

# **VIX\_VIRTUOZO\_SUITE DEPLOYMENT GUIDE**

**Release x86 January 2010**

**Support Thread: <http://communities.vmware.com/thread/191565?tstart=0>**

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## Overview

VIX\_Virtuozo\_Suite is a software suite designed to perform hot and cold backups of VMware Server 2.0, Workstation and ESXi guest hard disks (\*.vmdk) and configuration files (\*.vmx).

VIX\_Virtuozo\_Suite consists of three components:

### VIX\_Virtuozo\_Service

The windows service runs in the background and performs guest backups on a timed schedule specified by the user. By default, it is installed with the SYSTEM account and is left in the stopped state with Manual start up.

### *Debug and Status Messages*

Debug and status messages are written to the Windows Event Viewer. A custom event log, named 'Vix\_Virtuozo', is created on the machine running the service. If this event log fails to be created, the notifications are instead written to the Application event log. It is also possible to have the status messages sent via SMTP. Debug messages written to the event log consist of only three possible event IDs: 50, 100 and 200. Event ID 50 and 100 specifies a code flow / threading debug message and event ID 200 specifies a user debug message such as backup completions and failures.

### *Permission Requirements*

The service must be run under a domain user account to fulfill its network credential requirements of connecting to remote VMware hosts via SMB. The remote machine ACL must allow this user account specific permission sets as specified in the deployment section. Service start up state needs to be changed to Automatic.

### *Service Configuration*

Service configuration is stored in the Windows registry. Parameters stored in the registry include service options, schedules, host connection strings, usernames, encrypted passwords, absolute and CIFS source and destinations paths to configuration files and virtual hard disk files. This configuration is considered to be 'stale' in respect that it needs to be verified against the actual host configuration during the backup operation.

### *Backup Operation*

There are several stages during a typical host backup operation. First the host configuration is loaded from registry and validated against live host configuration. Upon successful validation an attempt is made to connect to the host via VIX. At this point, each guest configuration is validated in the same way. Guest validation requires that

the guest operating system is up and running for a short period of time to validate the guest hard disk files. During a cold backup, the guest is then powered down and all configured files copied to a backup location. During a hot backup, a snapshot is created to release the lock on the hard disk files, hard disk files are copied and the snapshot is committed back to the hard disk file. The guest is then either powered back on or left in an off state as specified by the user.

### *Multithreading*

The windows service is a multithreaded application, meaning that it can perform backup operations on multiple hosts and guests concurrently. These parameters are configured by the user as shown in the deployment section.

### VIX\_Virtuozo\_UI

The windows service backup operations and parameters are configured with the provided user interface described in detail in the deployment section.

### VIX\_Virtuozo\_Console

The console application is a stand alone application used to interface with local and remote VMware hosts.

### Vix\_Virtuozo\_Test

This application aids with troubleshooting.

### VIX\_Virtuozo\_Client

This tray application can be installed on any remote computer to monitor the backup status of the server.

## Limitations and Planned Features

### General Issues:

- ✓ VIX API COM existence is not verified on code start.
- ✓ VIX\_Virutozo\_Service is only supported on 32bit and 64bit Windows XP/7, Server 2003/2008.
- ✓ Workstation and ESXi interface is not supported.
- ✓ NasVolumes are not supported, only LocalDatastores are supported.
- ✓ Absolute VMDK filenames are not supported. All VMDK files must reside in the same location as the VMX configuration.
- ✓ Secondary VMDK files (vm\_1.vmdk, vm\_1-flat.vmdk) are not supported.
- ✓ Guests with existing snapshots are not supported.
- ✓ Shrink and defrag operations are not supported.
- ✓ CIFS destination available capacity is not verified prior to copy operations.
- ✓ Destination folders must exist in CIFS destinations.
- ✓ Event log OnEventWritten event is not implemented.
- ✓ Invalid registry settings cause early backup termination.
- ✓ Uninstall does not remove custom event log.
- ✓ Uninstall does not remove registry settings.
- ✓ Disk interface support is limited to IDE<0,1>:<0,1>, SCSI<0-3>:<0-15>
- ✓ When shutting down a host OS, VIX API throws an unmanaged exception
- ✓ User running service must have permission to add an event log
- ✓ Prevent service from stopping during backup (hang ups)
- ✓ Editing guest options/VMDKs during a hot backup shows snapshot VMDK path.
- ✓ Snapshotted guests display snapshot VMDK in Guest Options / Hard Disks instead of the base VMDK.
- ✓ Destination VMDK files are written over on every backup.
- ✓ Removing an invalid VMDK configuration does not populate disk tree view.
- ✓ VMFS file system is not supported.
- ✓ Reinstallation of application suite throws Error 1001: Service has been marked for deletion. All resources with VIX\_Virtuozo\_Service visibility must be closed.
- ✓ Service Dies during copy if Windows Error 64.

