www.robware.net/rvtools

Dell Technologies

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RVTools

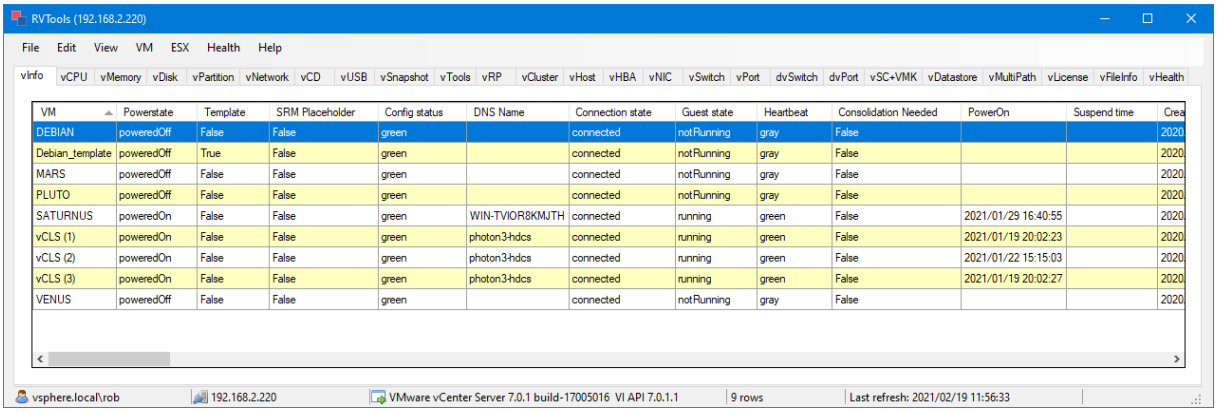
RVTools is a Windows .NET 4.6.2 application which uses VMware vSphere Management SDK 8.0 and CIS REST API to display information about your virtual environments.

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 and health checks.

The information can be exported to csv and xlsx file(s). With a xlsx merge utility it's possible to merge muliple 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, suspend date / time, creation date / time, change version, number of cpu's, latency-sensitivity, amount of memory, number of nics, number of virtual disks, total disk capacity, min Required EVC Mode Key, 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, 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 acoording to the VMware tools, 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

Display name of the virtual machine.

Powerstate

This column list 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 whether or not 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 whether or not 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
Whether any disk of the virtual machine requires consolidation. This can happen for example 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.

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

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 time-stamp. However, a client should always treat this as an opaque string.

CPU's
Number of processors in the virtual machine.

Latency-sensitivity
The latency-sensitivity of the virtual machine.

Memory
Memory size of the virtual machine, in megabytes.

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.

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. See EVCMode. 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).

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

DAS Protection
Whether 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 currenly 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. ftLatencyStatus is: 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 wallclock that the VCPU of the secondary fault tolerance VM is behind the VCPU of the primary VM. The unit is millisecond.

Provisioned MiB
Total storage space, in MiB, committed to this virtual machine across all datastores.

Essentially an aggregate of the property commited across all datastores that this virtual machine is located on.

In use MiB
Storage in use, space in MiBs, used by this virtual machine on all datastores.

Unshared MiB
Total storage space, in MiB, 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 whether or not 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 reponse 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.

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 whether 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
Whether 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 snapshotted 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.

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 hexademical 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.

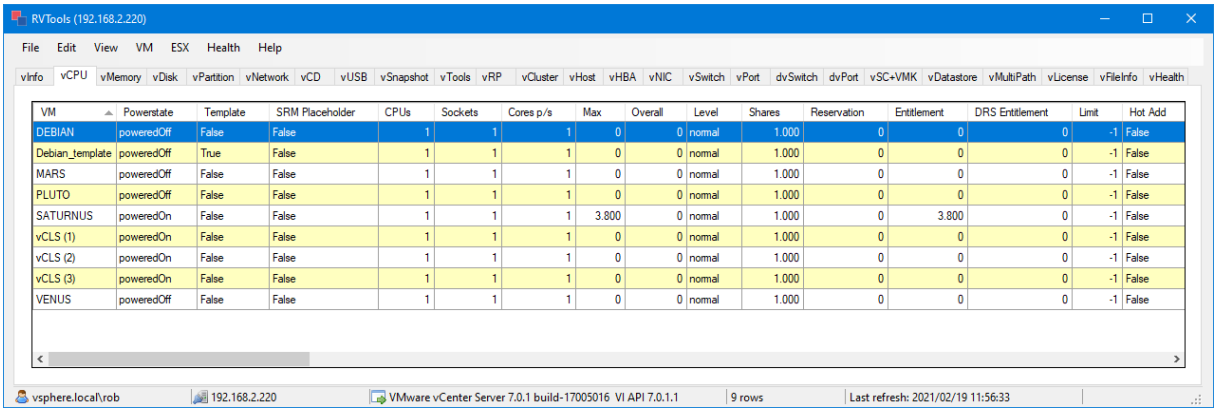
Virtual machine tags
Since version vSphere 6.5 tag information can be read from the CIS Rest API.
Tags will be only be visible in RVTools when logged on with userid/password.

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 acoording 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 list 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. The 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
Value which will show you whether virtual processors can be added while this virtual machine is running.

Hot Remove
Value which will show you whether virtual processors can be removed while this virtual machine is running.

Numa Hotadd Exposed
Whether 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 hexademical string. This identifier is used by VirtualCenter to uniquely identify all virtual machine instances, including those that may share the same SMBIOS UUID.

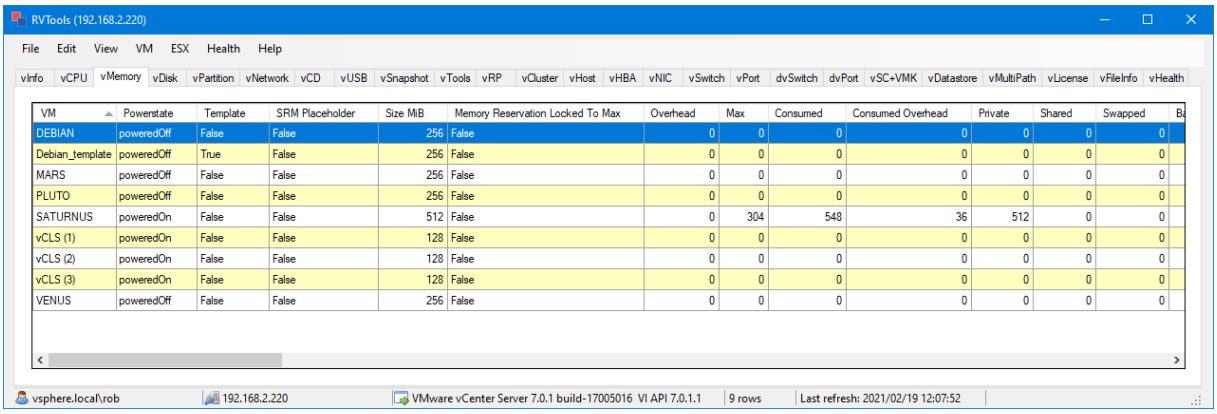
VI SDK Server
VI SDK Server which is used by RVTools to gather the information.

Virtual machine tags
Since version vSphere 6.5 tag information can be read from the CIS Rest API.
Tags will be only be 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 acoording 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 list 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 Mebibytes.

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 MiB) 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 MiB). 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 MiB. 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 MiB, for this VM. ***Since*** vSphere API 4.0

Private
The portion of memory, in MiB, that is granted to this VM from non-shared host memory. ***Since*** vSphere API 4.0

Shared
The portion of memory, in MiB, that is granted to this VM from host memory that is shared between VMs. ***Since*** vSphere API 4.0

Swapped
The portion of memory, in MiB, 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 MiB. 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 MiB. 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 MiB, that this VM is entitled to, as calculated by DRS. Valid only for a VM managed by DRS.

Level
The allocation level. The 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
Whether 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
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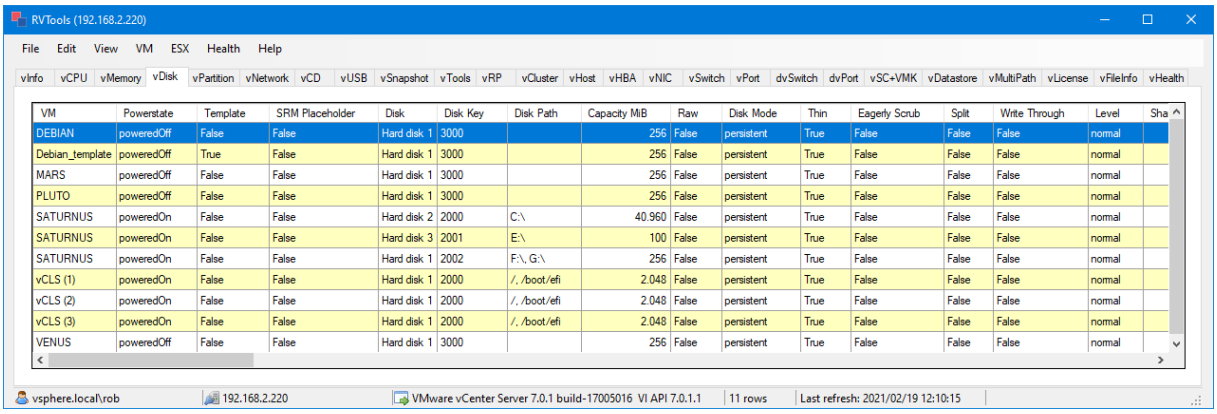
VI SDK Server
VI SDK Server which is used by RVTools to gather the information.

