only role

- Disconnect Floppy is not working
- Disconnect CD is not working
- Upgrade VMware Tools is not working
- License information is not visible
- Search Datastore health checks are not working

### Virtual machine user role

- License information not visible
- Search Datastore health checks are not working

### Virtual machine power user role

- License information not visible

### Administrator

- All information is visible

If you clone the virtual machine power user role to let's say "Virtual machine power user+" role and add global | license access to this new role, then you don't have to be an administrator to see all the information.

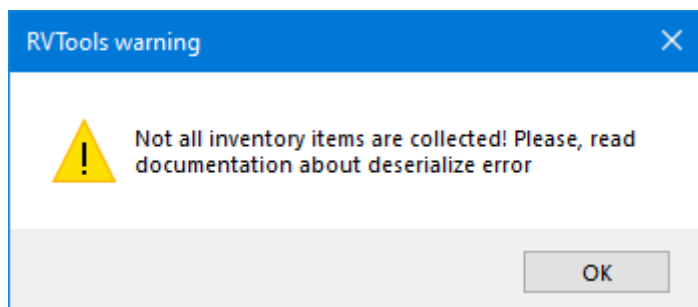
## **MB versus MiB**

Since version 4.10 the column names containing KB or MB have been changed to KiB and MiB because there has been quite a bit of confusion about this. vSphere values KB and MB should actually be KiB and MiB.

Based on [@Glenn Sizemore blog](#) vCenter shows label “GB” but are “GiB” .

## Deserialize error

Since version 4.1.0, RVTools will display a warning message if not all VM inventory is collected. In most cases VMs that need to be consolidated and have a large amount of disk files is the cause of the deserialization problem. Once VMs are consolidated, RVTools will display all your VM's.



Prior to version 4.1.0, this error was not detected by RVTools and an incomplete VM inventory was possible.

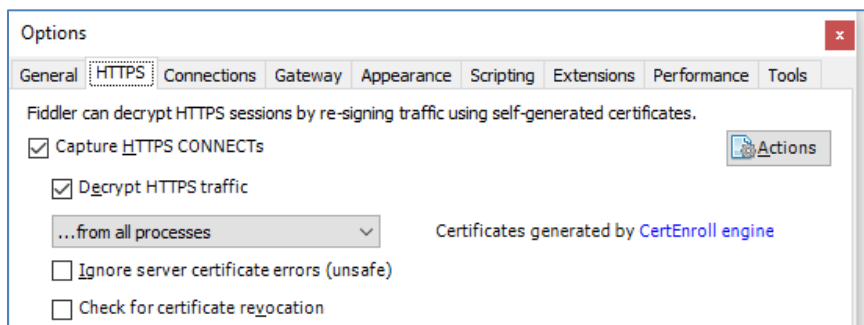
Recommended troubleshooting steps:

1. Run the PowerShell script "RVToolsFindBadVM.ps1" located in the RVTools installation folder (default location: C:\Program Files (x86)\Dell\RVTools). This script is looking for VMs which need to be consolidated.
  - a. When prompted, enter the hostname or IP address of the "target" that gave you the error.
2. Consolidate the VMs and look for the cause of the high number of disk files. Usually, it concerns a configuration problem of the backup software.
3. Rerun RVTools.

As an alternative to the above PowerShell script, download and install fiddler.  
<https://www.telerik.com/download/fiddler>

Activate the RVTools debug option.

- Stop the RVTools application if it's running
- Go to RVTools program directory
- Open the file log4net.config with notepad or your favorite editor
- Change the line `<level value="INFO" />` to `<level value="DEBUG" />`
- Save the file
- Start Fiddler and set the decrypt https traffic setting (see below)
- Start RVTools
- Login and wait till the vInfo tab page is displayed
- Stop RVTools
- Change the line `<level value="DEBUG" />` back to `<level value="INFO" />`

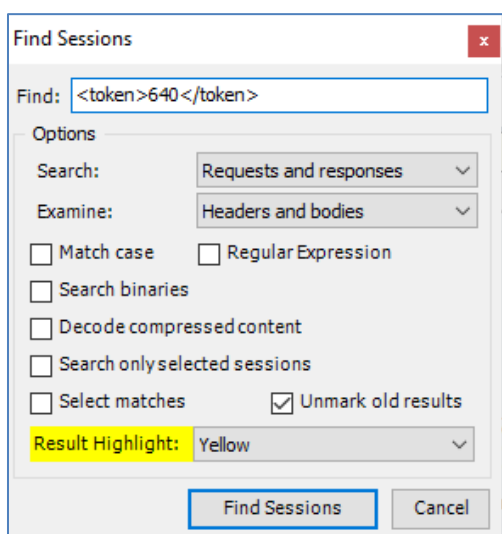


Open RVTools debug file in notepad++ and search for string "VirtualMachine result token" (find all in current document). Get the last one found as example:

```
Line 1168: 2020-09-19 00:55:47,271 DEBUG RVTools.VISDK
retrievePropertiesEx VirtualMachine result token: 639
```

VM #639 is, in this example, the last VM which has no deserialize problem. So, the VM with issues is #640.

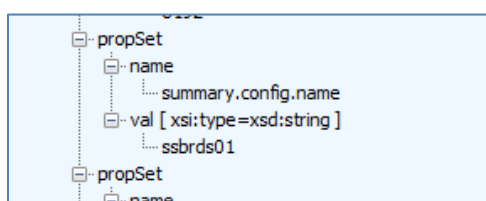
Search in fiddler trace for session with string "<token>640</token>"



745	20:55:...	200	HTTPS	a0410pvcsapp10	/sdk	30.260	no-cache	text/xml; c...	rvtools:3968
746	20:55:...	200	HTTPS	a0410pvcsapp10	/sdk	877.233	no-cache	text/xml; c...	rvtools:3968
747	20:55:...	200	HTTPS	a0410pvcsapp10	/sdk	665	no-cache	text/xml; c...	rvtools:3968

Open session as xml and expand all.

In the expanded xml screen, you can find the name of the VM in the string of summary.config.name



## Password encryption

To improve security, RVTools is changing its method of password encryption used when running the command line version of RVTools.

RVToolsPasswordEncryption.ps1 is replacing RVToolsPasswordEncryption.exe in RVTools 4.5.0 and above.

**NOTE:** Stored command line scripts will need to be updated with re-encrypted passwords to successfully execute.

Steps to re-encrypt passwords:

1. Use PowerShell script "RVToolsPasswordEncryption.ps1" included in RVTools program file directory.
  - a. PS C:/Program Files (x86)/Dell/RVTools> ./RVToolsPasswordEncryption.ps1
  - b. At prompt: "Please enter your password:" enter the password. This will appear as asterisks. Press the Enter key.
  - c. Program will return encrypted password.
2. Replace any stored passwords with encrypted password generated in step 1



## Scheduled task instructions

The following are example instructions for setting up a scheduled job to run RVTools using Windows Task Scheduler. These steps may be adjusted to suit your specific needs.

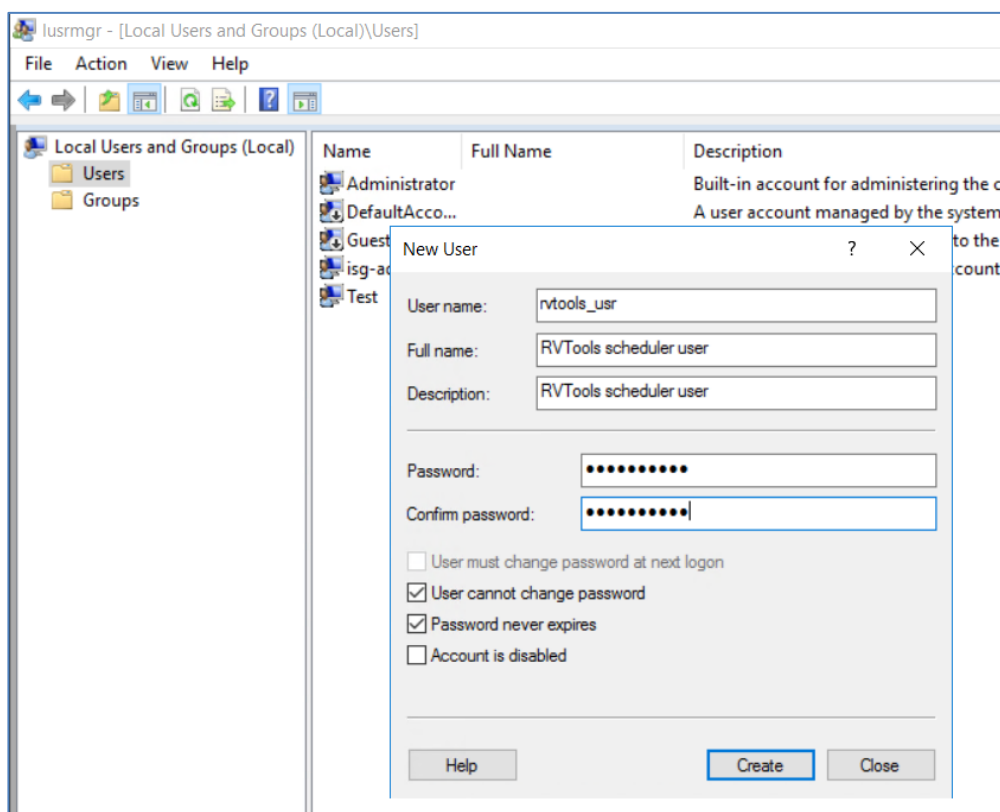
With password encryption, the user running the command line scripts or scheduled jobs must match the user who encrypted the target vCenter server or ESXi host passwords.