### Windows Server 2003(a)/2008(b) issues:

- ✓ (b) UI must be 'Run As...' to make changes (UAC).
- ✓ Host password are invalidated on config export.
- ✓ (b) Hard Disks tree view size is not correct when selecting disks.
- ✓ (b) EventLog.EnableRaisingEvents = True w/o callback throws exception.
- ✓ (b) Service shuts down when GUI is open, close GUI prior to backup operation.
- ✓ Swapping USB devices without using the "Remove Safely" feature might cause backup to fail next time it is run.
- ✓ Changing a guest to Cold Backup from Hot Backup after a failed backup will not work because the disk is considered invalid. The snapshot of the failed guest needs to be manually removed.

#### VIX SDK 1.6.2 Issues:

- ✓ Backup operation does not finish when host threads option is > 1.  
<http://communities.vmware.com/thread/196429?tstart=0>

#### VIX SDK 1.7/1.8 Issues:

- ✓ Maximum simultaneous host threads is 10.
- ✓ VIX 1.7 is not supported. Too many VIX lib crashes. Reverted back to VIX 1.6.2.

#### User Requested Features:

- ✓ Resizing of UI windows, including minimizing.
- ✓ Better backup notification. Another window to show activities and events.
- ✓ Backup the VM in the current state at backup time. If VM is running do hot backup, when VM is down do a cold backup.
- ✓ Easier access to service options.
- ✓ Enhanced backup schedule.
- ✓ Clicking Save would have the same effect as restarting service.
- ✓ Do XEN backups.
- ✓ Web admin module to provision VMware and XEN machines.
- ✓ Create destination sub folders if they do not exist.

#### Further Testing:

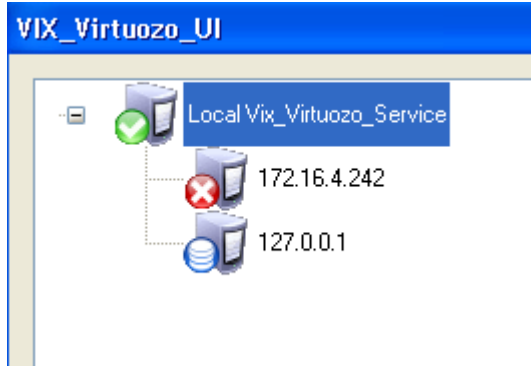
- ✓ Shutting down guest while backup in progress.

## Deployment

### Requirements

- ✓ Windows XP / Windows Server 2003/2008, 32bit or 64bit
- ✓ .NET Framework 3.5
- ✓ VIX API 1.6.2 must be installed.
- ✓ VIX\_Virtuozo\_Service must run under a domain user account
  - Host SMB Read access
  - Backup destination Read/Write access
  - Create custom Event Log
- ✓ Remote VMware Host OS
  - Windows
  - Linux
    - SAMBA
- ✓ It is recommended that each guest has VMware Tools installed

## UI Configuration



The start-up user interface contains context menus for each node level in the tree view. The icons next to each item specify the state of that item.

### *Service Configuration*

Service States:



Service is not running or is not installed.

