Unattended installation of VMware Tools in Windows

Disclaimer:

This documentation is provided "as is". It is not part of the official VMware product documentation. Basically this guide covers all steps which are needed to install VMware tools in a Windows VM using the native available MSI parameters. This could be used to roll out the tool using WSUS / SCCM or any other software delivery tool which can handle MSI installation packages.

This guide will not explain how the software rollout tool must be configured. Please refer to the documentation of your rollout tool for additional information. All commands needs to be specified on one line! Ignore the line break in this document!

Valentin Hamburger, Technical Account Manager

<h1 style="text-align:center">Let's get down to business</h1>

<h1 style="text-align:center">Unattended install of "VMware Tools.msi"</h1>

The main focus of this document is to describe the unattended installation of VMware Tools.

This enables the installation of VMware Tools during the default Windows patch / software installation, by simply adding the MSI package to the patch cycle.

To accomplish this, it is highly important that this kind of installation happens completely in the background without any user interaction.

It is also possible to suppress the automatic reboot of the OS after the VMware Tools installation.

> <u>WARNING:</u> Suppressing the reboot does not replace it – the reboot is required for the VMware Tools to work properly – though it can be done at a later time.

Logging the install and remove actions with MSI is extremely useful for tracking errors or to measure the success of the installation. However, log files will be overwritten by every run of the MSI file!
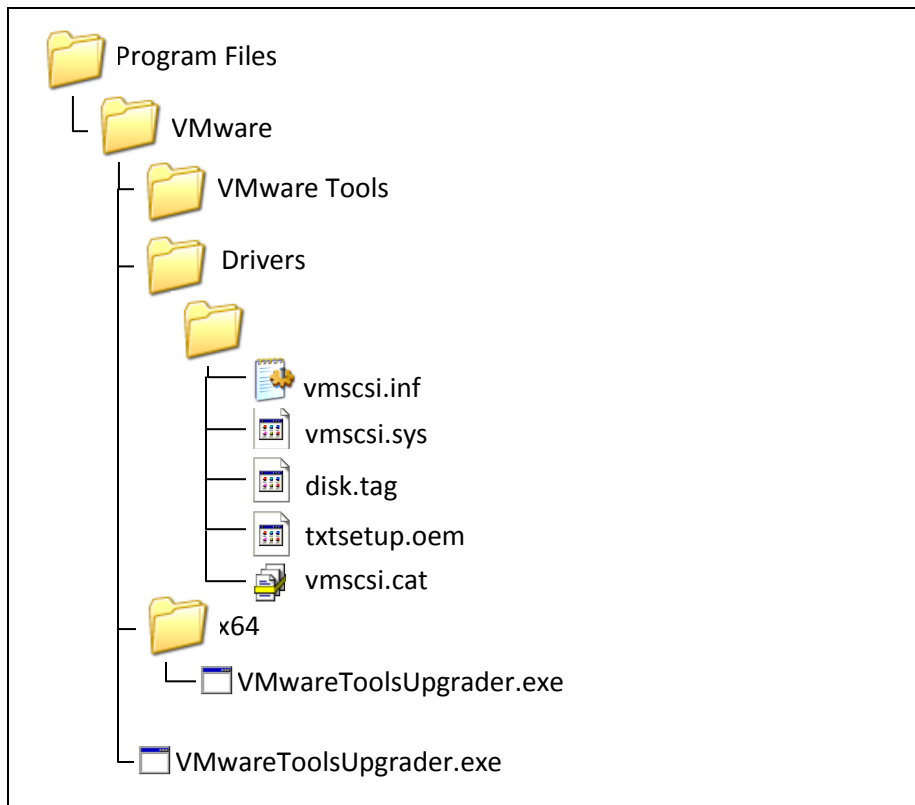
The module/package names which are provided in Table1 are all case sensitive! Specifying a wrong package/module will cause the installation procedure to abort with an error.