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 compability 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 acoording to the VMware tools, VM ID, VM UUID, virtual machine tags, VI SDK Server and VI SDK UUID.



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Display name of the virtual machine.

Powerstate
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NAME	DESCRIPTION
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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 Mebibytes. 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, whether 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 whether 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
Flag to indicate whether writes should go directly to the file system or should be buffered.

Level
The allocation level. The 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. It 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

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 hexademical string. This identifier is used by VirtualCenter to uniquely identify all virtual machine instances, including those that may share the same SMBIOS UUID.

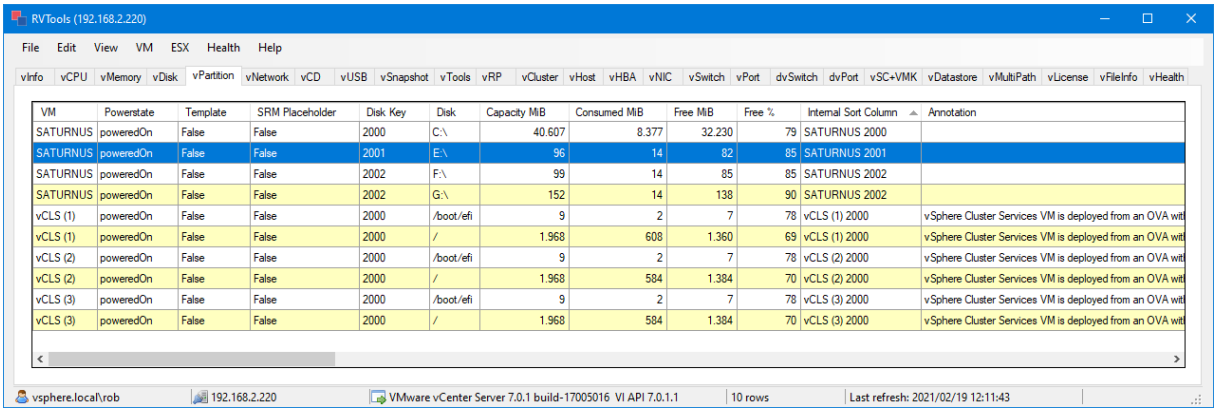
Virtual machine tags
Since version vSphere 6.5 tag information can be read from the CIS Rest API.
Tags will be only be visible in RVTools when logged on with userid/password.

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 acoording 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 list 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 Mebibytes.

Consumed MiB
Total consumed capacity of the disk, in Mebibytes.

Free MiB
Free space on the disk, in megabytes. This is retrieved by VMware Tools.
Is empty when the information from the VMware tools are not available.

Free %
Percentage free space on the disk.
Is empty when the information from the VMware tools are 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 hexademical 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 will be only be visible in RVTools when logged on with userid/password.

VI SDK Server

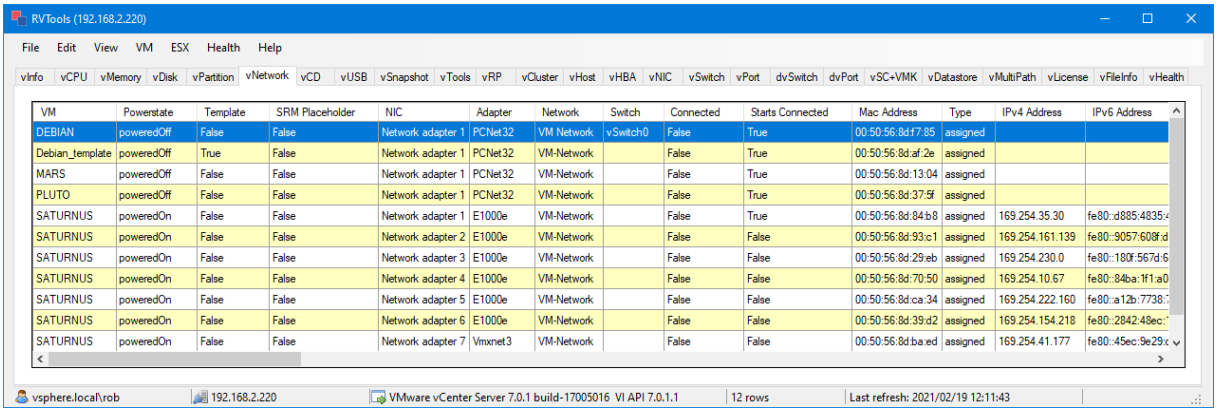
VI SDK Server which is used by RVTools to gather the information.

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 acoording 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 list 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 whether 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 hexademical string. This identifier is used by VirtualCenter to uniquely identify all virtual machine instances, including those that may share the same SMBIOS UUID.

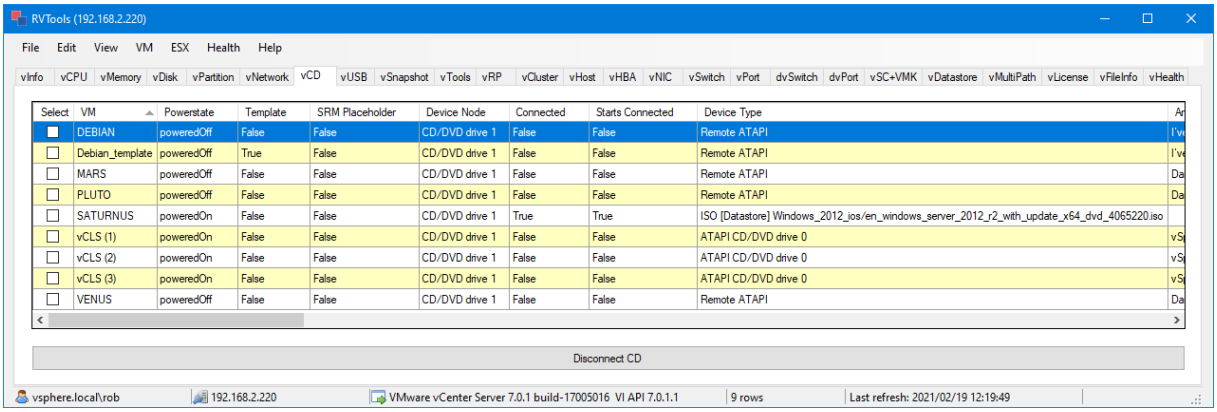
Virtual machine tags
Since version vSphere 6.5 tag information can be read from the CIS Rest API.
Tags will be only be visible in RVTools when logged on with userid/password.

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 for each virtual machine CD-Rom information: 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 acoording 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 list 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 hexademical string. This identifier is used by VirtualCenter to uniquely identify all virtual machine instances, including those that may share the same SMBIOS UUID.

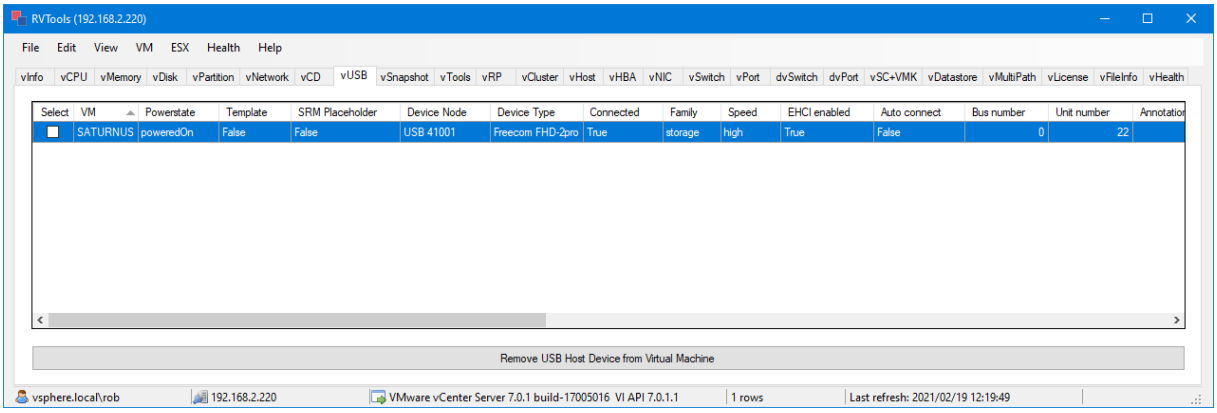
Virtual machine tags
Since version vSphere 6.5 tag information can be read from the CIS Rest API.
Tags will be only be visible in RVTools when logged on with userid/password.