Service is running.

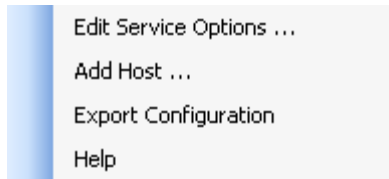
Service state can be modified by right-clicking on the top node in the tree view and selecting the appropriate menu item:



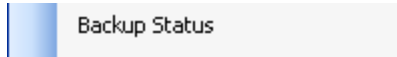
When closing the UI, you will be prompted to restart the service. This will ensure that the service obtains the latest configuration from the registry.

Other available service options include:





'Add Host' menu item will allow the user to add a new host to the backup schedule. Each host is added by their IP address. Host names are not allowed per limitation in the VIX API. Each newly added host has their ignore flag set by default.



'Backup Status' menu item displays the status of the last backup operation in real-time.

Backup Status				
File	% Compl...	Started	Finished	Last Error
172.16.2.2[standard] windows server 2003 standard edition.vmx\windows server 2003 r2.vmdk (18.84 gb)	100 %	2/10/2009 1:02:00 ...	2/10/2009 1:42:13 ...	0

'Edit Service Options' menu item will bring up the configurable parameters for the local service:

**Local Service Options**

**Notification Options**

Send Status Email

SMTP: 172.16.0.2

From: from@tempco.com

To: to@tempco.com

Write to Eventlog [Remove Custom Log](#)

Debug

**Performance Options**

Host Threads: 2

Guest Threads: 1

**VMDK\Schedule Options**

Daily Start Time: 09:40

Shrink on First Saturday

Defrag on First Saturday

**Run Process Before Backup**

c:\temp\createFolders.bat

OK Cancel

SMTP Notification are supported.

Since this release is only capable of processing debug messages, both the 'Write to Eventlog' and 'Debug' boxes must be checked if the user wishes to see any backup operation status in the event log.

As mentioned earlier, the windows service is a multithreaded application capable of processing multiple hosts and guests concurrently. 'Host Threads' specifies the maximum number of hosts to be processed concurrently. 'Guest Threads' specifies the maximum number of guests per each host to be processed concurrently.

'Run Process Before Backup' takes a path to a batch file that you want to execute prior to the backup process. If you wish to pass arguments, encapsulate them inside the

batch file. Of course process execution is limited to the Windows Service user's credentials.

'Daily Start Time' specifies the time to kick off the backup. Right now, the backup only runs Monday through Friday. Every time the kick off time is changed, the Virtuozo Windows Service must be restarted.

## Host Configuration

Host States:



Host state is unknown.

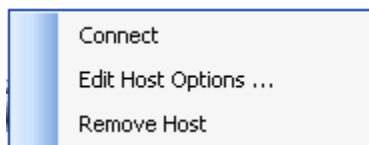


Disconnected from host.



Connected to host.

Host configuration can be modified by right-clicking on the host node:



'Remove Host' menu item will remove the selected host from backup configuration.

'Edit Host Options' menu item will bring up the configurable parameters for the selected host:

'Conn String' is the path that VIX API will use to connect to the host.

'User'/'Password' is the credential combination used to connect to the host. The stored password is encrypted in the registry configuration.

There are two XML configuration files used by the host: 'datastores.xml' and 'vminventory.xml'. Specify the path, including the XML filename.

Windows XP and Server 2003

- ✓ 'C:\Documents and Settings\All Users\Application Data\VMware\VMware Server\hostd'

Windows Server 2008

- ✓ 'C:\ProgramData\VMware\VMware Server\hostd'

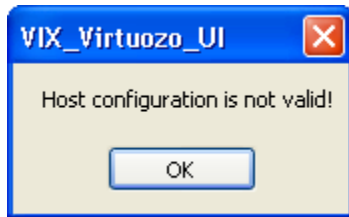
Linux

- ✓ '/etc/vmware/hostd/'

'Ignore' determines whether this host is omitted from any backup operations.