To ensure this, follow these basic steps:

- 1) create a user account specifically for running the batch jobs
- 2) assign the applicable permissions
- 3) as the created user, encrypt the necessary passwords using "RVToolsPasswordEncryption.ps1"
- 4) create desired batch script(s) inserting the encrypted password(s) into the Batch scripts (or RVTools -p argument)
- 5) create the scheduled collection job to be run by the created user

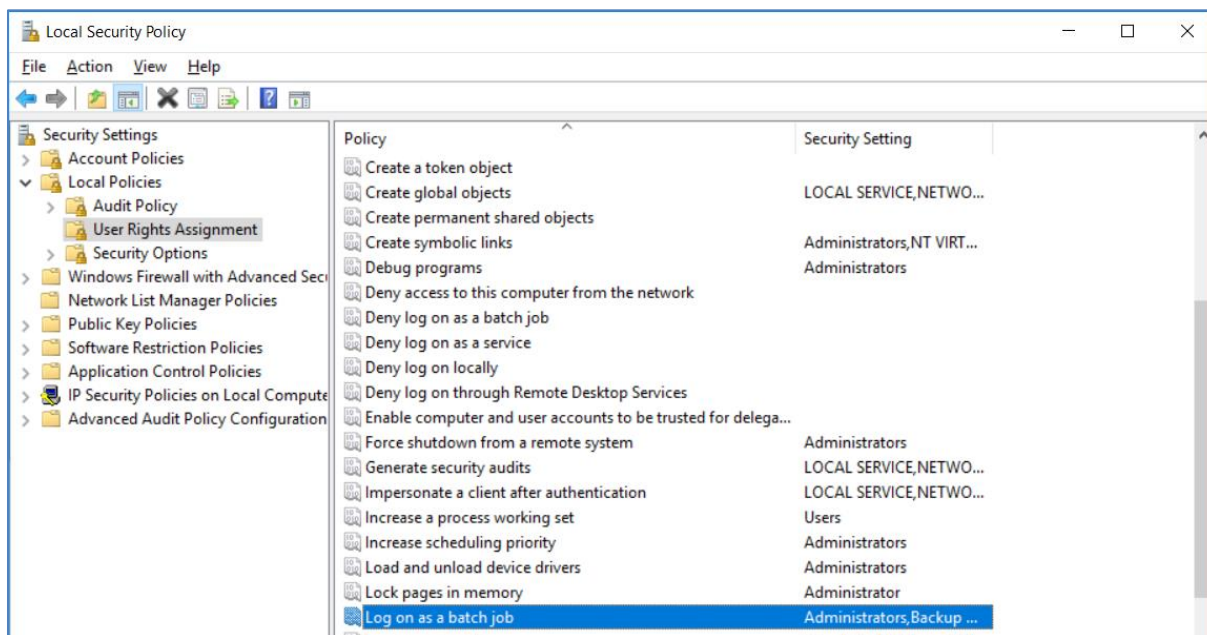
### 1. Create local user on your local machine

- a. Enter "lusrmgr.msc" in Windows search, run as administrator
- b. Enter User name – Note: "rvtools\_usr" is used throughout example



### 2. Set access right policy to enable new local user account to run scheduled tasks

- a. Enter "secpol.msc" in Windows search, run as administrator
- b. Select "User Rights Assignment" under Security Settings/Local Policies
- c. Select policy "Log on as a batch job" and add new local user account



3. Encrypt passwords for each target
  - a. From command prompt, run the following command:  
`runas /user:rvtools_usr powershell`
  - b. When prompted, enter password for newly created user account
  - c. In PowerShell window, change to the RVTools installation folder (typically C:\Program Files (x86)\Dell\RVTools)
  - d. Run the password encryption tool "RVToolsPasswordEncryption.ps1" for each password that needs to be encrypted
  - e. Copy the encrypted password (starts with \_RVToolsV3PWD...)

```

powershell (running as WS2016-HV\rvtools_usr)
Windows PowerShell
Copyright (C) 2016 Microsoft Corporation. All rights reserved.

PS C:\Windows\system32> cd 'C:\Program Files (x86)\Dell\RVTools\'
PS C:\Program Files (x86)\Dell\RVTools> .\RVToolsPasswordEncryption.ps1
Please enter your password: *****
_RVToolsV3PWD01000000d08c9ddf0115d1118c7a00c04fc297eb010000005a9cd0c3ebc4744ab8afa310b1ac
0000100002000000e179e72a17e344b2c4b3d648140007b540b3f9760a2c21f4b1a5b72ba32d7f7a0000000
d3642dbceb90a0be24ebaa7bdc97f60d38ae4bfdc6efa8c6e7c0d7490300000003a78c4a2344693c5041763b9
2a6c61cb05d78ce6fada13b7575659a7a9769332c40000000536e5781a54bd7fe1c7a08c0744931dfd5a36286
62675ac8f0d19aab59ee06f88e41f893e2085b1d910408b6de235f9e1
PS C:\Program Files (x86)\Dell\RVTools>
    
```

4. Insert encrypted password(s) into script(s)
  - a. From your preferred text editor (Notepad++, VSCode, etc.), create desired script or use sample script "RVToolsBatchMultipleVCs.ps1" available from RVTools install directory.

- b. Paste encrypted password into script(s) or RVTools -p argument

```

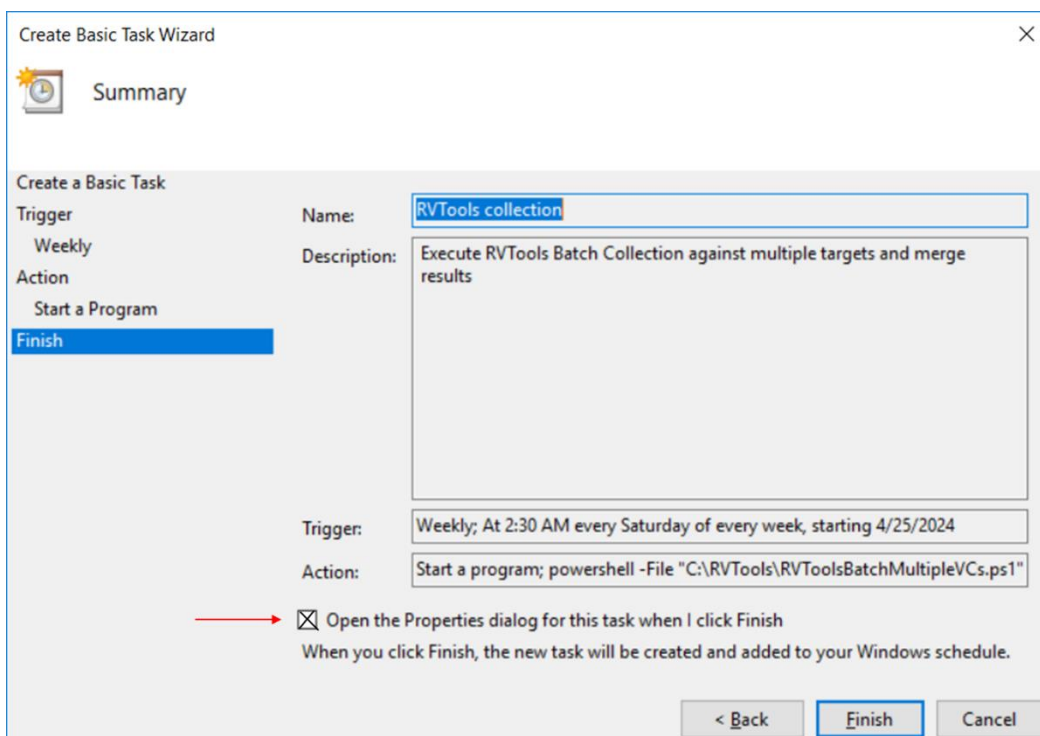
26 # Set RVTools path
27 [string] $RVToolsPath = "C:\Program Files (x86)\Dell\RVTools"
28
29 # cd to RVTools directory
30 set-location $RVToolsPath
31
32
33 # -----
34 # Set parameters for vCenter 1 and start RVTools export
35 # -----
36 [string] $VCServer = "192.168.2.220" # my test vCenter server
37 [string] $User = "vsphere.local\rob"
38
39 # use -passthroughAuth or an encrypted password. You can encrypt your password with the provided PowerShell script RVToolsPs
40 [string] $EncryptedPassword = "RVToolsV3PWD0100000d08c9ddf0115d1118c7a00c04fc297eb01000000325cf1e07062a848a422825c7ccd19f"
41
42 [string] $XlsxDir1 = "C:\RVTools"
43 [string] $XlsxFile1 = "vCenter1.xlsx"
44
45 # Start cli of RVTools
46 Write-Host "Start export for vCenter $VCServer" -ForegroundColor DarkYellow
47 $Arguments = "-u $User -p $EncryptedPassword -s $VCServer -c ExportAll2xlsx -d $XlsxDir1 -f $XlsxFile1"
48
49 Write-Host $Arguments

```

## 5. Set up scheduled job

With Windows Task Scheduler:

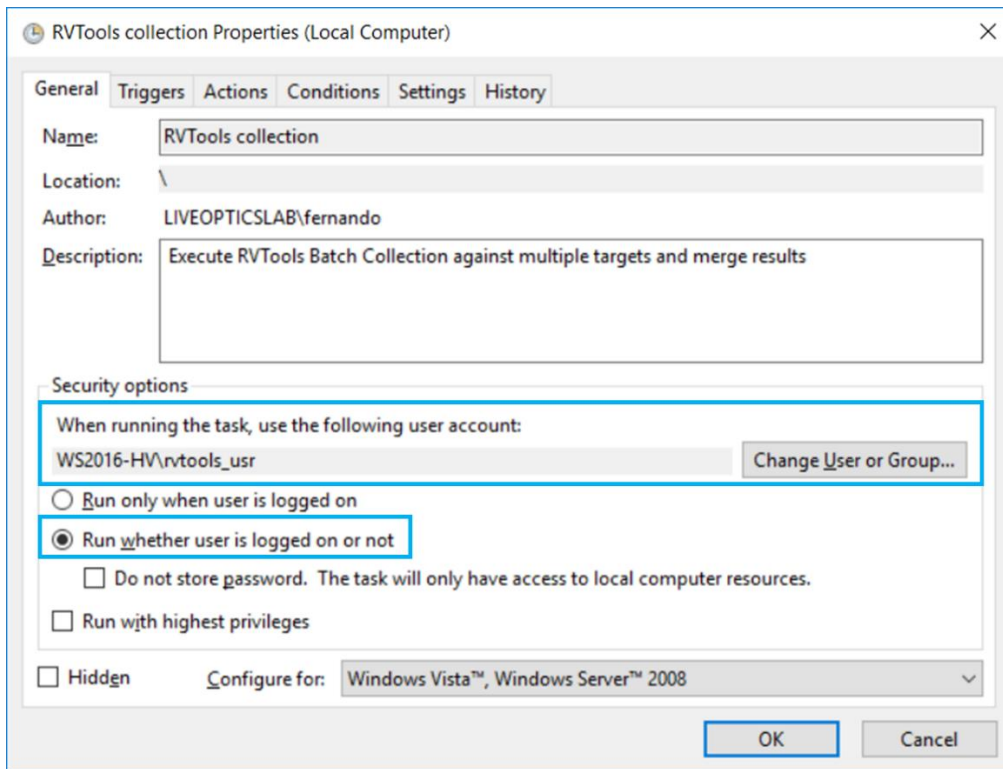
- Create a basic task – example: “RVTools collection”
- Define the Trigger (desired schedule) – example: Weekly; at 2:30 AM every Saturday
- Set the Action to “Start a program” – example: powershell
- Add argument for the script – example: -File "C:\RVTools\RVToolsBatchMultipleVCs.ps1"
- Specify location for Start in – example: C:\Program Files (x86)\Dell\RVTools
- Select option to “Open the properties dialog for this task when I click Finish”



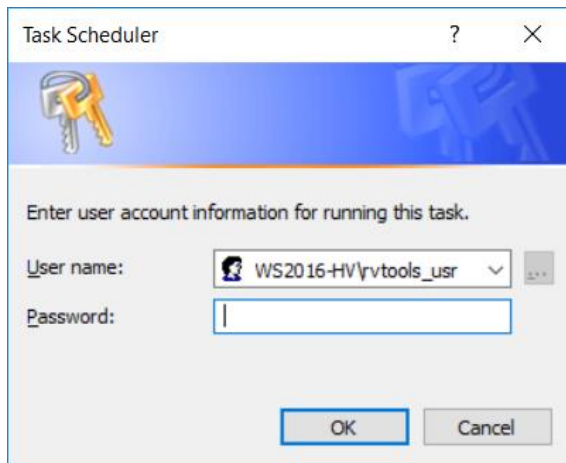
On RVTools collection Properties dialog:

- Select button “Change User or Group” and select new user account (rvtools\_usr)
- Select option to “Run whether user is logged on or not”

- i. Click "OK"



- j. Supply user password for new user account when prompted



Your RVTools collection job is now scheduled.

## Commandline parameters

### Start RVTools with pass-through authentication

Start RVTools, use pass-through authentication, and connect to a specific virtualcenter or ESX server.

```
RVTools -passthroughAuth -s virtualcenter.domain.local
```

```
Example: RVTools -passthroughAuth -s vc5.robware.local
```

### Start RVTools with userid password

Start RVTools, pass userid and encrypted password, and connect to a specific virtualcenter or ESX server.

```
RVTools -u userid -p password -s virtualcenter.domain.local
```

```
Example: RVTools -u Administrator -p password -s 192.168.2.220
```

### Start RVTools with pass-through authentication, and export all to csv

Start RVTools, use pass-through authentication, connect to a specific virtualcenter or ESX server, start export all to csv and write the csv files to the given directory.

```
RVTools -passthroughAuth -s virtualcenter.domain.local -c ExportAll2csv -d directory
```

```
Example: RVTools -passthroughAuth -s vc5.robware.local -c ExportAll2csv -d c:\temp
```

### Start RVTools with userid password, and export all to csv

Start RVTools connect to a specific virtualcenter or ESX server, pass userid and encrypted password, start export all to csv and write the csv files to a specific directory.

```
RVTools -s virtualcenter.domain.local -u userid -p password -c ExportAll2csv -d directory
```

```
Example: RVTools -s 192.168.2.220 -u Administrator -p password -c ExportAll2csv -d c:\temp
```

### Start RVTools with pass-through authentication, and export all to xlsx

Start RVTools, use pass-through authentication, connect to a specific virtualcenter or ESX server, start export all to xlsx and write the xlsx file to the given directory with the given filename.

```
RVTools -passthroughAuth -s virtualcenter.domain.local -c ExportAll2xlsx -d directory -f filename
```

Example:

```
RVTools -passthroughAuth -s vc5.robware.local -c ExportAll2xlsx -d c:\temp -f mytest.xlsx
```

## Start RVTools with userid password, and export all to xlsx

Start RVTools connect to a specific virtualcenter or ESX server, pass userid and encrypted password, start export all to xlsx and write the xlsx files to the given directory with the given filename.

```
RVTools.exe -s virtualcenter.domain.local -u userid -p password -c ExportAll2xlsx -d directory -f filename
```

```
Example: RVTools.exe -s 192.168.2.220 -u Administrator -p password -c ExportAll2xlsx -d c:\temp -f rvtools.xlsx
```

If you don't pass the filename RVTools will create a filename with a timestamp  
RVTools\_export\_all\_yyyymmddhhmmss.

## Start RVTools with userid password, and export a single tab page to xlsx

Since version 3.2 it's possible to export a single tab page to excel.

### vInfo

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvInfo2xlsx -d C:\Temp -f vInfo.xlsx
```

### vCPU

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvCpu2xlsx -d C:\Temp -f vCpu.xlsx
```

### vMemory

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvMemory2xlsx -d C:\Temp -f vMemory.xlsx
```

### vDisk

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvDisk2xlsx -d C:\Temp -f vDisk.xlsx
```

### vPartition

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvPartition2xlsx -d C:\Temp -f vPartition.xlsx
```

### vNetwork

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvNetwork2xlsx -d C:\Temp -f vNetwork.xlsx
```

### vUSB

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvUSB2xlsx -d C:\Temp -f vUSB.xlsx
```

### vCD

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvCD2xlsx -d C:\Temp -f vCD.xlsx
```

### vSnapshot

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvSnapshot2xlsx -d C:\Temp -f vSnapshot.xlsx
```

### vTools

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvTools2xlsx -d C:\Temp -f vTools.xlsx
```

### **vSource**

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvSource2xlsx -d C:\Temp -f vSource.xlsx
```

### **vRP**

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvRP2xlsx -d C:\Temp -f vRP.xlsx
```

### **vCluster**

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvCluster2xlsx -d C:\Temp -f vCluster.xlsx
```

### **vHost**

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvHost2xlsx -d C:\Temp -f vHost.xlsx
```

### **vHBA**

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvHBA2xlsx -d C:\Temp -f vHBA.xlsx
```

### **vNIC**

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvNIC2xlsx -d C:\Temp -f vNIC.xlsx
```

### **vSwitch**

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvSwitch2xlsx -d C:\Temp -f vSwitch.xlsx
```

### **vPort**

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvPort2xlsx -d C:\Temp -f vPort.xlsx
```

### **dvSwitch**

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportdvSwitch2xlsx -d C:\Temp -f dvSwitch.xlsx
```

### **dvPort**

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportdvPort2xlsx -d C:\Temp -f dvPort.xlsx
```

### **vSC+VMK**

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvSC+VMK2xlsx -d C:\Temp -f vSC+VMK.xlsx
```

### **vDatastore**

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvDatastore2xlsx -d C:\Temp -f vDatastore.xlsx
```

### **vMultiPath**

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvMultiPath2xlsx -d C:\Temp -f vMultiPath.xlsx
```

### **vLicense**

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvLicense2xlsx -d C:\Temp -f vLicense.xlsx
```

### **vFileInfo**

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvFileInfo2xlsx -d C:\Temp -f vFileInfo.xlsx
```



### vHealth

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvHealth2xlsx -d C:\Temp -f vHealth.xlsx
```

These commands will also work when you use the `-passthroughAuth` option.

## Start RVTools with userid password, and export a single tab page to csv

Since version 3.7 it's possible to export a single tab page to csv.