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 acoording 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 list 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
Flag to indicate whether or not enhanced host controller interface (USB 2.0) is enabled on this controller.

Auto connect
Flag to indicate whether or not 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 hexademical string. This identifier is used by VirtualCenter to uniquely identify all virtual machine instances, including those that may share the same SMBIOS UUID.

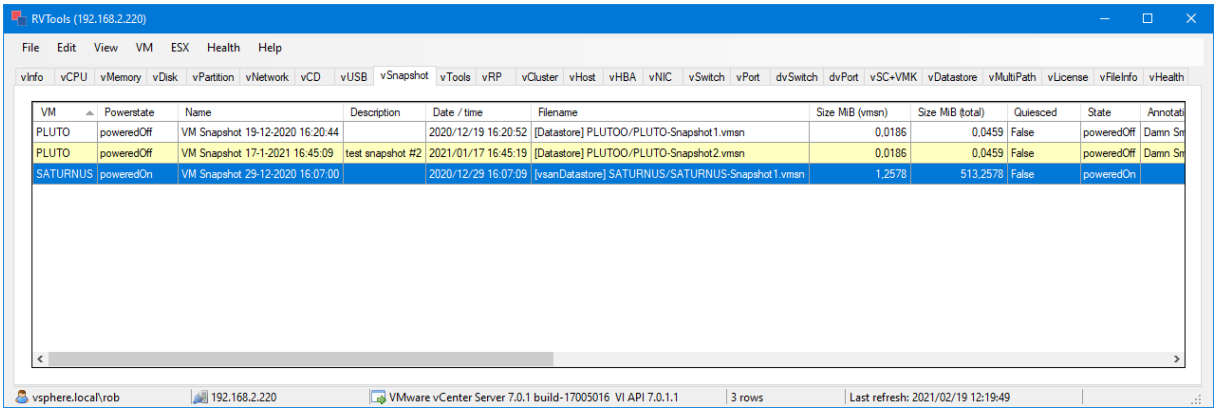
Virtual machine tags
Since version vSphere 6.5 tag information can be read from the CIS Rest API.
Tags will be only be visible in RVTools when logged on with userid/password.

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 acoording 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 list 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 all snapshots for this VM.

Quiesced
Flag to indicate whether or not 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 hexademical 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 will be only be visible in RVTools when logged on with userid/password.

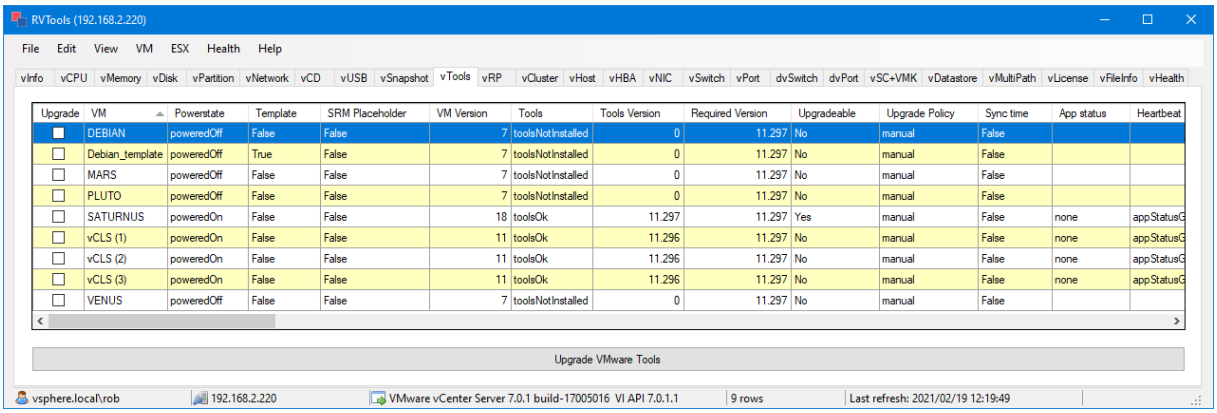
VI SDK Server
VI SDK Server which is used by RVTools to gather the information.

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 acoording 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.



VM
Display name of the virtual machine.

Powerstate
This column list 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                                 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                                 12.1.0          20219665
10361       esx/0.0                                 10.3.25         20206839
12294       esx/0.0                                 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                                 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                                 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 specify whether or not the tools are upgradeable from this application.

Upgradeable
Column which specify whether or not 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 whether or not 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 vitrual 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 hexademical string. This identifier is used by VirtualCenter to uniquely identify all virtual machine instances, including those that may share the same SMBIOS UUID.

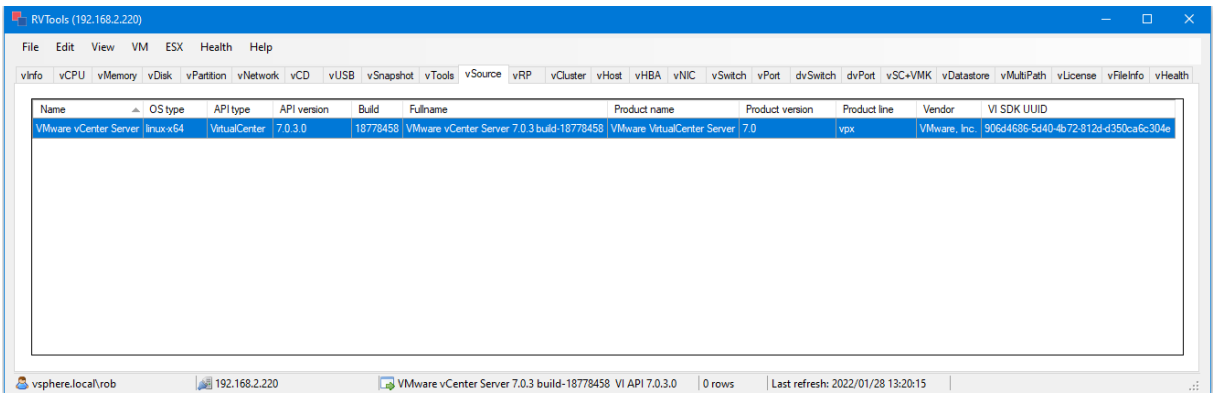
Virtual machine tags
Since version vSphere 6.5 tag information can be read from the CIS Rest API.
Tags will be only be visible in RVTools when logged on with userid/password.

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

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 whether or not 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.

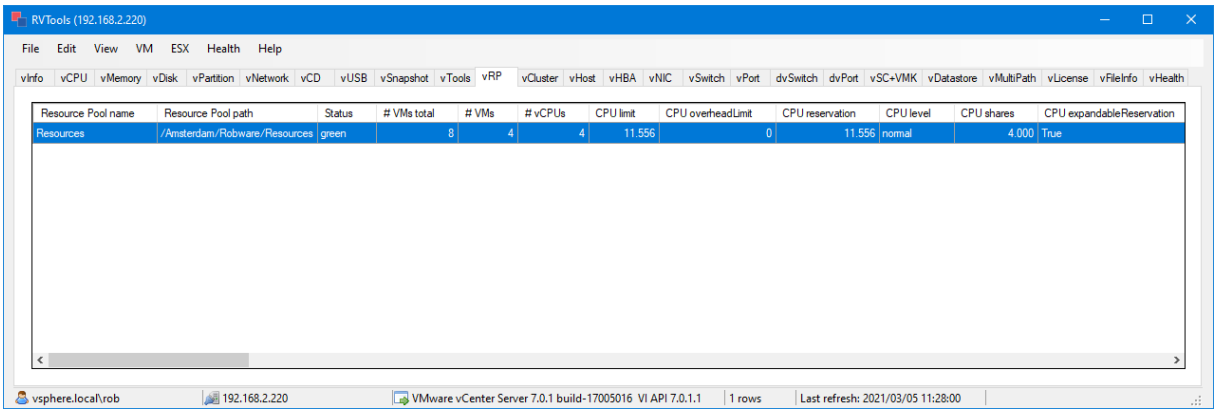
Vendor
Name of the vendor of this product.

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 overal 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: undercommited (green), overcommited (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 undercommitted)**: 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 whether the cluster is undercommitted 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, hosts 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. The 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 undercommitted 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 MiB.
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. The 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 undercommitted 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 MiB. 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 MiB, 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 MiB, 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 MiB. 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 MiB. This is also known as consummed 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 MiB) 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 MiB, that is granted to a virtual machine from non-shared host memory.

QS sharedMemory
The portion of memory, in MiB, that is granted to a virtual machine from host memory that is 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 MiB, 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.