'Test' button will try to connect to the host VIX interface using the credentials provided.

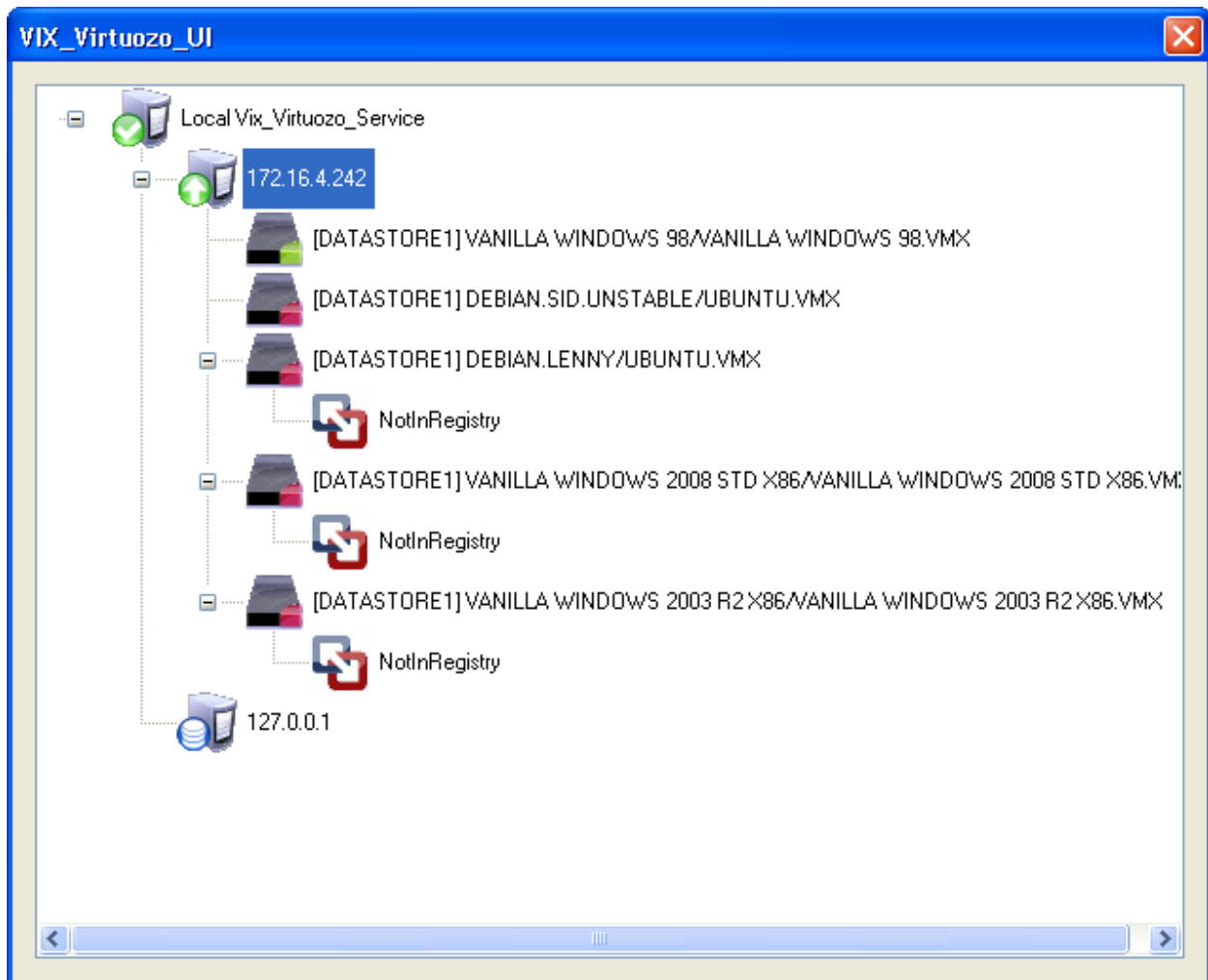
A newly added host or a misconfigured host will display this message:



There are several reasons why a host can be misconfigured:

1. SMB (CIFS) connectivity is down
2. *datastores.xml* CIFS location is not valid
3. *vminventory.xml* CIFS location is not valid
4. username/password combination is not valid

'Connect' menu item will attempt to retrieve and validate the guest configurations:



## Guest Configuration

### Guest States:



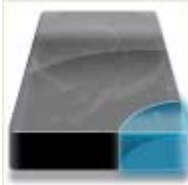
Guest is powered down.