### vInfo

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvInfo2csv -d C:\Temp -f vInfo.csv
```

### vCPU

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvCpu2csv -d C:\Temp -f vCpu.csv
```

### vMemory

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvMemory2csv -d C:\Temp -f vMemory.csv
```

### vDisk

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvDisk2csv -d C:\Temp -f vDisk.csv
```

### vPartition

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvPartition2csv -d C:\Temp -f vPartition.csv
```

### vNetwork

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvNetwork2csv -d C:\Temp -f vNetwork.csv
```

### vUSB

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvUSB2csv -d C:\Temp -f vUSB.csv
```

### vCD

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvCD2csv -d C:\Temp -f vCD.csv
```

### vSnapshot

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvSnapshot2csv -d C:\Temp -f vSnapshot.csv
```

### vTools

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvTools2csv -d C:\Temp -f vTools.csv
```

### vSource

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvSource2csv -d C:\Temp -f vSource.csv
```

### vRP

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvRP2csv -d C:\Temp -f vRP.csv
```

### vCluster

```
rvtools -u Administrator -p password -s 192.168.2.220 -c ExportvCluster2csv -d C:\Temp -f vCluster.csv
```



#### **vHost**

```
rvtools -u Administrator -p password -s 192.168.2. 220 -c ExportvHost2csv -d C:\Temp -f vHost.csv
```

#### **vHBA**

```
rvtools -u Administrator -p password -s 192.168.2. 220 -c ExportvHBA2csv -d C:\Temp -f vHBA.csv
```

#### **vNIC**

```
rvtools -u Administrator -p password -s 192.168.2. 220 -c ExportvNIC2csv -d C:\Temp -f vNIC.csv
```

#### **vSwitch**

```
rvtools -u Administrator -p password -s 192.168.2. 220 -c ExportvSwitch2csv -d C:\Temp -f vSwitch.csv
```

#### **vPort**

```
rvtools -u Administrator -p password -s 192.168.2. 220 -c ExportvPort2csv -d C:\Temp -f vPort.csv
```

#### **dvSwitch**

```
rvtools -u Administrator -p password -s 192.168.2. 220 -c ExportdvSwitch2csv -d C:\Temp -f dvSwitch.csv
```

#### **dvPort**

```
rvtools -u Administrator -p password -s 192.168.2. 220 -c ExportdvPort2csv -d C:\Temp -f dvport.csv
```

#### **vSC+VMK**

```
rvtools -u Administrator -p password -s 192.168.2. 220 -c ExportvSC+VMK2csv -d C:\Temp -f vSC+VMK.csv
```

#### **vDatastore**

```
rvtools -u Administrator -p password -s 192.168.2. 220 -c ExportvDatastore2csv -d C:\Temp -f vDatastore.csv
```

#### **vMultiPath**

```
rvtools -u Administrator -p password -s 192.168.2. 220 -c ExportvMultiPath2csv -d C:\Temp -f vMultiPath.csv
```

#### **vLicense**

```
rvtools -u Administrator -p password -s 192.168.2. 220 -c ExportvLicense2csv -d C:\Temp -f vLicense.csv
```

#### **vFileInfo**

```
rvtools -u Administrator -p password -s 192.168.2. 220 -c ExportvFileInfo2csv -d C:\Temp -f vFileInfo.csv
```

#### **vHealth**

```
rvtools -u Administrator -p password -s 192.168.2. 220 -c ExportvHealth2csv -d C:\Temp -f vHealth.csv
```

These commands will also work when you use the `-passthroughAuth` option.

## Commandline switches

### -ExcludeCustomAnnotations

When this switch is passed to the CLI the custom annotation fields are not exported.

### -ExcludeTags

When this switch is passed to the CLI the tag fields are not exported.

### -DBCcolumnNames

When this switch is passed to the CLI the column names are not the display column names but the RVTools internally column names. This can be used if the RVTools data will be uploaded into a database management system.

### -GetFriendlyNames

When this switch is passed to the CLI, RVTools will wait until "Get Friendly vSan Names" thread is finished. This makes sense if you are using a vSAN and you want to see the friendly vSAN name instead of the UUIDs.

### -GetFileInfo

When this switch is passed to the CLI, RVTools will populate the vFileInfo tab page.  
Warning: This can take a very long time!

## Powershell batch example

Since version 3.10 there is an example PowerShell file deployed in the RVTools program file directory. With this example script you can start the the RVTools export all to xlsx function for multiple vCenter servers. The output xlsx files will be merged to one xlsx file which will be mailed.

```
#
=====
# Script:    RVToolsBatchMultipleVCs.ps1
# Version:   1.4
# Date:      November, 2023
# By:        Dell Technologies
#
=====

<#
.SYNOPSIS
With this example script you can start the the RVTools export all to xlsx
function for multiple vCenter servers.
The output xlsx files will be merged to one xlsx file which will be mailed

.DESCRIPTION
With this example script you can start the the RVTools export all to xlsx
function for multiple vCenter servers.
The output xlsx files will be merged to one xlsx file which will be mailed

.EXAMPLE
.\RVToolsBatchMultipleVCs.ps1
#>
```

## RVToolsMergeExcelFiles

Since version 3.11 there is a new executable available in the RVTools program directory. This new executable is a replacement for the Powershell merge xlsx files script. With RVToolsMergeExcelFiles it's possible to merge multiple RVTools ExportAll files. It's not needed that Excel is installed on the machine where this program has to run.

### USAGE

```
RVToolsMergeExcelFiles.exe -input file_a;file_b -output file_c  
[-template file_d] [-overwrite] [-verbose]
```

-input	full path to input xlsx file(s)
-output	full path to output xlsx file
-template	full path to template xlsx file
-overwrite	overwrite output file if it exists
-verbose	display informational messages

The first input file is leading which means that only the worksheets and columns which are available in the first input file are filled with the data from the second input file.

An example: first input file is a vInfo worksheet with annotation columns aa, bb and cc. The second input file is a vInfo worksheet with annotation columns bb, cc and dd. Only the annotation columns bb and cc are merged. Column dd is skipped.

### Templatefile

You can use a template file if you only want a subset of worksheet and/or columns. Copy an exportall xlsx file to a template file and remove all data! Remove the worksheet and columns from the template file which you don't want to see in the output file.

An example: You have to share your RVTools exportall information with an external party but you don't want to share your VMware license information. Edit your template file, remove the vLicense worksheet and remove the assigned license column in the vHost worksheet.

An example: if your first input file has annotation fields aa, bb and cc and your second input file has annotation fields bb, cc and dd and you want to see all annotation columns in the output file you have to create a template file with annotation columns aa, bb, cc and dd.

## Log4net properties

Since version 3.4 it's possible to write debug information to a log file. By default debugging is enabled and set to `<level value="INFO" />`. Changing it to `<level value="DEBUG" />` will enable additional troubleshooting logging. Note when enabled at DEBUG level, it will have a performance penalty.

The log4net.properties file can be found in the RVTools application directory.

```
<?xml version="1.0"?>
<log4net>
  <appender name="RollingLogFileAppender" type="log4net.Appender.RollingFileAppender">
    <param name="File" value="{LOCALAPPDATA}/RVTools/RVTools.log"/>
    <param name="AppendToFile" value="true" />
    <rollingStyle value="Size" />
    <maxSizeRollBackups value="5" />
    <maximumFileSize value="10MB" />
    <countDirection value="1"/>

    <layout type="log4net.Layout.PatternLayout">
      <param name="ConversionPattern" value="%d %-5p %c %m%n" />
    </layout>
  </appender>

  <root>
    <level value="INFO" />
    <appender-ref ref="RollingLogFileAppender" />
  </root>
</log4net>
```

More information about log4net can be found on: <http://logging.apache.org/log4net/>

## Version information

### Version 4.7.1 (October 3, 2024)

- FIXED:
  - Issue deserializing data on systems with VMs requiring consolidation.
  - Issue reporting vCLS appliances folder names as inconsistent.
  - Issue reporting Site Recovery Manager Placeholder VM's folder names as inconsistent.
  - Issue with RVTools crashing on systems with FIPS enabled.
  - Issue with numeric string values being converted to scientific notation in Excel.
  - Issue with occasional password decryption failures.
  
- UPDATED:
  - Upgraded RVTools solution to use VMware vSphere Management SDK 8u3
  - Upgraded Target .Net Framework to 4.7.2
  - Upgraded RVTools Social Media link.

### Version 4.6.1 (May 14, 2024)

- FIXED:
  - Issue requiring working directory to be set to RVTools installation directory when using command line scripting.
  - Issue occurring when a leading or trailing space was included as a result of copying/pasting Hostname or Username.
  - Condition where background errors prevented RVTools from completing successfully in a non-interactive mode as a scheduled job.
  - Error logging is now enabled by default to facilitate faster troubleshooting. Manually changing to debug level will now only be requested for situations requiring more detailed troubleshooting information. NOTE: Default location of log files has been moved to the user's AppData/Local/RVTools folder.
  - Issue with values containing double quotes corrupting csv files.
  
- ADDED:
  - Optional Product Improvement Program to gather minimal anonymous telemetry data for use in optimizing the user interface and effectiveness of RVTools. See additional information on RVTools website [About page](#).
  - On vHost tab page new columns: Compliance Check State, Domain List, Memory Tiering Type
  - On vHost tab page new Certificate columns: Certificate Issuer, Certificate Start, Certificate Expiry, Certificate Status, Certificate Subject

- On vInfo tab page new columns: Suspended To Memory, Suspend Interval
- On vInfo tab page new columns: Overall Cpu Readiness, Active Memory, Fixed Passthru Hot Plug, Op Notification Timeout, VM Failover In Progress
- On vInfo tab page new Customization Info column
- On vInfo tab page new Guest Detailed Data column which includes - architecture, bitness, buildNumber, cpeString, distroName, distroVersion, familyName, kernelVersion, prettyName
- On vHealth tab page: Added warning "Certificate within XX days of expiring or has expired." (configurable XX days)
- Health Properties: New checkbox to enable/disable certificate expiration warning and configure desired timeframe. (default = 90 days)
- UPDATED:
  - Upgraded RVTools solution to use VMware vSphere Management SDK 8u2
  - Deserialize error section to include example PowerShell script for identifying VMs causing error, and instructions on using sample script (now also provided in installer).
  - Product Documentation for new columns
  - Product Documentation to include recommended steps to run RVTools with Windows scheduler to avoid password encryption issues

### Version 4.5.1 (November 29, 2023)

- FIXED:
  - Fixed an issue with the 4.5.0 build which limits the memory usage of the utility to a maximum of 3GB. This may cause the utility to unexpectedly fail. If you downloaded version 4.5.0, we recommend upgrading to 4.5.1.

### Version 4.5.0 (November 23, 2023)

- FIXED:
  - CVE-2023-44303 and CVE-2020-27688

Note: as part of this fix, the RVToolsPasswordEncryption utility will no longer be available. Alternatively, we are supplying a PowerShell script to encrypt passwords. The script uses Windows Data Protection API to encrypt your password. Users will need to re-encrypt their passwords using the RVToolsPasswordEncryption.ps1.