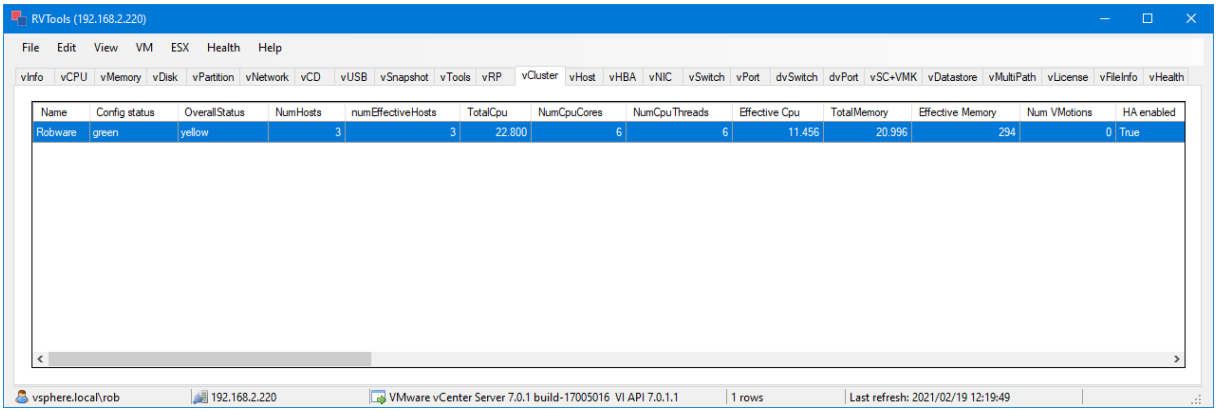
Resource pool tags
Since version vSphere 6.5 tag information can be read from the CIS Rest API.
Tags will be only be visible in RVTools when logged on with userid/password.

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 memeory, number of vMotions, HA enabled flag, failover level, Admission control enabled flag, host monitoring flag, heart beat datastore condidate 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 whether or not 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 MiB.

Effective Memory
Effective memory resources (in MiB) 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
Flag to indicate whether or not 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
Flag that determines whether 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 whether 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 whether or not 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 reponse 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
Flag to indicate whether or not 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
Flag indicating whether or not 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.

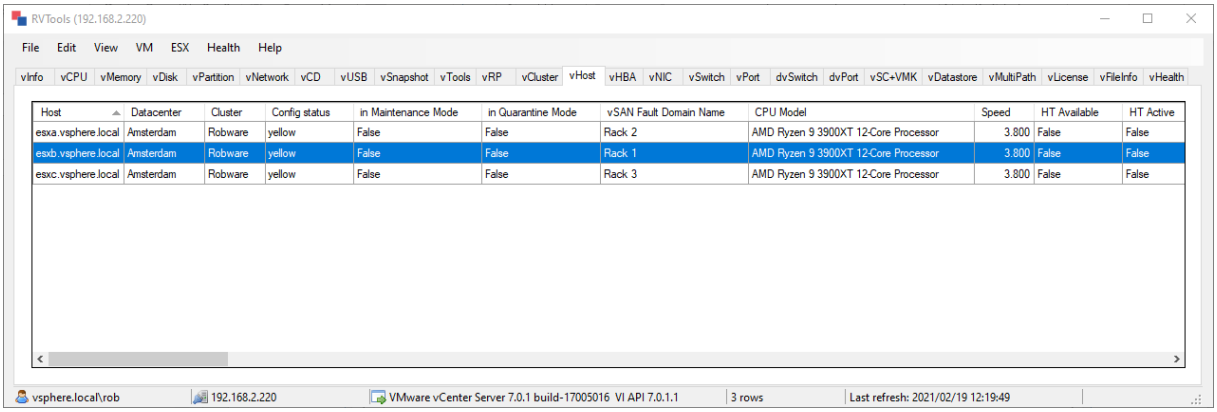
Cluster tags
Since version vSphere 6.5 tag information can be read from the CIS Rest API.
Tags will be only be visible in RVTools when logged on with userid/password.

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 name, datacenter name, cluster name, config status, 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 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, DNS Search Order, NTP Server(s), NTPD running, Time Zone, Time Zone Name, GMT Offset, harware vendor, model, serial number, Service tag (serial #), OEM specific string, BIOS vendor, BIOS version, BIOS date, Host object id, host tags, UUID, VI SDK Server and VI SDK UUID.



Host
Name of the ESX host.

Datacenter
Name of the datacenter.

Cluster
Name of the cluster.

Config status
The config status indicates whether or not 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.

Maintenance mode
The flag to indicate whether or not 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
The flag to indicate whether or not 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
The flag to indicate whether or not hyperthreading optimization is available on the system. This property is set by VMware prior to installation.

HT Active
The flag to indicate whether or not 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 MiB.

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 MiB, recently accessed.

VM Memory swapped
Guest memory: Total amount of memory in MiB, reclaimed by swapping.

VM Memory ballooned
Guest memory: Total amount of memory in MiB, reclaimed by ballooning.

VMotion support
Flag indicating whether you can perform VMotion.

Storage VMotion support
Indicates whether 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
The flag to indicate whether or not 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.

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
Flag indicating whether 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.

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

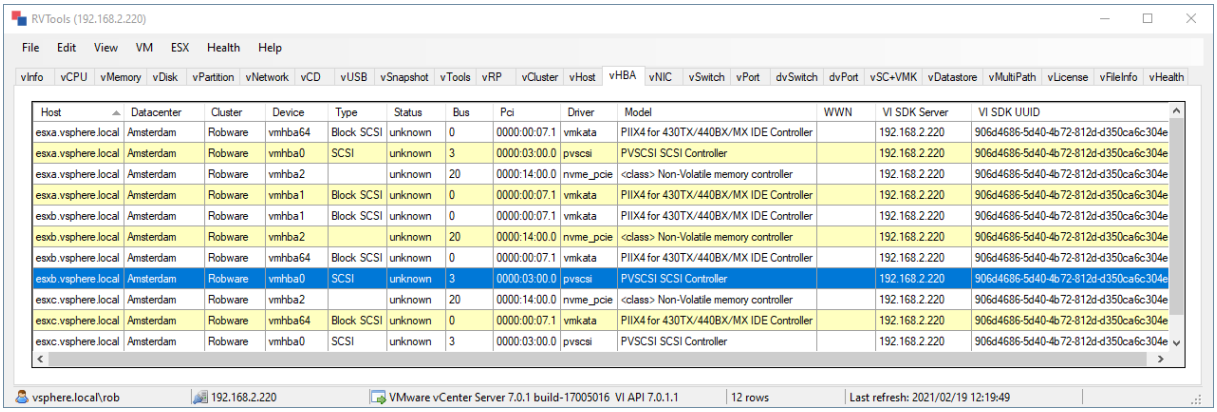
UUID
Hardware BIOS identification.

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
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.

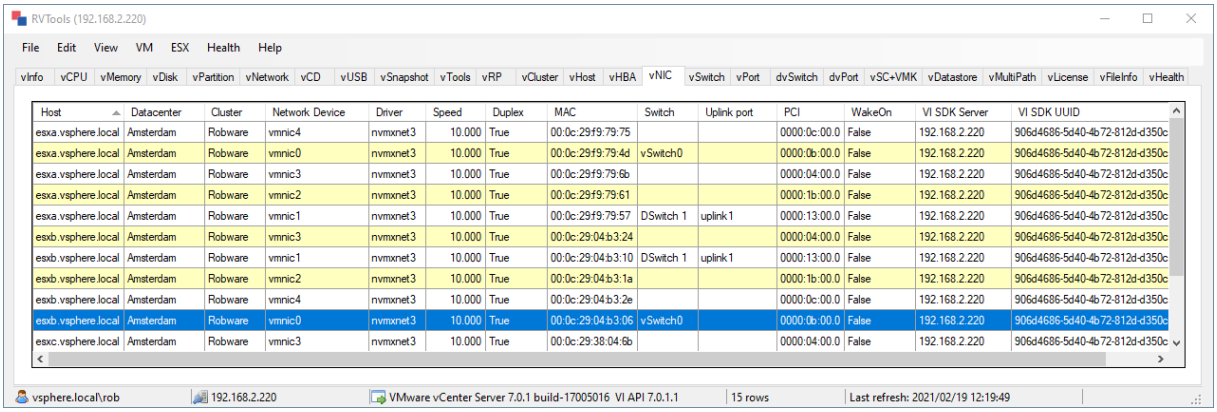
WWN
The worldwide port name for the adapter.

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
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
The flag to indicate whether or not 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.