Guest is powered on.



Guest configuration is invalid.



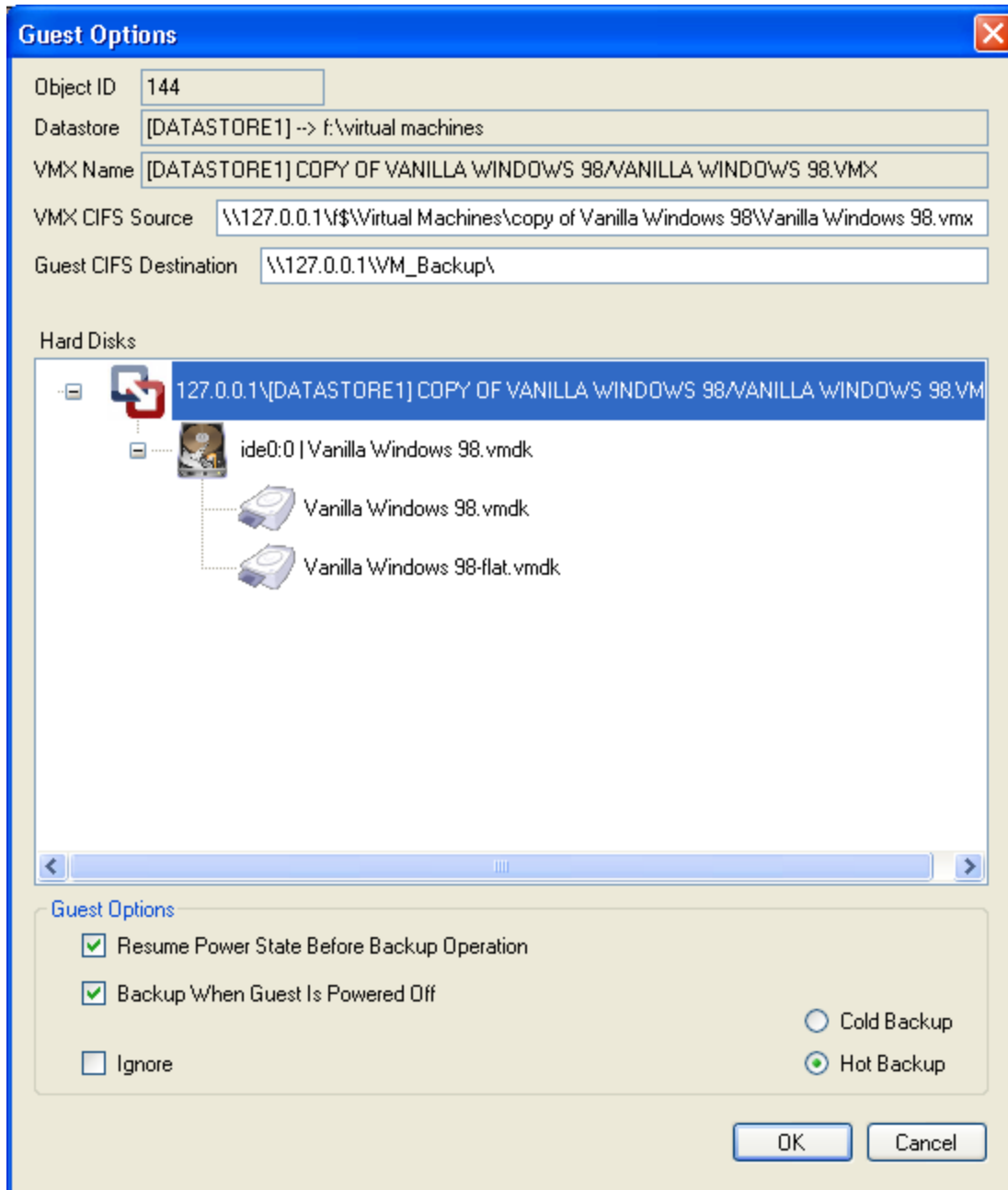
Guest configuration is invalid.