Please check chapter "Password encryption" in the RVTools documentation.

- ADDED:
  - New RVToolsPasswordEncryption.ps1 script.
- UPDATED:
  - RVToolsBatchMultipleVCs.ps1 example script.
  - Product Documentation
- REMOVED:
  - RVToolsPasswordEncryption utility
  - Support for plain-text passwords when RVTools is executed via CLI or Scheduled Task

- Support for older encrypted password values

#### Version 4.4.5 (October 18, 2023)

- Change in Author, Company, and Copyright to Dell Technologies.
- Contact email id update from [rvtools@robware.net](mailto:rvtools@robware.net) to [rvtools@dell.com](mailto:rvtools@dell.com).
- Change in default installation path from **C:\Program Files (x86)\Robware\RVTools** to **C:\Program Files (x86)\Dell\RVTools**.

#### Version 4.4.4 (October 5, 2023)

- Adjustment of license conditions.

#### Version 4.4.3 (June 23, 2023)

- Fix for "This digital signature is not valid" problem with msi file.

#### Version 4.4.2 (May 25, 2023)

- Bug fix for "Salt is not at least eight bytes" exception in RVToolsPasswordEncryption.
- Bug fix for System.OutOfMemoryException exception in RVToolsMergeExcelFiles.
- Bug fix msi installer did not update all necessary files in the installation directory.

#### Version 4.4.1 (February 11, 2023)

- Upgraded RVTools solution to Visual Studio 2022
- Upgraded RVTools solution to use VMware vSphere Management SDK 8.0
- Log4net upgraded to version 2.0.15
- RVToolsPasswordEncryption now uses the mac address instead of a fixed string to encrypt the password.
- On vInfo tab page new columns: Total Disk capacity in MiB, Folder ID, Fault tolerance role, Reboot poweroff, EFI Secure boot option, and SMBIOS UUID
- On vCPU tab new column: "Numa Hotadd Exposed" boolean value if virtual NUMA topology is exposed when CPU hotadd is enabled
- On vDisk tab page new columns: Disk UUID, Disk sharing mode
- On all related VM tab pages the tag columns are moved just before the Datacenter column
- On all VM related tab pages: Changed the VM UUID tooltip text to "VirtualCenter-specific 128-bit UUID of a virtual machine"
- On vSource tab page new columns: version, patch level and VI SDK Server
- On vHealth tab page: /storage/archive is excluded for the "free disk capacity" check as the /storage/archive partition can be full by design.  
<https://kb.vmware.com/s/article/57829>
- Bug fix on vInfo tab page: Column "Primary IP Address" didn't show correct value
- Bug fix on vNetwork tab page: determining whether an ip address was an ipv4 or ipv6 did not always go well

#### Version 4.3.2 (November 5, 2022)

- Using .NET Framework 4.6.2 for all RVTools executables instead of 4.6.1 which is no longer supported.



- Using Newtonsoft.Json version 13.0.1 instead of 12.0.3. which has a high severity vulnerability.
- Bug fix: Connection timeout issue for huge vSphere environments.
- Bug fix: Changed Platform target for RVToolsMergeExcelFiles to "Any CPU" so that it can use the X64 platform and thus avoid System.OutOfMemoryException exceptions for huge vSphere environments.
- Bug fix: Removed debug output lines from RVToolsMergeExcelFiles.

### Version 4.3.1 (February 5, 2022)

- Upgraded RVTools solution to use VMware vSphere Management SDK 7.0U3
- New tab page: The "vSource" tab page displays information about the server where the SDK web service is running which is used by RVTools to gather all data. This is your vCenter server or ESX host.
- On vHost tab page new column: Host UUID.
- Health properties: New checkbox to enable or disable security health messages.
- On all related VM tab pages the column UUID was filled with the SMBIOS UUID value which is not unique. Now the column is filled with the unique VirtualCenter-specific 128-bit UUID value.
- The performance specialist Henk van der Valk (Henk@fulldata.nl) gave me two performance tips for VMs that I could incorporate into RVTools. And of course I did. Thanks Henk!
- On vHealth tab page: new disk I/O and in-memory performance tips.
- Health properties: New checkbox to enable or disable performance tips health messages.
- Bug fix: on vInfo tab page the value of Video RAM was not visible.
- Bug fix: RVToolsMergeExcelFiles when one of the xlsx files contains no VMs an extra header row was added in the merged xlsx.

### Version 4.2.2 (December 29, 2021)

- Bug fix: HA Information was not displayed on the vInfo and vCluster tab pages
- Bug fix: Cluster rules were not displayed on vInfo tab page
- Bug fix: The default name for new vCLS VMs deployed in vSphere 7.0 Update 3 environment uses a new pattern vCLS-UUID. These VCLS files are now no longer marked as possible zombies.

### Version 4.2.1 (December 4, 2021)

- Bug fix: On vHealth tab page, vSphere Cluster Services (vCLS) vmx and vmdk files or no longer marked like possible zombie files.
- RVToolsMergeExcelFiles: Bug fixes and improved performance.

### Version 4.1.4 (June 14, 2021)

- Bug Fix: For a unhandled exception when a connection is made to an ESXi 7.0.2 host.

### Version 4.1.3 (April 11, 2021)

- Bug Fix: RVToolsMergeExcelFiles.exe could not load file or assembly.

### Version 4.1.2 (April 5, 2021)

- RVTools msi is now signed with a Sectigo certificate
- Log4net is upgraded to version 2.0.12 (as fix for CVE-2018-1285)

- New vUSB tab page: VM's with a connected Host USB device are displayed.
- vFloppy tab page is removed
- Preference extra checkbox for "Wait for Get Friendly vSAN Names thread at startup". By default this setting is disabled. If enabled RVTools will first collect the friendly names of the vSAN folders. Friendly vSAN names are displayed, instead of guid, on vInfo, vDisk and vSnapshot tab pages.
- New CLI switch: -GetFriendlyNames if set RVTools CLI will first collect the friendly names of the vSAN folders
- New experimental tab page vFileInfo with details of all files found on all datastores
- Preference extra checkbox for "Get fileinfo detail information". By default this setting is disabled. If enabled RVTools will collect all details of all files on all datastores. Warning this is very time consuming!
- New CLI switch: -GetFileInfo if set RVTools CLI will populate the vFileInfo tab page.
- On Logon screen the build number is now also part of the displayed version number
- All relevant VM tab pages now have a new column indicating if it is an SRM placeholder.
- On Filter form it's now possible to filter on SRM placeholders
- On vInfo tab now up to eight network cards are displayed (was four)
- On vNetwork tab page new column: NIC label showing the order number of the NIC
- On vNetwork tab page: IP column split into ipv4 and ipv6 columns
- On vDisk tab page new columns: Disk key and disk path = Name of the virtual disk in the guest operating system.  
For example: C:\ (only works for vSphere >= 7.0)
- On vDisk tab page new column: "Internal Sort Column" is used internally for sorting the vDisk data on VM name and disk key
- On vPartition tab page new column: "Internal Sort Column" is used internally for sorting the vPartition data on VM name and disk key
- On vPartition tab page new column: Disk key can be used to map vDisk disk with disk partition
- On vNetwork tab page new column: "Internal Sort Column" is used internally for sorting the vNetwork data on VM name and NIC name
- On vHealth tab page the vSAN folder names are now displayed with their friendly folder names. Instead of guid
- On vRP tab page new column: Resource Pool path
- On vRP tab page new column: Total number of VM's in resource pool.
- On vHost tab page new column: Total number of VM's on host.
- On vHost tab page new column: vSAN Fault Domain Name
- On vDatastore tab page new column: Total number of VM's on datastore.
- On vHealth tab page: new security message if "ESXi Shell" or "SSH" service is running on a host.
- All column labels containing MB have been adjusted to MiB because there is some confusion about this.
- RVTools will display a warning message if not all VM inventory is collected. There seems to be an XML deserialize issue when there is a VM with hundreds of disks. The problem seems to be mainly caused by backup solutions that cannot clean everything properly when the backup is finished. Instruction is included in the documentation on how to find the "bad" VM.
- Bug Fix: On vHealth tab page "Inconsistent Foldername" check is changed. For vSAN folders the friendly name of a folder is now compared with the VM name.
- Bug Fix: \*-digest.vmdk files are excluded for zombie checks
- Bug Fix: Total size of snapshot files.

### Version 4.0.7 (December 19, 2020)

- Bug fix: vSphere 7.0d, "Unhandled exception: Input string was not in a correct format."

### Version 4.0.6 (August 29, 2020)

- Bug Fix: in some situations the distributed switch information in vNetwork tab page was not displayed
- Bug Fix: Not all snapshot child's were displayed

### Version 4.0.4 (May 1, 2020)

- Upgraded RVTools solution to use VMware vSphere Management SDK 7.0
  - Upgraded RVTools solution to use CIS REST API, available since vSphere 6.5, to get tag information
  - vInfo tab page new columns: Virtual machine tags and min Required EVC Mode Key
  - vCPU tab page new columns: Virtual machine tags
  - vMemory tab page new columns: Virtual machine tags and Memory Reservation Locked To Max
  - vDisk tab page new columns: Virtual machine tags
  - vPartition tab page new columns: Virtual machine tags
  - vCD tab page new columns: Virtual machine tags
  - vFloppy tab page new columns: Virtual machine tags
  - vNetwork tab page new columns: Virtual machine tags
  - vSnapshot tab page new columns: Virtual machine tags
  - vTools tab page new columns: Virtual machine tags
  - vRP tab page new columns: Resource Pool tags and object ID
  - vCluster tab page new columns: Cluster tags, custom attributes and object ID
  - vHost tab page new columns: Host tags, in Maintenance Mode and in Quarantine Mode
  - dvSwitch tab page new columns: Distributed VirtualSwitch tags, custom attributes and object ID
  - dvPort tab page new columns: Distributed VirtualSwitch Port Group tags and object ID
  - vDatastore tab page new columns: Datastore tags, custom attributes and object ID
  - Preference extra checkbox for "Exclude tags"
  - CLI new parameter -ExcludeTags
  - Bug fix: removed column "Config Checksum" from vInfo tab page. This Base64Binary field was sometimes the cause for a XML deserialize error!
  - Bug fix: not all snapshots from all snapshot siblings were displayed
  - Bug fix: preference setting "Exclude Annotation fields" value was overwritten.
  - Bug fix: Name on vRP tab page was full path
  - Bug fix: In example RVToolsBatchMultipleVCs.ps1 script parameters changed for RVToolsMergeExcelFiles.exe
  - Bug fix: vSphere 7, "Unhandled exception: Input string was not in a correct format."
- 
- Known issue: Tags are only visible when logged on with userid/password. It's not working when SSO is used!