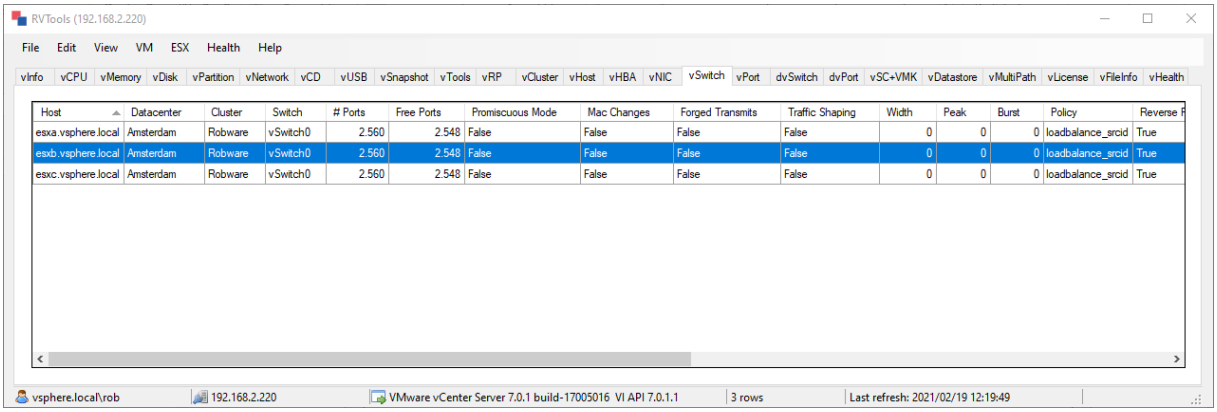
Wake on
Flag indicating whether the NIC is wake-on-LAN capable.

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 shapping 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
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 PortGroup. 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
The flag to indicate whether or not all traffic is seen on the port.

Mac Changes

The flag to indicate whether or not the Media Access Control (MAC) address can be changed.

Forged Transmits
The flag to indicate whether or not 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
The flag to indicate whether or not 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 explicity failover order.

Reverse Policy
The flag to indicate whether or not 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
Flag to specify whether or not 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
The flag to indicate whether or not 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 PortGroup are subject to this policy. There is no setting for an individual virtual machine to determine if an operation should be offloaded.

TSO
The flag to indicate whether or not TCP segmentation offloading (TSO) is supported.

Zero Copy Xmit
The flag to indicate whether or not zero copy transmits are supported.

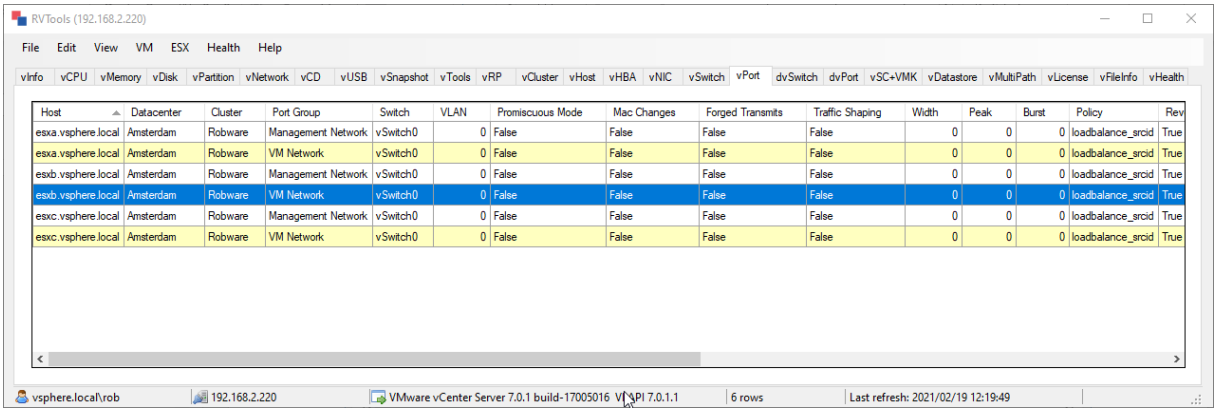
MTU
The maximum transmission unit (MTU) of the virtual switch in bytes.

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 shapping 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

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.

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

Promiscuous mode

The flag to indicate whether or not all traffic is seen on the port.

Mac Changes
The flag to indicate whether or not the Media Access Control (MAC) address can be changed.

Forged Transmits
The flag to indicate whether or not the virtual network adapter should be allowed to send network traffic with a different MAC address than that of the virtual network adapter.

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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
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The flag to indicate whether or not 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 PortGroup are subject to this policy. There is no setting for an individual virtual machine to determine if an operation should be offloaded.

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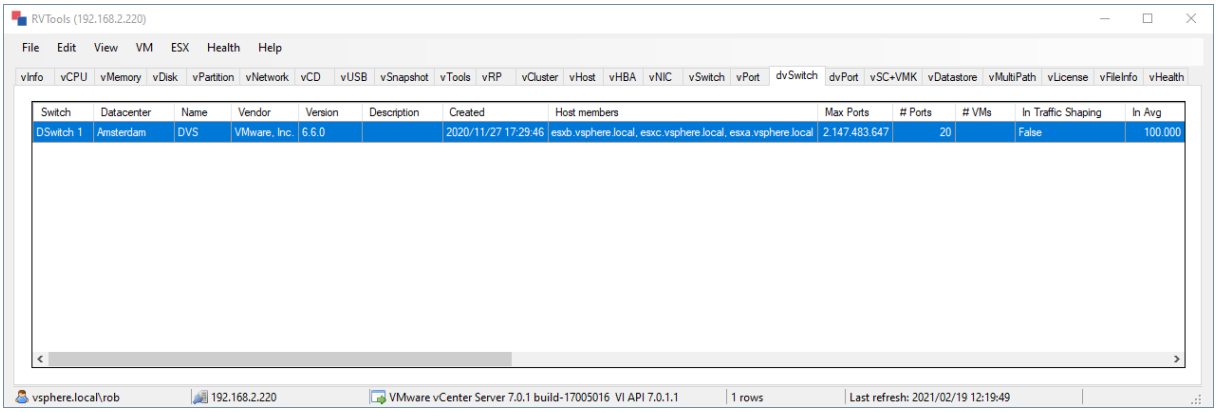
The flag to indicate whether or not zero copy transmits are supported.

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
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
The flag to indicate whether or not 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
The flag to indicate whether or not 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 maximumout-throughput burst size allowed in Kbytes if shaping is enabled on the port.

CDP Type
Only for Virtual Switch from VMware! 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.

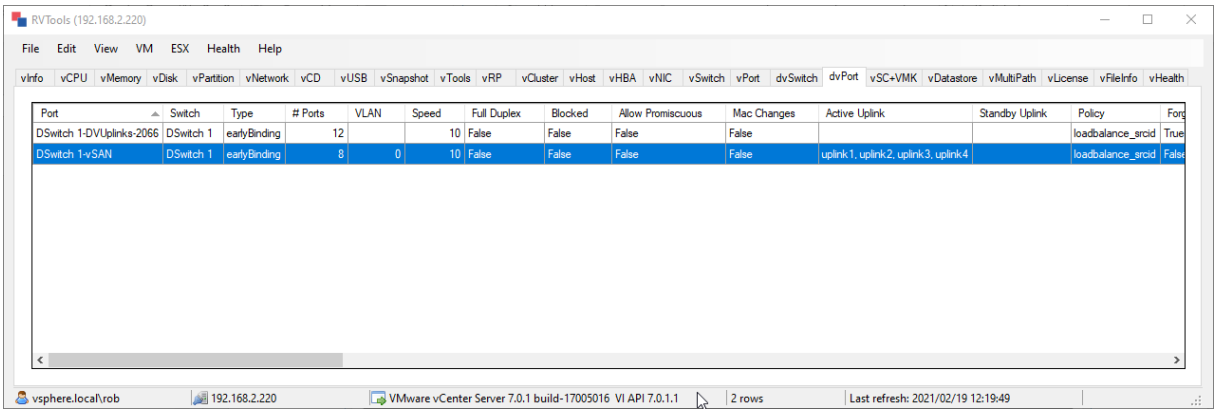
Cluster tags
Since version vSphere 6.5 tag information can be read from the CIS Rest API.
Tags will be only be visible in RVTools when logged on with userid/password.

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 portgroup.
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 portgroup has no limit on the number of ports that can be a part of this portgroup. In cases where the vCenter Server is unavailable the host can create conflict ports in this portgroup 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! The flag to indicate whether or not all traffic is seen on the port.

Mac Changes
Only for Virtual Switch from VMware! The flag to indicate whether or not 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! The flag to indicate whether or not 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
The flag to indicate whether or not 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
The flag to indicate whether or not 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 maximumout-throughput burst size allowed in Kbytes if shaping is enabled on the port.

Reverse Policy
Only for Virtual Switch from VMware! The flag to indicate whether or not the teaming policy is applied to inbound frames as well.

Notify Switch
Only for Virtual Switch from VMware! Flag to specify whether or not to notify the physical switch if a link fails.