Preparation:

Required for an unattended installation of the VMware tools using msiexec is that the following ZIP archives can be in the same location as the "VMware Tools.msi":
- Common.zip
- GuestSDK.zip
- Micros~1.zip
- Sync.zip
- VMXNET3.zip
- WYSE.zip

Not all ZIP archives are mandatory, for example, if the Guest SDK will not be installed the ZIP archive will also be obsolete.
Additional to the ZIP files the "Program Files" Folder from the "VMware Tools.iso" is also needed to be the same location as the installer file. This directory is especially needed for VMware Tools updates but also for a fresh installation.

```
📁 Program Files
 └── 📁 VMware
      ├── 📁 VMware Tools
      ├── 📁 Drivers
      │    └── 📁
      │         ├── 📄 vmscsi.inf
      │         ├── 📄 vmscsi.sys
      │         ├── 📄 disk.tag
      │         ├── 📄 txtsetup.oem
      │         └── 📄 vmscsi.cat
      ├── 📁 x64
      │    └── 🪟 VMwareToolsUpgrader.exe
      └── 🪟 VMwareToolsUpgrader.exe
```

Picture1: Folder structure of "Program Files"

In *Picture 1* the structure of the "Program Files" folder is shown. It is highly important that the whole "Program Files" folder is accessible for the "VMware Tools.msi" package. It must be in the same location where the MSI also resides. This reflects **NOT** the "Program Files" folder from Windows! It is a separate folder which can be found on the "VMware Tools" CD-Rom or in the "VMware Tools.iso".

This table should give a short overview which options are available with VMware tools (vSphere and beyond).

Installation options 4.0	MSI parameter Name	Comment
Toolbox	**ToolsCore**	required
Memory Control Driver	**MemCtl**	required
SCSI Driver	**Buslogic**	required
Paravirtual SCSI	**PVSCSI**	not required
SVGA Driver	**SVGA**	required
Mouse Driver	**Mouse**	required
VMXNet NIC Driver	**VMXNet**	required
VMXNet 3 NIC Driver	**VMXNet3**	not required
Filesystem Sync Driver	**sync**	required
Descheduled-Time-Accounting	**vmdesched**	not required
Volume Shadow Copy Services Support	**VSS**	not required
Shared Folders	**Hgfs**	not required
Guest SDK	**GuestSDK**	not required
Wyse Multimedia Support	**WYSE**	not required
Audio Driver	**Audio**	not required
VMCI Driver	**VMCI**	required
WMI Performance Logging	**Debug**	not required
VAssert SDK	**VAssertSDK**	not required
VMCF SDK	**VICFSDK**	not required
Thin Print driver	**ThinPrint**	not required

Table1: VMware Tools module names

➔ *Tip:For more information about the MSI install options, please refer to Appendix A at the end of this document*

Fresh installation of VMware Tools:

To install VMware Tools on a Windows System (make sure to use the right MSI image fitting the Windows Version) the msiexec tool in Windows is needed.
It is the standard Windows installer and uninstaller tool.
This command will use the tool to install VMware Tools in unattended mode:

msiexec /i "VMware Tools.msi" ADDLOCAL=ALL
REMOVE="Hgfs,WYSE,GuestSDK,vmdesched" /qn /l* C:\temp\toolsinst.log /norestart

> → *Tip: For 64 Bit installations the name of the VMware Tools MSI is "VMware Tools64.msi"*

 The options specified are all needed for controlling what has to be installed and how the process should work. Also suppressing the automatic reboot of the system after the successful installation is set. Here is a short explanation of the options used:

- /i   Installation of a given MSI file
- ADDLOCAL=ALL   Install all packages/modules of the software
- REMOVE=".."   Exclude the provided packages/modules from Installation
- /qn   Quiet installation; no GUI
- /l* <PathToFile>   Log information to provided log file
- /norestart   Suppress OS reboot

For more information about msiexec parameters type "msiexec" in the Windows CMD or in "Start->Run…"

This command line will install VMware Tools in silent mode with all options except the following:

- Shared Folders (Hgfs)
- WYSE Multimedia Support (WYSE)
- Guest Software Development Kit(GuestSDK)
- VMware Descheduled Accounting Service (vmdesched)

The installation can be verified by checking the log file. If everything worked as expected the last line of the log should be:
"Product: VMware Tools -- Configuration completed successfully."

Valentin Hamburger, Technical Account Manager
Version: 1.1

Update of VMware Tools:

If the VMware Tools package is already installed and needs to be updated, the command line must be slightly adjusted. If the same syntax is used as for the fresh installation, it will produce an error message stating that there is an older version of VMware Tools already installed which first needs to be removed. While this would also work, there is a more elegant way to update existing VMware Tools installations (and, for instance, preserve network settings):

msiexec /i "VMware Tools.msi" REINSTALL=ALL REINSTALLMODE=vomus /l* C:\temp\toolsinst.log /qn /norestart

The difference here is that only packages/modules which are already installed will be updated.