### Version 3.11.9 (May 26, 2019)

- Bug Fix: Web service call, send and receive timeout value increased. I solved this problem with help from Chris Apostolof. Thanks again Chris for helping me to find a solution for this nasty bug.

### Version 3.11.8 (May 10, 2019)

- Bug Fix: in some situation not all NIC information was displayed in the vNic tab page.

### Version 3.11.7 (March 15, 2019)

- Bug Fix: in some circumstances a "host not found" message when host name is an IP address.

### Version 3.11.6 (March 9, 2019)

- Upgraded RVTools solution to use VMware vSphere Management SDK 6.7U1
- Windows Authentication Framework (Waffle) is no longer used by RVTools
- NPOI .NET library for creating excel export files is no longer used by RVTools
- RVTools now uses OpenXML and ClosedXML for creating the excel export files
- Performance improvements for export to excel
- Added -ExcludeCustomAnnotations switch to RVTools command line interface
- Added -DBCcolumnNames switch to RVTools command line interface
- vInfo tab page new column: Creation date virtual machine
- vInfo tab page new columns: Primary IP Address and vmx Config Checksum
- vInfo tab page new columns: log directory, snapshot directory and suspend directory
- dvSwitch tab page new columns: LACP name, LACP mode and LACP loadbalance Algorithm
- vNIC tab page new column: Name of uplink port
- vNetwork tab page new column: Network Adapter DirectPath I/O Parameter
- vHost tab page new columns: Serial number and BIOS vendor
- Header row and first column in export Excel file are now locked.
- First "Select" column is removed from excel worksheet vFloppy, vCD and vTools.
- added a new executable to merge your vCenter xlsx files super-fast to one xlsx file.  
RVToolsMergeExcelFiles.exe -input c:\temp\AA.xlsx;c:\temp\BB.xlsx -output c:\temp\AABB.xlsx -template c:\temp\mytemplate.xlsx -verbose -overwrite
- Example script RVToolsBatchMultipleVCs.ps1 is changed. It will now uses RVToolsMergeExcelFiles to merge the xlsx files.
- Bug Fix: a Single Sign On problem solved
- Bug Fix: ExportvSC+VMK2csv command was not working
- Bug Fix: ExportdvPort2csv command was not working
- Bug Fix: On vNIC tab page not all Switch/dvSwitch information was displayed
- Bug Fix: Export now reflect value of "Latency Sensitivity" enumeration
- Bug Fix: After changing the preference settings the data is not always refreshed as needed
- Bug fix: Content Libraries vmdk files are no longer reported as possible zombie files

### Version 3.10.2 (June, 2018)

- Bug Fix: vNic tab page sometimes not all switches/dvSwitches were displayed

### Version 3.10 (February, 2018)

- Upgraded RVTools solution to Visual Studio 2017
- Upgraded RVTools to .Net Framework version 4.6.1

- Upgraded Log4net to version 2.0.8, Waffle.AD to version 1.8.3 and NPOI to version 2.3.0
- Connection error when TLSv1.0 and TLSv1.1 are disabled and only TLSv1.2 is enabled is solved by using .Net Framework 4.6.1
- vInfo tab page new columns: The latency-sensitivity setting of the virtual machine, Change Block Tracking (CBT) and disk.EnableUUID values
- vDisk tab page new columns: SCSI label, unit number and sharedBus
- vHost tab page new columns: Assigned License(s), ATS heartbeat, ATS locking values. 0 = disabled 1 = enabled, Host Power Policy shortname, CPU Power Management current policy and CPU power hardware support
- When Export to xlsx is executed a metadata worksheet with version number of RVTools and date time stamp is added to the output xlsx file
- All columns in the RVTools export xlsx file(s) now have a filter
- When export to csv newline characters are replaced by spaces
- When started from cli and login fails an error message and login box was displayed. Now RVTools will exit with exit code -1, without showing the error message and login form.
- Added an example PowerShell script with which you can merge RVTools export xlsx files
- Added a example PowerShell script to start Export all to xlsx for multiple vCenters
- vDatastore tab page: For NFS datastores the address column is now filled with remote host and path info
- vDatastore tab page new columns: Datastore Cluster Name, Cluster capacity and Cluster free space
- The upper limit on the Health check for number of VMs on a datastore is now 9999
- vHealth tab page: new column "message type" which can be used as a filter in Excel
- vHealth tab page: hbrdisk.RDID files are no longer reported as possible zombie files
- vHealth tab page: low disk space messages no also show the free space in MB.
- All tab pages: Refresh or auto-refresh will respect your sort order
- CLI export2xls parameters changed to export2xlsx (old parameter will still work)
- Bug Fix: invalid "Horizontal Alignment" value in xlsx style sheet.
- Bug Fix: Calculation of total snapshot size was not always correct
- Bug Fix: Child snapshot hierarchy was not always correct
- Default installation directory is changed to C:\Program Files (x86)\RobWare\RVTools without the version number

### Version 3.9.5 (April, 2017)

- Bug fix: Unhandled System.Security.SecurityException in CLI
- Bug fix: Export vLicense tab page not working in CLI
- Bug fix: Export from CLI creates tabpage.xls.xlsx files. Now changed to tabpage.xlsx files
- Bug fix: dvSwitch tab has two 'Name' fields. One is renamed now

### Version 3.9.3 (March, 2017)

- Bugfix: unhandled exception in decrypt function

### Version 3.9 (February, 2017)

- Migrated RVTools to use .NET Framework version 4
- Migrated RVTools to use NPOI 2.1.3.1
- Support for vSphere 6.5
- Improved logon performance
- RVTools will no longer write messages to the Windows event log
- All VM related tab pages now have a new column: OS according to the VMware Tools
- All tab pages now have a new column: VI SDK Server
- All tab pages column vCenter UUID renamed to VI SDK UUID
- vInfo tab page: new column VI SDK API version
- Export to Excel will now use xlsx format
- Export to Excel all columns are now auto sized
- Excel worksheet names will use same name as the tab page names
- Annotations fields can now be excluded! See preference window
- vPartition tab page new column: Consumed MB
- vHealth \_replica directories are excluded for zombie checks
- \*\_sesparse.vmdk files are excluded for zombie checks
- New tab page with license information
- New PasswordEncryption application added with which you can encrypt your password
- RVTools command line interface accepts now encrypted passwords
- Bug fix: URL Link to online version info issue solved.

### Version 3.8.6 (July, 2016)

- Bug Fix: Unhandled exceptions on vInfo tab page are now handled

### Version 3.8 (March, 2016)

- VI SDK reference changed from 5.5 to 6.0
- On vInfo tab page new field: ChangeVersion unique identifier for a given version of the configuration
- On vInfo tab page new field: HA VM Monitoring status
- On vInfo tab page new fields: Number of supported monitors and Video RAM in KB.
- On vInfo tab page new field: Config status.  
VM config issues are visible on the vHealth tab page
- On vInfo tab page new field: OS according to the VMware Tools
- On vTools tab page new fields: App state, App heartbeat status and Kernel crash state
- On vTools tab page new fields: Operations availability, State change support and Interactive Guest Operations availability
- On vHost tab page new field: NTPD running state.  
NTP issues are visible on the vHealth tab page
- On vHost tab page new field: Config status.  
Host config issues are visible on the vHealth tab page
- On vCluster tab page new field: Config status.  
Cluster config issues are visible on the vHealth tab page
- On vDatastore tab page new field: Config status.  
Datastore config issues are visible on the vHealth tab page



- On vSC+VMK tab page new fields: IP 6 Address and IP 6 Gateway
- All VM related tab pages now have a VM Object ID and VM UUID columns
- All VM related tab pages now have powerstate and template columns
- All tab pages. Now have a vCenter UUID column (= unique identifier for a vCenter Server)
- All VM related tab pages. The Custom Attributes columns are now ordered alphabetically
- All tab pages. A select is now a full row select so it is easier to follow the information across many columns
- Bug fix: Refresh data issue on vRP and vCluster tab pages solved
- Bug fix: Filter issue on vCluster tab page solved
- Bug fix: On vInfo tab page the HA information was not filled with cluster default values
- Bug fix: Content Libraries vmdk files are no longer reported as possible zombie files
- Bug fix: msi installer sometimes installs RVTools in root of c:\ drive. This is solved now.