Rolling Order
Only for Virtual Switch from VMware! The flag to indicate whether or not to use a rolling policy when restoring links.

Check Beacon
Only for Virtual Switch from VMware! The flag to indicate whether or not 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! The flag to indicate whether or not 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! The flag to indicate whether or not 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 ofsecurity policy for an individual port to override the default setting of a portgroup.

Traming 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.

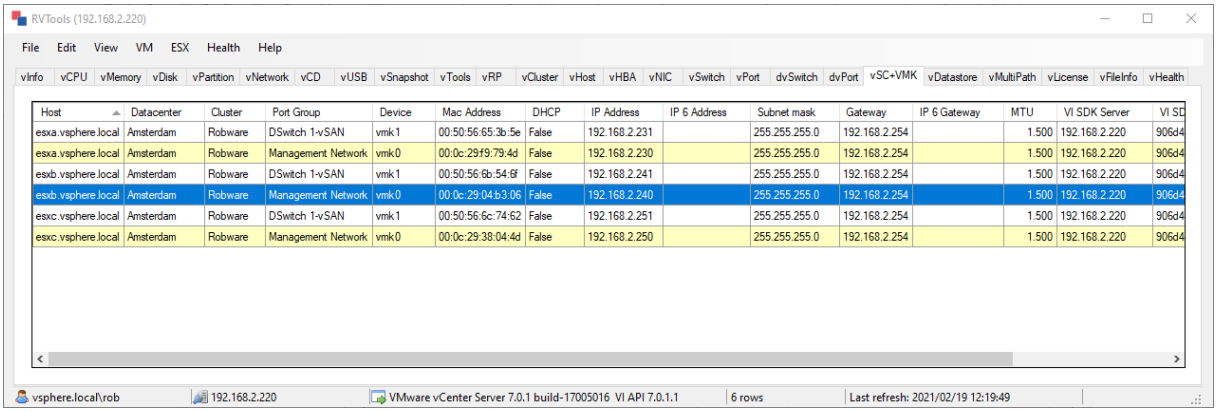
Tags
Since version vSphere 6.5 tag information can be read from the CIS Rest API.
Tags will be only be visible in RVTools when logged on with userid/password.

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
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 portgroup 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
The flag to indicate whether or not 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.

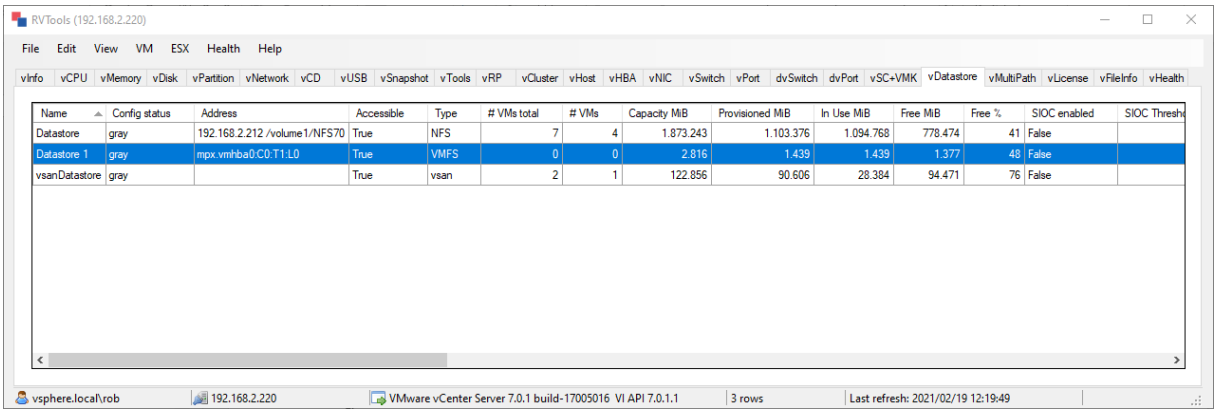
IP 6 Gateway
The default IP 6 gateway address.

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 MiB, Total provisioned storage in MiB, Used storage in MiB, shared storage in MiB, free capacity in MiB, 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
The name of the datastore.

Config status
The config status indicates whether or not 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 Mebibytes.

Provisioned MiB
Total storage space, in MiB, potentially used by all the virtual machines on this datastore.

In Use MiB
Total storage space, in MiB, on this datastore that is actually being used.

Free MiB
Free space on the datastore, in Mebibytes.

Free %
Percentage free space on the datastore.

SIOC Enabled
Flag indicating whether or not 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 MiB. 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 MiB. 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 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.

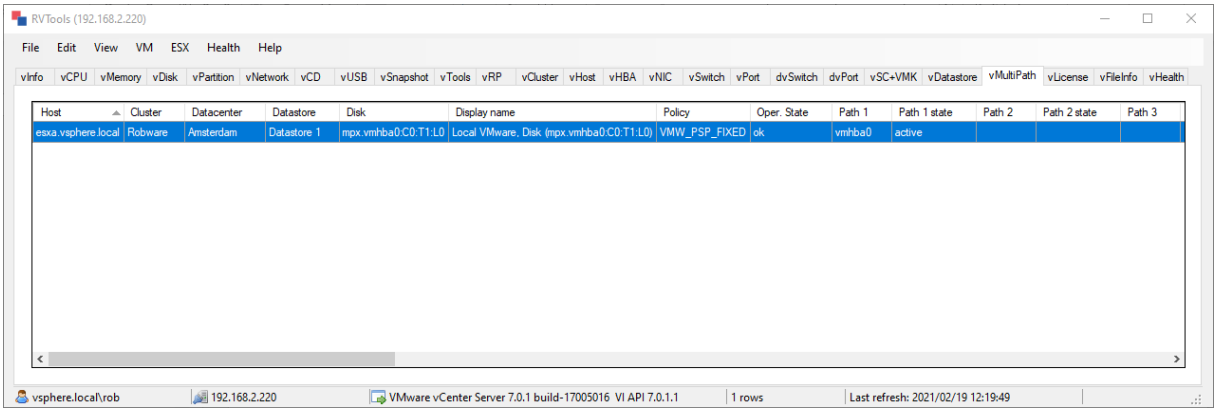
Tags
Since version vSphere 6.5 tag information can be read from the CIS Rest API.
Tags will be only be visible in RVTools when logged on with userid/password.

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.

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.

Opererational 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 whether 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.

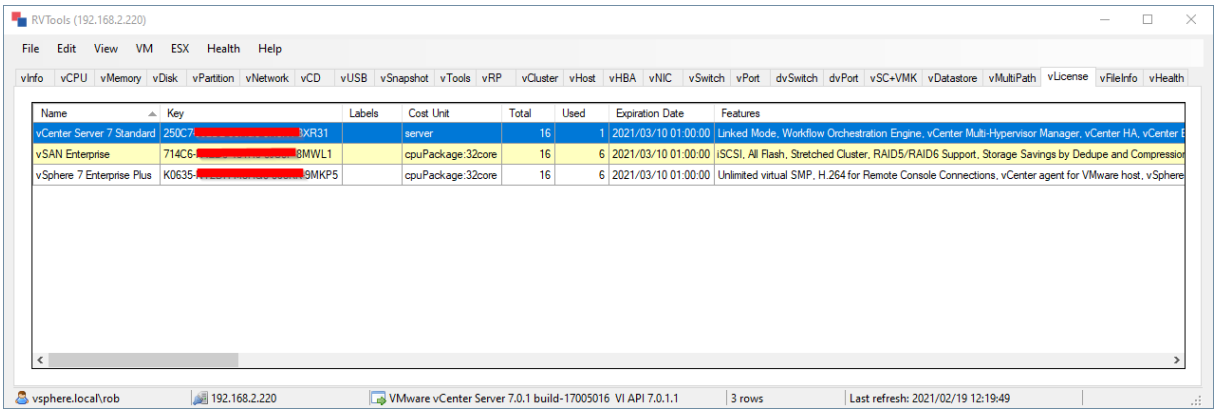
Object id
For internal use.

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.



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 numer of licenses.

Used
Used number of licenses.

Expiration data
License expiration date.