- REINSTALL=ALL   Makes sure that all previously selected
                            packages/modules are updated
- REINSTALLMODE=vomus   This option is highly important, since it is used to
                            force the installation of the new MSI

Also checking the log file will show if the update was successful. If everything worked as expected the last line of the log should be:
"Product: VMware Tools -- Configuration completed successfully."

Modify the VMware Tools installation:

It is also possible to modify a VMware Tools installation to additionally include modules/packages or remove them if they are not needed anymore.
It is required to use the VMware Tools MSI file with the exact same Build Number as the VMware Tools which are installed on the OS.

In this example the "Hgfs" option, better known as "Shared Folders" will be removed for security reasons.

msiexec /i "VMware Tools.msi" REMOVE="Hgfs" /l* C:\temp\toolsinst.log /qn /norestart

It is a bit the same like the install command, but without the "ADDLOCAL=ALL" option. This makes sure that only the "Hgfs" option is removed and other parts of the VMware Tools such as network, SCSI, etc... remain unchanged.

The same comes true if there is something to add to the VMware Tools installation. In this example the file system sync driver gets replaced by the VSS (Volume Shadow copy Services) option:

msiexec /i "VMware Tools.msi" ADDLOCAL="VSS" REMOVE="Sync"
/l* C:\temp\toolsinst.log /qn /norestart

With this command line both options are used at the same time, this means not that only VSS will be installed (only true if VMware Tools are already installed!). For this example it is necessary to remove the "Sync" option before the "VSS" package/module can be added. To reduce the overall processing this can be done with this single command line. If there is only one package/module to add, the ADDLOCAL option without any other option would accomplish this.
As mentioned before, a successful installation can be verified by checking the log file:
"Product: VMware Tools -- Configuration completed successfully."

Uninstalling VMware Tools:

It could sometimes be necessary to uninstall VMware Tools. This can also be done with msiexec, but it is a bit trickier than the installation.
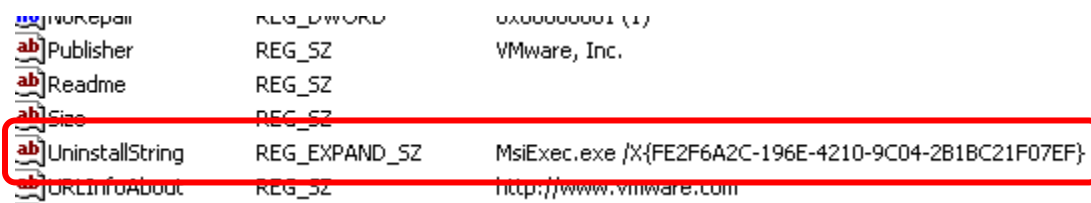The reason is that now the so called "UninstallString" is needed for a successful removal of the tools. This could be found within the Windows registry.
A search can be done in the following location within the registry:

HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall\

- Right click on "Uninstall" brings a popup menu where "Find" could be selected
- "VMware Tools" should be inserted at the "Find what:" text filed
- By clicking "Find Next" a page containing "VMware Tools" should be displayed in the right frame.

To uninstall the VMware Tools the value provided with the "UninstallString" is needed:

Picture1: UninstallString VMware Tools

The following syntax will uninstall the VMware Tools Software:

msiexec /X{FE2F6A2C-196E-4210-9C04-2B1BC21F07EF} /l* C:\temp\toolsrem.log /qn /norestart

- /X   Removes installed software

Another way to identify the "UninstallString" is to look at the VMware Tools installation log files. This string is included at the very end of the file.

SourcedirProduct = {FE2F6A2C-196E-4210-9C04-2B1BC21F07EF}

This prevents searching the Windows registry and could be automated by parsing the log file for this particular string.
If the uninstall procedure of VMware Tools was successful, the following line should be present in the log file:

"Product: VMware Tools – Removal completed successfully"

Appendix A

Package/Module description:

Toolbox

This is the core functionality of the VMware tools. It is absolutely required for installation.