### Version 3.7 (March, 2015)

- VI SDK reference changed from 5.0 to 5.5
- Extended the timeout value from 10 to 20 minutes for really big environments
- New field VM Folder on vCPU, vMemory, vDisk, vPartition, vNetwork, vFloppy, vCD, vSnapshot and vTools tab pages
- On vDisk tab page new Storage IO Allocation Information
- On vHost tab page new fields: service tag (serial #) and OEM specific string
- On vNic tab page new field: Name of (distributed) virtual switch
- On vMultipath tab page added multipath info for path 5, 6, 7 and 8
- On vHealth tab page new health check: Multipath operational state
- On vHealth tab page new health check: Virtual machine consolidation needed check
- On vInfo tab page new fields: boot options, firmware and Scheduled Hardware Upgrade Info
- On statusbar last refresh date time stamp
- On vHealth tab page: Search datastore errors are now visible as health messages
- You can now export the csv files separately from the command line interface (just like the xls export)
- You can now set an auto refresh data interval in the preferences dialog box
- All datetime columns are now formatted as yyyy/mm/dd hh:mm:ss
- The export dir / filenames now have a formatted datetime stamp yyyy-mm-dd\_hh:mm:ss
- Bug fix: on dvPort tab page not all networks are displayed
- Overall improved debug information

### Version 3.6 (February, 2014)

- New tab page with cluster information
- New tab page with multipath information
- On vInfo tab page new fields HA Isolation response and HA restart priority
- On vInfo tab page new fields Cluster affinity rule information
- On vInfo tab page new fields connection state and suspend time

- On vInfo tab page new field The vSphere HA protection state for a virtual machine (DAS Protection)
- On vInfo tab page new field quest state.
- On vCPU tab page new fields Hot Add and Hot Remove information
- On vCPU tab page cpu/socket/cores information adapted
- On vHost tab page new fields VMotion support and storage VMotion support
- On vMemory tab page new field Hot Add
- On vNetwork tab page new field VM folder.
- On vSC\_VMK tab page new field MTU
- RVToolsSendMail: you can now also set the mail subject
- Fixed a datastore bug for ESX version 3.5
- Fixed a vmFolder bug when started from the commandline
- Improved documentation for the commandline options

### Version 3.5 (March, 2013)

- On vInfo tab page new field: Resource pool
- On vInfo tab page new field: Consolidation needed.
- On vCPU tab page new field: Number of cores per socket
- New tab page with resource pool information
- On vNetwork tab page new column: Switch name
- On vNetwork tab page new column: Starts Connected
- On vTools tab page new column: required version
- On vHost tab page new columns: custom fields
- On vDisk tab page new columns: raw disk information
- Improved error handling for SSO login problems
- Bug fix: Invalid snapshot size fixed
- Bug fix: All datetime fields now use the local time zone
- Bug fix: data not refreshed after changing filter

### Version 3.4 (September, 2012)

- Overall performance improvements and better end user experience
- VI SDK reference changed from 4.0 to 5.0
- Added reference to Log4net (Apache Logging Framework) for debugging purpose
- Fixed a SSO problem
- CSV export trailing separator removed to fix PowerShell read problem
- On vDisk tab page new fields: Eagerly Scrub and Write Through
- On vHost tab page new field: vRAM = total amount of virtual RAM allocated to all running VMs
- On vHost tab page new fields: Used memory by VMs, Swapped memory by VMs and Ballooned memory by VMs
- Bugfix: Snapshot size was displayed as zero when smaller than 1 MB
- Added a new preferences screen. Here you can disable / enable some performance killers. By default they are disabled

### Version 3.3 (April, 2012)

- GetWebResponse timeout value changed from 5 minutes to 10 minutes (for very big environments)
- New tab page with HBA information



- On vDatastore tab the definition of the Provisioned MB and In Use MB columns was confusing! This is changed now.
- RVToolsSendMail accepts now multiple recipients (semicolon is used as separator)
- Folder information of VMs and Templates are now visible on vInfo tab page
- Bugfix: data in comboboxes on filter form are now sorted
- Bugfix: Problem with api version 2.5.0 solved
- Bugfix: Improved exception handling on vCPU tab.
- Bugfix: Improved exception handling on vDatastore tab.

### Version 3.2 (October, 2011)

- New tab page with distributed switch information
- New tab page with distributed port information
- It's now possible to export a single tab page to an excel file from the command line.
- It's now possible to save the filter. The next time RVTools is started it will use the filter automatically.
- Bugfix: On vSnapshot tab the displayed filename and filesize are not always correct.
- Bugfix: Improved exception handling on vPort tab.

### Version 3.1 (April, 2011)

- Logon form tab order rearranged
- Logon form will remember your last selected host / vCenter server
- On vInfo new fields Provisioned, Used and shared storage
- On vInfo new fields install Boot Required, number of Virtual Disks
- On vInfo new fields Fault Tolerance State, FT Latency Status, FT Band width and FT Secondary Latency
- On vInfo new field 128-bit SMBIOS UUID of the virtual machine.
- On vDatastore new fields Total provisioned, Used and shared storage
- On vDatastore new fields SIOC enabled flag and congested threshold value
- On vDisk new field disk persistence mode.
- On vNetwork all IP addresses of adapter are now visible
- On vMemory new field distributed Memory Entitlement
- On vCPU new fields static Cpu Entitlement and field distributed Cpu Entitlement
- On vHost new fields Current EVC mode and Max EVC mode
- New batch command line parameters -u user and -p password
- Bugfix: custom fields not always visible on vSnapshot tab.
- Bugfix: Export to Excel, some numeric columns are saved as text instead of numbers
- RVToolsBatch.cmd with send by email example deployed in RVTools program file directory

### Version 3.0 (January, 2011)

- Pass-through authentication implemented. Allows you to use your logged on Windows credentials to automatically logon.
- All numeric columns are now formatted to make it more readable.
- On vInfo the columns Committed, Uncommitted, Shared and on vSnapshot the column size are now formatted in MBs instead of bytes.
- New tab page created with service console and VMKernel information.

- Now using vSphere Web Services SDK 4.1 which supports the new features available in vSphere 4.1
- Export to csv file now uses Windows regional separator
- Using NPOI to make it possible to write directly to xls files without the need for an installed Excel version on the system.
- New menu function to write all information to one Excel workbook with for each tab page a new worksheet.
- New command line options. Check the documentation!

### Version 2.9.5 (September, 2010)

- On vInfo tab new field: Guest heartbeat status. The heartbeat status is classified as: gray - VMware Tools are not installed or not running, red - no heartbeat, guest operating system may have stopped responding. yellow -intermittent heartbeat, may be due to guest load. green - guest operating system is responding normally
- On vMemory tab new fields: Ballooned memory, consumed overhead memory, private memory, shared memory, swapped memory and static memory entitlement
- On vDatastore tab new field: Full device address (controller, target, device)
- On vInfo tab new fields: Committed storage, uncommitted storage and unshared storage
- Bug fix! A semicolon in the annotations fields are no longer a problem for the export functions
- Bug fix! Health check "Zombie vmdk" problems solved
- Bug fix! Health check "inconsistent foldername" problems solved
- Bug fix! On vport tab the column "notify switch" value solved
- Bug fix! Sort problem on vNic tab on column "speed" solved

### Version 2.9.1 (May 4, 2010)

- Bug fix! On vNic tab unhandled exception when link is down.

### Version 2.9.1 (May 4, 2010)

- Bug fix! On vNic tab unhandled exception when link is down. Description in VI API Reference is excellent "The current link state of the physical network adapter. If this object is not set, then the link is down". Sorry guys this situation was not tested by me. This is fixed now.

### Version 2.9 (April 2010)

- On vHost tab new fields: Vendor and model.
- On vHost tab new fields: Bios version and Bios release date.
- On vInfo tab new field: VM overall size in bytes (visible when using VI API 4.0)
- On vSnapshot tab new fields: Snapshot filename and size in bytes (visible when using VI API 4.0)
- New vNic tab. The vNic tab displays for each physical nic on the host the following fields: Host, datacenter, cluster name, network device, driver, speed, duplex setting, mac address, PCI and wakeon switch.
- Layout change on vHost, vSwitch and vPort tab pages. They now all start with host name, datacenter and cluster name.

- The commandline function ExportAll extended with an extra optional parameter. It's now possible to specify the directory where the export files are written.

### Version 2.8.1 (February 2010)

- On vHost tab new field: number of running vCPUs
- On vSphere VMs in vApp where not displayed.
- Filter not working correct when annotations or custom fields contains null value.
- When NTP server(s) = null the time info fields are not displayed on the vHost tab page.
- When datastore name or virtual machine name contains spaces the inconsistent foldername check was not working correct.
- Tools health check now only executed for running VMs.

### Version 2.8 (January 2010)

- On vHost tab field "# VMs" now only powered on VMs are counted.
- On vHost tab field "VMs per core" now only powered on VMs are counted.
- On vHost tab field "vCPUs per core" now only powered on VMs are counted.
- On vDatastore tab field "# VMs" now only calculated for VM's which are powered on.
- Health check "Number of running virtual CPUs per core" now only powered on VMs are counted.
- Health check "Number of running VMs per datastore" now only powered on VMs are counted.
- During Installation there will be an application event source created for RVTools. This to fix some security related problems.
- Some users run into a timeout exception from the SDK Web server. The default web service timeout value is now changed to a higher value.
- New fields on vHost tab: NTP Server(s), time zone information, Hyper Threading information (available and active), Boot time, DNS Servers, DHCP flag, Domain name and DNS Search order
- New Health Check: Inconsistent folder names.
- Improved exception handling on vDisk, vSwitch and vPort tab pages.

### Version 2.7.3 (December 19, 2009)

- With the help of Ciaran Garvey, Benj Starratt and Shane Wendel I was able to improve the zombie file discovery. Thanks to all.
- Files in .snapshot directories are no longer reported as zombies.
- CTK files are no longer reported as zombies.
- The problems with VM files which are placed in the root directory are now solved.
- Under some condition the filter screen terminated with an exception. This is fixed now.
- New fields on vDisk tab: ThinProvisioned and split.
- New field on vTools tab: Virtual machine hardware version.

### Version 2.7.1 (November 19, 2009)

- 15 minutes after the release of version 2.7 I received an email from Kyle Ross who told me that RVTools was showing the cos and esxconsole VM's as zombies! This problem is now fixed! Thanks again Kyle for alerting me so soon.