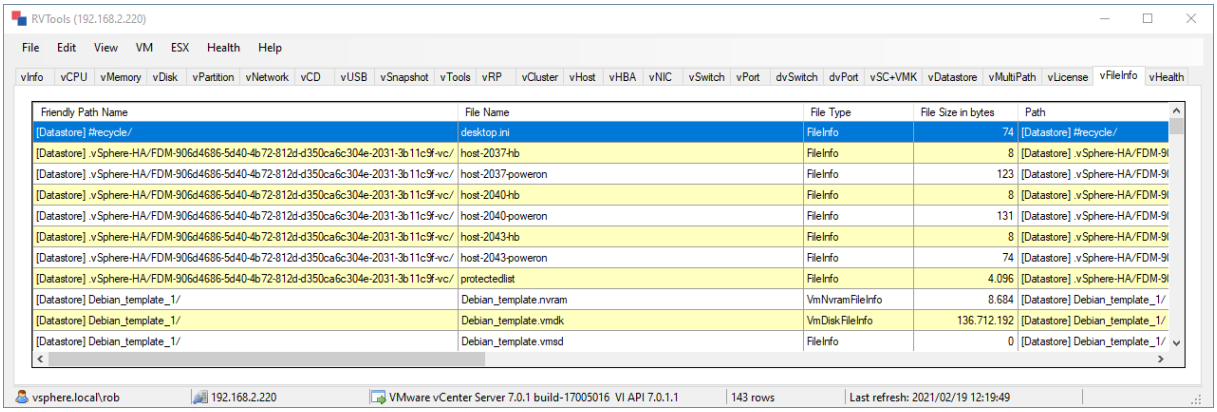
Features
List of license features

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
Friendly Path name

File Name
Name of the file.

File Type
File type.

File Size in bytes
File size in bytes.

Path
Path name.

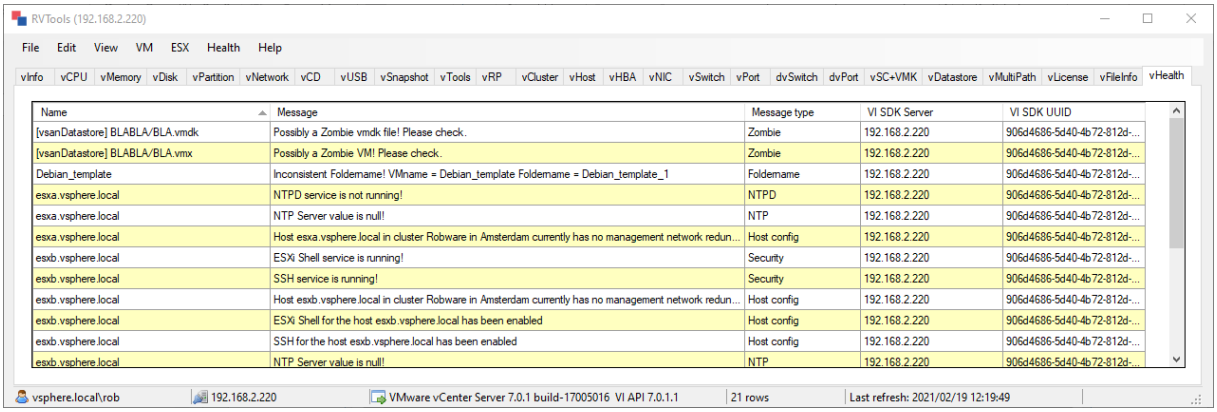
Internal Sort Column
Used for sorting the data.

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.



There are 23 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 virtal 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. Possible a zombie vmdk file! Please check.
10. Possible 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

VMWARE VM Performance optimization considerations

The performance optimizer & founder of www.fulldata.nl 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!

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).

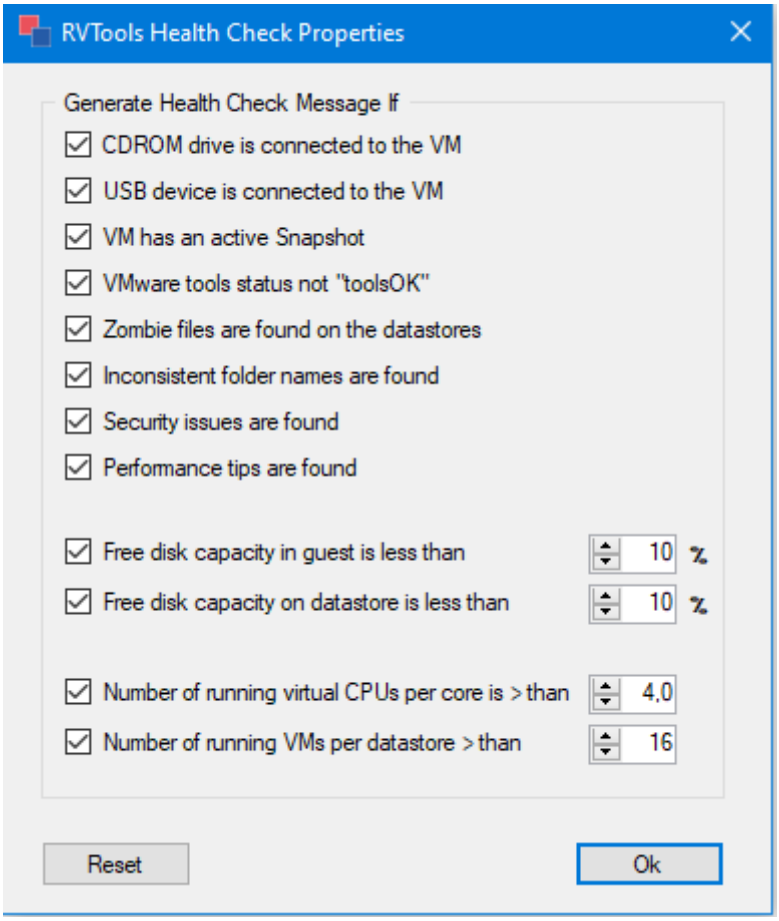
Note: the 'Hot Add CPU & Hot Add Memory' features are great options that help to simplify day to day operations, but they may limit overall performance. When the scale up flexibility isn't needed then disable them for best performance.

RVTools implementation

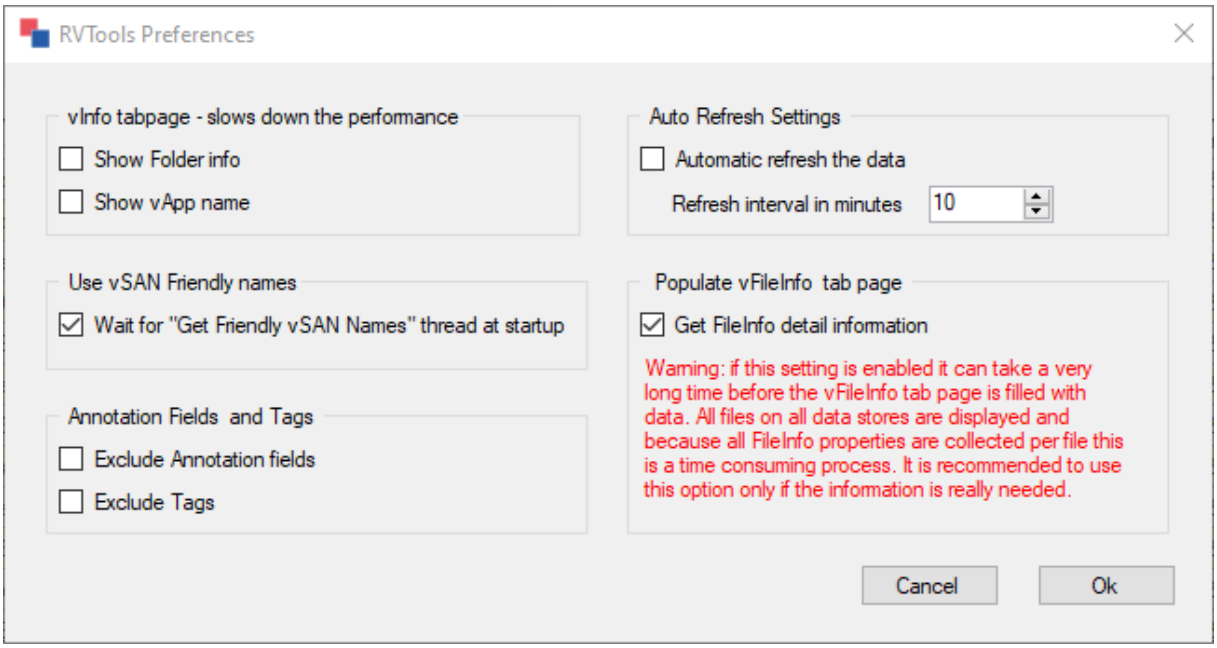
If VM is running and number of cores >= 4 and vnumaOnCpuHotaddExposed setting is false and CPU hot add is enabled or Memory hot add is enabled or one core per socket then a performance tip in vHealth tab page is shown.

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.

