



Host Specific Recommendations

VMware

1. CAUTION: VMware KB Article 51306: VMware has identified a problem with RHEL5 (GA), RHEL4 U4, RHEL4 U3, SLES10 (GA), and SLES9 SP3 guest operating systems. Their file systems may become read-only in the event of busy I/O retry or path failover of the ESX Server's SAN or iSCSI storage. Because of this known issue, HP recommends to pay attention at the usage of RHEL5 (GA), RHEL4 U4, RHEL4 U3, SLES10 (GA), and SLES9 SP3 as guest operating systems for Virtual Machines on VMware ESX Servers
2. CAUTION: The use of the N-Port ID Virtualization (NPIV) feature introduced with VMware ESX 3.5-4.0, allowing Virtual Ports/WWNs to be assigned to individual Virtual Machines, is not recommended and not supported with HP 3PAR InForm OS.
3. To avoid possible issues described in VMware KB #2007427 and 2014849, automatic VAAI Thin Provisioning Block Space Reclamation (UNMAP) should be disabled on ESXi 5.0 GA.
4. - With ESX 4.0 onwards, VMware supports a round robin I/O path policy for Active/Active storage arrays such as HP's 3PAR InServ Storage Server. Active/Active round robin I/O path policy is the preferred configuration for ESX 4.x.
 - **Do not use MRU (Most Recent Used).**
 - * Refer to the ESX 3.x - 4.x Implementation Guide for details.
5. If you are using SRA/SRM, please check VMware documentations for compatibility with the new InForm OS version to be installed.
6. To avoid overwhelming a target port and ensure continuous I/O operations, observe the following limitations on a target port:
 - Maximum of 32 host server ports per HP 3PAR Storage System port for 4 and 8 GBPS

Windows 2008 and 2012

1. For Windows 2008 that are using the Microsoft native MPIO driver, it is required the load-balancing policy be set to "Round-Robin".

The procedure for checking or changing load-balancing policy can be found at <http://technet.microsoft.com/en-us/library/ee619752%28WS.10%29.aspx>

See section "To configure the load-balancing policy setting for a LUN"

2. For Windows Server 2008 using MS MPIO or Windows 2008 VM running on ESX using a HBA in pass-through mode or an iSCSI LUN, following Microsoft hotfixes must be applied before updating the HP 3PAR Storage System:

Windows 2008, SP1 and SP2 require KB968287 installed, to resolve issue with MPIO path failover.

Windows 2008, SP1, SP2, R2 and R2 SP1 require KB2406705 installed, to resolve issue with MPIO path failover.

Windows 2008, SP1, SP2, R2 and R2 SP1 require KB2522766 installed to resolve issue with MPIO path failover.

Windows 2008, SP1, SP2, R2 and R2 SP1 require KB2754704 installed to resolve issue with MPIO path failover

Windows 2008, SP1, SP2, R2 and R2 SP1 require KB2752538 installed to resolve issue with MPIO path failover

You must restart the computer after applying the above listed hotfix.

3. On the first Windows Server 2012 or Windows Server 2008 reboot following an HP 3PAR array firmware upgrade (whether a major upgrade or an MU update within the same release family), the Windows server will mark the HP 3PAR LUNs offline but the data remains intact.

This behavior is seen only in the following cases:

- HP 3PAR LUNs seen by Windows standalone servers.
- HP 3PAR LUNs that are used in Microsoft Failover Clustering which are not configured as shared storage on the Windows failover cluster.

This behavior (LUNs being marked offline) is not seen if HP 3PAR LUNs are configured as shared storage in a Microsoft Failover Cluster.

NOTE: When the HP 3PAR LUNs are marked offline, the Windows server administrator must follow these steps so that applications can access the HP 3PAR LUNs:

1. Click Computer Management—Disk Management.
2. Right-click each of the HP 3PAR LUNs.
3. Set the LUN online.

To prevent this issue, HP recommends the execution of Microsoft **KB2849097** on every Windows Server 2008/2012 host connected to a HP 3PAR array. This must be executed on a host at the following times:

- 1. Prior to performing a 3par OS upgrade.**
- 2. Each time new HP 3PAR LUNs are exported to a host.**

KB2849097 is a Microsoft PowerShell script designed to modify the Partmgr Attributes registry value that is located at

HKLM\System\CurrentControlSet\Enum\SCSI\<device>\<instance>\DeviceParameters\Partmgr.

The value is responsible for the state of HP 3PAR LUNs following an array firmware upgrade. The script sets the value to 0 essentially changing its policy to online.

NOTE: The following procedure will ensure proper execution of KB2849097, which will prevent the HP 3PAR LUNs from being marked offline when the Windows server is rebooted following an array firmware upgrade.

1. Windows Server 2008/2012 requires the PowerShell execution policy to be changed to RemoteSigned to allow execution of external scripts. This must be done before the script is executed. To change the PowerShell execution policy, open the PowerShell console and issue the following command:

`Set-ExecutionPolicy RemoteSigned`

You might be prompted to confirm this action by pressing y.

2. The next step is to save the script as a .ps1 file to a convenient location and execute it by issuing the following command in a PowerShell console window:

`C:\ps_script.ps1`

The above command assumes that the script has been saved to C: under the name ps_script.ps1.

3. The Administrator will then be prompted to provide a Vendor String, which is used to distinguish between different vendor types. The script will only modify those devices whose Vendor String matches the one that has been entered into the prompt.