### Version 2.7 (November, 2009)

- RVTools now reports storage which is wasted by zombie VMs, VMDKs, templates and snapshots. You can find this information on the vHealth tab page. If you guys pay me a dime for every gigabyte of wasted storage, found by RVTools, you will make me rich ☺.
- Due to the fact that the search all datastores task can take a long time to complete, RVTools now use a separate thread to collect this information.
- The default percentage value of "free datastore capacity" is changed from 10% to 15%.
- Bug fix! If a snapshot is more than two levels deep, only the first two are visible. With the input from Mike Price this problem is now solved! Thanks again Mike.

### Version 2.6 (September, 2009)

- RVTools is now using the vSphere 4 SDK. The SDK has been enhanced to support new features of ESX/ESXi 4.0 and vCenter Server 4.0 systems.
- On vNetwork tab the Vmxnet2 information is improved (due to the new SDK).
- The name of the vCenter server or ESX host to which RVTools is connected is now visible in the windows title.
- New menu option: Export All. Which exports all the data to csv files.
- Export All function can also started from the command line. The output files are written to a unique directory in the users documents directory.
- New vSwitch tab. The vSwitch tab displays for each virtual switch the name of the switch, number of ports, free ports, promiscuous mode value, mac address changed allowed value, forged transmits allowed value, traffic shaping flag, width, peak and burst, teaming policy, reverse policy flag, notify switch value, rolling order, offload flag, TSO support flag, zero copy transmits support flag, maximum transmission unit size, host name, datacenter name and cluster name.
- New vPort tab. The vPort tab displays for each port the name of the port, the name of the virtual switch where the port is defined, VLAN ID, promiscuous mode value, mac address changed allowed value, forged transmits allowed value, traffic shaping flag, width, peak and burst, teaming policy, reverse policy flag, notify switch value, rolling order, offload flag, TSO support flag, zero copy transmits support flag, size, host name, datacenter name and cluster name.
- Filter is now also working on vHost, vSwitch and vPort tab.
- Health check change: number of virtual machines per core check is changed to number of virtual CPUs per core.

### Version 2.5.5 (June 27, 2009)

- Changed health check properties are not set at start of the program. The program will use the default values until you start and transmit the properties screen. This problem is now fixed.
- Since version 2.5 the vDisk tab displays information that is aggregated from "config.hardware" and "guest" information. That was not a good idea! If there is more than one partition on a virtual disk the displayed information is wrong. To solve this problem I now split this information in a vDisk tab which will show only the information that is provided by the "config.hardware" information and a new vPartition tab that will display the "guest" information.
- Better exception handling on filter.

- New fields on vHost tab: Number of CPUs, Cores per CPU and virtual CPUs per Core.

### Version 2.5.1 (April 15, 2009)

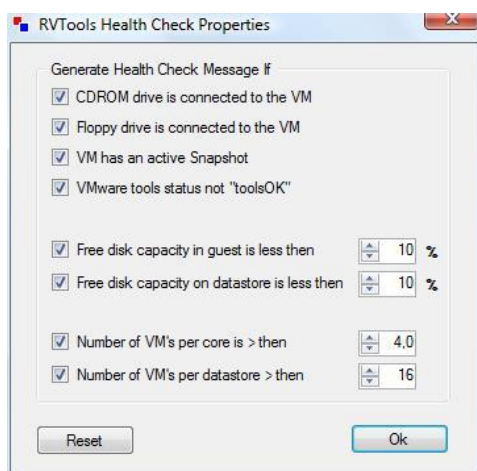
- Bug fix! Better exception handling on the vDisk and vNetwork tab pages. With the help from Alan Civita this problem is now solved! Thanks again Alan.

### Version 2.5 (April 2009)

- The installation file now understands how to upgrade without the need to uninstall the previous version first.
- The documentation file is now also deployed to the program directory. You can start the Adobe reader from the RVTools "help" menu.
- New fields on vInfo tab: Network #1 to Network #4
- New fields on vDisk tab: Level, Shares, SCSI Controller, Unit id and vmdk path name. I'm now using the "config.hardware" information to fill this tab page. In the previous versions of the program I was using the guest information which have a strong dependency with the VMware tools.
- New fields on vNetwork tab: Adapter type and Mac Address type. I'm now using the "config.hardware" information to fill this tab page. In the previous versions of the program I was using the guest information which have a strong dependency with the VMware tools.
- New field on vHost tab: Number of VMs per core
- New tab! vHealth. Displays health check messages.

There are 8 possible "Health Check" messages:

1. VM has a CDROM device connected!
  2. VM has a Floppy device connected!
  3. VM has an active snapshot!
  4. VMware tools are out of date, not running or not installed!
  5. On disk xx is yy% disk space available! The threshold value is zz%
  6. On datastore xx is yy% disk space available! The threshold value is zz%
  7. There are xx VMs active per core on this host. The threshold value is zz
  8. There are xx VMs active on this datastore. The threshold value is zz
- You can set your "own" health check threshold values in the "Health Check Properties" form.

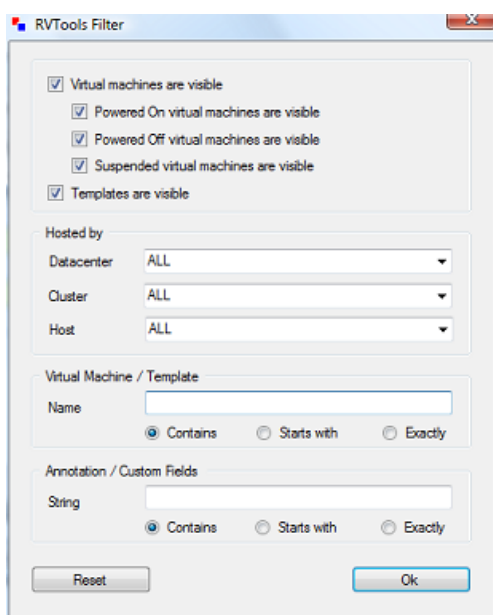


### Version 2.4.1 (March 18, 2009)

- The new filter throws an exception when there are ESX hosts which do not belong to any cluster. With the help from Mario Vinet this problem is now solved! Thanks again Mario.

### Version 2.4 (March 2009)

- On the vDatastore tab you can now see which hosts are connected to the datastore.
- The data on the vInfo, vCpu, vMemory, vDisk, vFloppy, vCD, vSnapshot and vTools tab pages can now be filtered.



### Version 2.3.1 (February 11, 2009)

- System.InvalidCastException: Unable to cast object of type 'VimApi.NasDatastoreInfo' to type 'VimApi.VmfsDatastoreInfo' bug on vDatastore tab fixed!

### Version 2.3 (February 2009)

- New vHost tab. The "vHost" tab displays for each host the name, datacenter name, cluster name, CPU model, CPU speed, number of CPU's, CPU usage %, total amount of memory, memory usage %, memory reserved for the service console, number of NIC's, number of HBA's, number of VM's running on this host and the ESX version of this host.
- All tab pages (except the datastore tab) now also display the datacenter name and cluster name.
- New VMFS "Block size", "Max Blocks", "Number of extents", "Major Version number", "Version string" and "VMFS upgradeable" fields on the vDatastore tab.
- New "Virtual machine version string" field on the vInfo tab page.
- Divide by zero bug on vDatastore tab is now fixed.

- The vInfo fields "upgrade policy" and "Sync.time with host" which were introduced in version 2.2 caused some problems in combination with the 2.0 version of the VI API. This is now fixed!

### Version 2.2 (January 2009)

- New vDatastore tab. The "vDatastore" tab displays for each datastore the name, connectivity status, file system type, number of virtual machines on the datastore, total capacity in mb's, free capacity in mb's, multiple host access indication and the url.
- Your custom defined fields are now visible on most of the tab pages
- New menu option "export data to cvs file"
- New "upgrade policy" field on vTools tab page
- New "Sync time with host" field on vTools tab page
- The field "OS" which is displayed on most of the tab pages now displays the name of the guest OS according to the VMware Tools. In previous versions we used the configuration value. The vTools tab displays both "OS" fields.

### Version 2.1 (November 2008)

- Overall performance improvements.
- New vInfo tab. The "vInfo" tab displays for each virtual machine the hostname of the guest, power state, power on date / time, number of cpu's, amount of memory, number of nics, configuration path, annotation, ESX host name, operating system name and VI SDK object id.
- New CPU tab. The "vCpu" tab displays for each virtual machine number of cpu's, max cpu, overall cpu usage, shares, reservations, limits, annotations, ESX host name and operating system name.
- New Memory tab. The "vMemory" tab displays for each virtual machine the memory size, max memory usage, memory overhead, guest memory, host memory, shares, reservations, limits, annotations, ESX host name and operating system name
- New snapshot tab. The "vSnapshot" tab displays for each snapshot the name, description, date / time of the snapshot, quiesced value, state value, annotations, ESX host name and operating system name.
- The header text is automatically included after a copy and past action. This version 1.1 functionality was "lost" in version 2.0.

### Version 2.0 (October 2008)

- RVTools has five new tab pages which give you information about your virtual machines. RVTools displays information about cpu, memory, disks, nics, cd-rom, floppy drives and VMware tools. With RVTools you can disconnect the cd-rom or floppy drives from the virtual machines. It's also possible to start an upgrade of the VMware Tools.

### Version 1.1 (May 2008)

- You can copy the selected datagrid values with ctrl-c to the clipboard. The header text is automatically included. After this you can paste the clipboard data to your favorite editor.

- The login form remembers the names and/or IP addresses of the entered ESX hosts and/or VirtualCenter servers. You can use a filter to display only the "templates" or "virtual machines".
- Annotations "notes" field is visible in the datagrid.

### **Version 1.0 (April 2008)**

- First public release.