Information message regarding the guest configuration:

- ✓ NotInInventory
- ✓ NotInRegistry
- ✓ Invalid
- ✓ Unknown

The guest must be powered on before any settings can be modified. Right-clicking on a powered down guest will bring up the option to power on the guest. Right-clicking on an invalid guest will bring up the option to remove that guest from the backup configuration. Right-clicking on a powered on guest will bring up the option to edit its configuration.



'VMX CIFS Source' is the CIFS path to the VMX configuration file.

'Guest CIFS Destination' is the CIFS directory path to the backup location for all guest files.

'Resume Power State Before Backup Operation' will ensure that the guest is returned to the power state prior to the backup operation. If left unchecked, the guest will be powered on after each backup operation.

'Ignore' determines whether the guest is omitted from any backup operations.



'Backup When Guest Is Powered Off' will ensure that the guest files are backed up even if the guest is powered down. This feature requires that the guest be powered on for a short time to retrieve all necessary configuration.

**During the backup of a guest that is not running, Vix\_Virtuozo\_Service will power on the guest to retrieve disk configuration. The guest is then powered off in a cold backup scenario or left powered on in a hot backup scenario. At the end of the backup the guest is powered off if 'Resume Power State Before Backup Operation' is checked, otherwise it is brought to a powered on state.**

The hard disks tree view lists any disks found in the configuration.

Disk States:



Disk is misconfigured.



Disk is configured.



Information message regarding the disk configuration:

- ✓ NotInInventory
- ✓ NotInRegistry
- ✓ Invalid
- ✓ Unknown

Selecting a hard disk displays its configurable options:

**VMDK Options**

Bus:

Descriptor Filename:  Disk Type:

VMDK CIFS Source Dir:   
 Ignore

'VMDK CIFS Source Dir' is the CIFS directory path to the disk location.

'Disk Type' describes the storage architecture ([sanbarrow.com/vmdk/disktypes.html](http://sanbarrow.com/vmdk/disktypes.html)).

'Ignore' determines whether the disk files are omitted from any backup operations.

'Remove' button removes any invalid disks from backup configuration.

'Update' saves the user defined options for the selected disk.

## Host Configuration Considerations

- ✓ Domain user account used to run the windows service should also be used to access the remote hosts for the purpose of simplicity. This account must also have specific permissions; this can be circumvented by adding the user to BUILTIN/Administrators.
- ✓ Map two shares on the host 'vmConfig' pointing to 'C:\Documents and Settings\All Users\Application Data\VMware\VMware Server\hostd' and 'vmDatastoreX' pointing to the NTFS location of each datastore. Read and Write permissions must be set on both share and NTFS security.
- ✓ Troubleshooting remote access to WMI might involve any of the following on the remote host: enabling Remote Administration on Windows firewall, setting DCOM and Windows Management Instrumentation components permissions, as well as adding the domain user to the BUILTIN/Administrators group.
- ✓ Troubleshooting network connectivity might involve adding the domain user as well as the computer name running the windows service to 'Allow access to this computer from network' (LogonType 3) in the group policy.
- ✓ SAMBA for Linux: <http://www.debianhelp.co.uk/samba.htm>, <http://us6.samba.org/samba/>
- ✓ Configure Server 2.0 on Debian: [http://www.howtoforge.com/debian\\_etch\\_vmware\\_server\\_howto](http://www.howtoforge.com/debian_etch_vmware_server_howto)