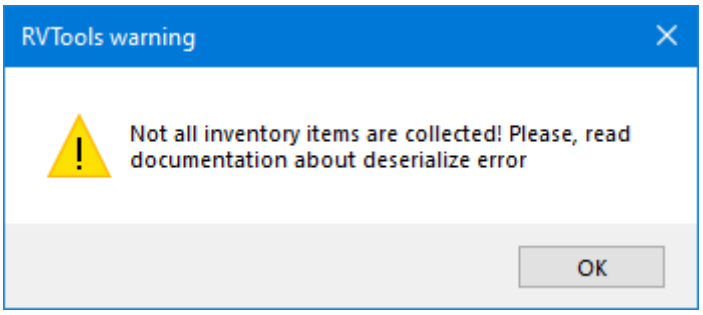
MB versus MiB

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



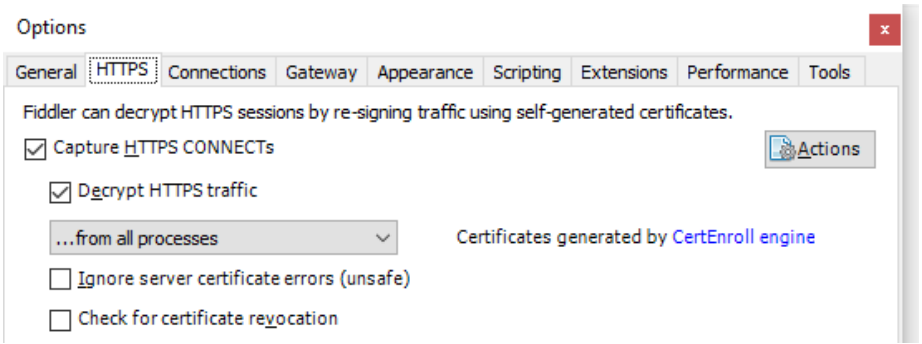
So far this error was not detected by RVTools and only part of the VM inventory was shown. Sometimes the VM tabs were empty or incomplete with a multiple of 100 VMs. I've had a lot of complaints about this over time but was always able to find the "bad" VM when de debug information was send to me.

I fully understand that it is often not allowed to share the debug information with me, so I describe in this chapter how you can find the "bad" VM and hopefully fix the problem yourself.

To find the problem you need to 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="OFF" /> 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 tabpage is displayed
- Stop RVTools
- Change the line <level value="DEBUG" /> to <level value="OFF" />

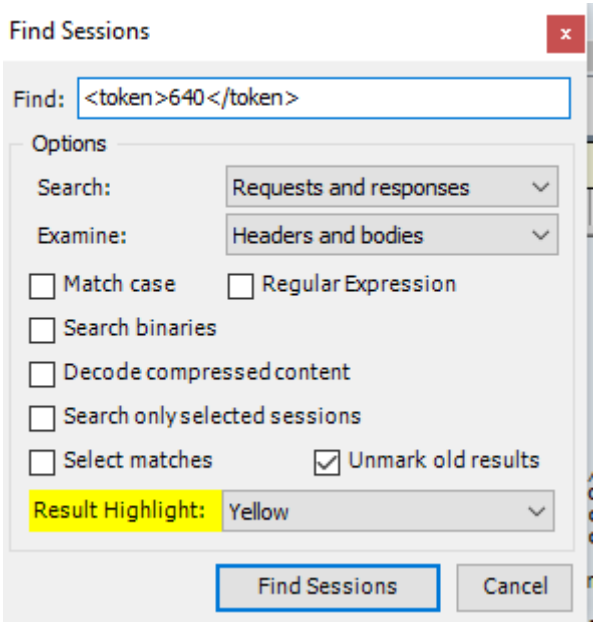


Open RVTools debug file in notepad++ and search for string “VirtualMachine result token" (find all in current document). Get the last one found as example:

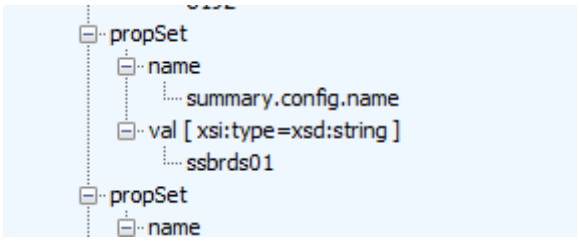
```
Line 1168: 2020-09-19 00:55:47,271 DEBUG RVTools.VISDK
retrievePropertiesEx VirtualMachine result token: 639
```

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>”



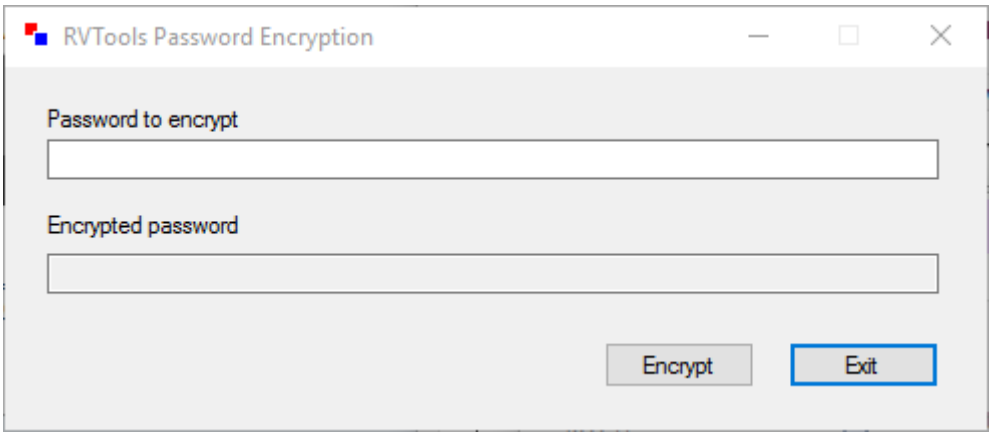
Open session as xml and expand all.
In the expanded xml screen you can find the name of the VM in the string of summary.config.name



I hope this will help to find the “bad” VM if not contact me.

Password encryption

In the RVTools program directory you can find a small application with which you can encrypt passwords for RVTools. You can use the encrypted password to start the application and/or the command line version of RVTools. The mac address is used to encrypt the password



Commandline parameters

Start RVTools with pass-through autentication

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 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 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 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.

-DBColumnNames

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:   1.1
# Date:      January, 2019
# By:        Rob de Veij
#
================================================================================

<#
.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 colums.
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 disabled <level value="OFF" />. The value <level value="DEBUG" /> will enable the logging. Take care when enabled 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="${ALLUSERSPROFILE}/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="OFF" />
      <appender-ref ref="RollingLogFileAppender" />
    </root>

</log4net>
```

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

Version information

Version 4.4.5 (October 18, 2023)

- Change in Author, Company, and Copyright to Dell Technologies.
- Contact email id update from rvtools@robware.net to 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 whether 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 expirimental 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 whether it is an SRM placeholder or not.
- 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 resourcepool.
- 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. A instruction is included in the documentation 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 where 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 where 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 en 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 –DBColumnNames 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 tabpage 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 tabpage sometimes not all switches/dvSwitches where 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 vLicence tabpage 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 eventlog
- 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 a 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 formated 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 formated to make it more readable.
- On vInfo the columns Commited, Uncommited, Shared and on vSnapshot the column size are now formated 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 a 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: Commited storage, uncommited 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 excelent "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 physival 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 custum 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 shapping 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 shapping 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.

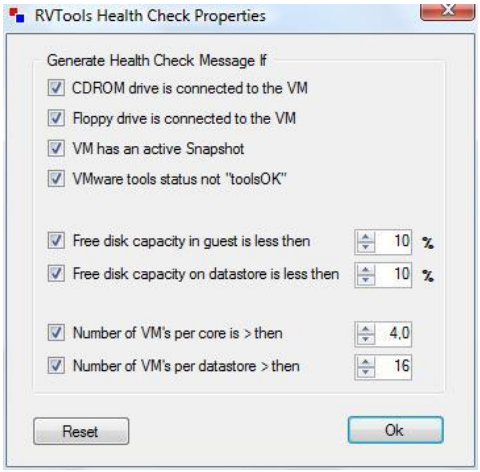
To solve this problem I now split this information in a vDisk tab which will show only the information that is provided by the "config.hardware" information and a new vPartition tab that will display the "guest" information.
- Better exception handling on filter.
- New fields on vHost tab: Number of 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.

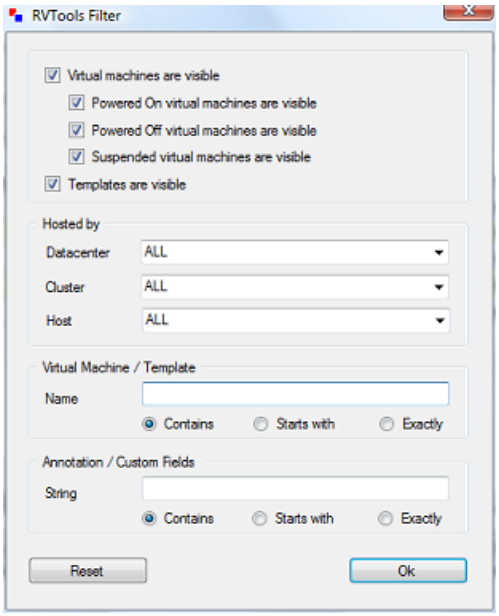


Version 2.4.1 (March 18, 2009)

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 where 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.