Memory Control Driver:

The memory control driver aka. memctl is needed for the ballooning function which allows memory over commitment in ESX. If you want more information about ballooning please refer to:
http://www.vmware.com/pdf/esx3_memory.pdf

SCSI Driver

The SCSI driver is needed by the VM to interact with the VMDK (Virtual HDD / disk file).

Paravirtual SCSI

This is an enhanced version of the SCSI driver which speeds up the I/O to the VMDK. It is not a required feature but can significantly enhance the performance of a VM. For more information about paravirtualized SCSI please refer to:
http://www.vmware.com/pdf/vsp_4_pvscsi_perf.pdf

SVGA Driver

This represents the VMware display driver. It is needed for a better VGA resolution and to support the auto resize (Autofit Guest) function of the VM console.

Mouse Driver

A mouse driver, needed for mouse over support within the MKS

VMXNet NIC Driver

This represents the default driver for networking within a VM.

VMXNet3 NIC Driver

The advanced VMXNet3 Driver enables higher network throughput within a VM. For additional info please refer to the following VMware whitepaper:
http://www.vmware.com/pdf/vsp_4_vmxnet3_perf.pdf

Filesystem Sync Driver

This driver is needed for VMware Snapshots. Basically it takes care that no I/O is written during the snapshot file is created. This is important to get "crash consistent" snapshots. This option gets superseded by VSS!

Descheduled-Time-Accounting

This module of VMware Tools will be installed as additional Service in Windows VMs. It can improve the time synchronization for a Windows VM.
This service comes with limitations to work properly (only available for single vCPU VMs). For more information please refer to:
http://www.vmware.com/pdf/vi3_esx_vmdesched.pdf

Volume Shadow Copy Services Support

This is the VMware Tools support for Microsoft VSS within Windows. This extends the "crash consistency" of VMware snapshots since it uses the Windows Volume Shadow Copy functionality. The main difference between the file system sync driver and VSS is that VSS is also application aware.
For example, a SQL Server could be stopped making transactions during a VMware Snapshot which triggers a VSS event. Since VSS is superseding the file system sync driver both options must not be installed at the same time.

Shared Folders

This option is mostly used with VMware Workstation / VMware Fusion and should not be installed on an ESX / vSphere VM for security reasons.

Guest SDK

The "Guest Software Development Kit" - for additional information please refer to: http://www.vmware.com/support/developer/guest-sdk/

Wyse Multimedia Support

If you are using a WYSE thin client device to conduct remote desktop sessions using VMware View, installing WYSE Multimedia Support in the guest operating system improves the performance of streaming video. WYSE Multimedia Support allows streaming video to be decoded on the client rather than on the host, thereby conserving network bandwidth.
WYSE Multimedia Support is supported on the Windows 2003 and Windows XP guest operating systems only. WYSE Multimedia Support is installed as part of a VMware Tools installation or upgrade.

Audio Driver

This is the generic VMware audio driver. Some systems may not necessarily need this driver and it could be safely omitted.

VMCI Driver

The Virtual Machine Communication Interface (VMCI) is an infrastructure that provides fast and efficient communication between a virtual machine and the hypervisor or between two or more virtual machines on the same host. Installing the driver within the tools alone does not activate the functionality. For more Information about VMCI please refer to:
http://pubs.vmware.com/vmci-sdk/VMCI_intro.html
VMCI should be used in production in "restricted" mode. This prevents the VM form communicating with other VMs on the same host. Only change this if it is absolutely necessary. For more information about VMCI isolation please see also:
https://wiki.eng.vmware.com/VMCI/Isolation

VAssert SDK

VAssert allows inserting replay-only code into applications, incurring minimal performance overhead at runtime. After recording a virtual machine session, one can replay selected portions while performing data consistency checks and logging. For more information please refer to:
http://www.vmware.com/pdf/ws65_vassert_programming.pdf

VMCF SDK

Virtual Machine Communications Framework is experimental in vSphere and not supported for production. This framework will most likely change in the near future. It is not recommended to do any development with its current implementation. (Please refer to KB article **1010182** on the VMware Knowledge base)

Thin Print Module

This software can be used within VMware View desktops. It enables the use of a universal printing driver which also compresses print jobs before they get sent over the LAN/WAN.