Enter 3PAR in the prompt to allow the script to be executed on all HP 3PAR LUNs currently presented to the host as shown in the output below:

Enter Vendor String: 3PAR

4. The script will then iterate through all HP 3PAR LUNs currently present on the host and set the Attributes registry value to 0. In order to verify that the Attributes value for all HP 3PAR LUNs were properly modified, issue the following command:

*`Get-ItemProperty -path "HKLM:\SYSTEM\CurrentControlSet\Enum\SCSI\Disk*Ven_3PARdata**\Device Parameters\Partmgr" -Name Attributes`*

The Attributes value should be set to 0 as shown in the example below:

```
PSPath :
Microsoft.PowerShell.Core\Registry::HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\
Enum\SCSI\Disk&Ven_3PARdata&Prod_VV\5&381f35e2&0&00014f\Device Parameters\Partmgr
PSParentPath :
Microsoft.PowerShell.Core\Registry::HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\
Enum\SCSI\Disk&Ven_3PARdata&Prod_VV\5&381f35e2&0&00014f\Device Parameters
PSChildName : Partmgr
PSDrive : HKLM
PSProvider : Microsoft.PowerShell.Core\Registry
Attributes : 0
```

RHEL

1. For the RedHat hosts, please ensure that the system is configured per the current 3PAR/HP Implementation Guide. It can be downloaded from:

<http://h20000.www2.hp.com/bizsupport/TechSupport/DocumentIndex.jsp?lang=en&cc=us&taskId=101&prodClassId=-1&contentType=SupportManual&docIndexId=64255&prodTypeId=18964&prodSeriesId=5044394>

We have seen a few instances where the multipath.conf file is not configured per the guide. This may cause incorrect detection of path removal during a node reboot or incorrect path failover.

2. The SCSI timeout needs to be set at 60 seconds in order for the InServ Storage Server to operate properly with RedHat servers. Use the following guidelines depending on your version of RedHat:

! RedHat 5—the SCSI timeout value is already set to the default value of 60 seconds and does NOT need to be changed.

! RedHat 4—the SCSI timeout value is 30 seconds and needs to be changed to 60 seconds.

WARNING: If not set to 60 seconds, the SCSI timeout will result in host disks being taken offline during InServ Storage Server rolling upgrades. Furthermore, Remote Copy requires the SCSI timeout value of 60 seconds, otherwise remote copy operations will become stale with a node reboot.

Please refer to the RHEL implementation guide for the instructions to set the timeout value.

VERITAS DMP

On all VERITAS DMP hosts, please make a temporary change to the DMP restore interval for the duration of the InServ OS upgrade, for VxDMP versions lower than what is specified in the 3PAR InForm OS Pre-Planning Guide provided to you. Below are the commands to use. This also does not apply to Windows 2003 and 2008.

```
vxddmpadm stat restored (note the current setting)
vxddmpadm stop restore (stop the daemon)
vxddmpadm start restore interval=1 (start the daemon with the new interval)
vxddmpadm stat restored (verify the setting is at 1).
cat: VxDMP_notes: No such file or directory.
```

NOTE: The following hosts do not require this change:

- AIX hosts using VERITAS VxDMP 5.0 with MP1 and HP 3PAR ODM 1.2 or later
- AIX hosts using VERITAS VxDMP 5.1 with HP 3PAR ODM for VERITAS 1.3 or later
- AIX hosts using VERITAS VxDMP 6.0 with HP 3PAR ODM for VERITAS 1.3 or later
- Linux hosts using VxDMP 5.1_GA or later
- Linux hosts using VERITAS VxDMP 6.0_GA or later
- Linux hosts using VERITAS VxDMP4.1 MP4
- Linux hosts using VERITAS VxDMP5.0 MP3 or later
- Solaris hosts using VERITAS VxDMP4.1 MP2 or later
- Solaris hosts using VERITAS VxDMP5.0 MP1 or later
- Solaris hosts using VERITAS VxDMP5.1_GA or later
- Solaris hosts using VERITAS 6.0_GA or later

Oracle RAC

- For 10gR1 10.1.0.x and 10gR2 10.2.0.1 (without bug 4896338 patched), set css miscount to 195 (# set css miscount=195).
- For 10gR1 10.1.0.x and 10gR2 10.2.0.1 (without bug 4896338 patched), set css miscount to 195 (# set css miscount=195).
- For 10gR2 10.2.0.1 (with bug 4896338 patched) and later, 11gR1, and 11gR2, css disktimeout must not be lowered from its default value of 200.
- For all Linux hosts with Oracle Clusterware, install and adjust Linux Hangcheck tick parameters to 30 seconds.
- Please ensure that the devices filed being used for Oracle DB (ie: inside ASM) are those that are handled by the multipath software (for instance use devices under /dev/mapper and exclude /dev/sdXX).

To avoid host IO disruptions during online firmware upgrades, redundant IO paths and multipath software should be employed. Refer to individual storage online firmware upgrade requirements. Path failovers during online firmware upgrades can increase IO latency to cluster disks (e.g. quorum, voting, and lock disks). Node evictions might occur if IO latency is greater than the time it takes for multipathing to failover to an active path. To avoid node evictions during online firmware upgrades configure cluster disk timeouts to a value greater than the time it takes for multipathing to failover to an active path. Refer to the cluster software vendor for more information on path failover times. Oracle RAC timeout values are detailed in Oracle support bulletin ID 294430.1
For EVA firmware upgrades, configure the cluster disk timeout to a value greater than the maximum latency as described in EVA documentation.

Full document (Oracle Application Notes) is available at:

http://h20272.www2.hp.com/utility/document.aspx?docurl=Shared%20Documents/an/solutions_oracle/third_party_application_note_2012_05_04.pdf

Sun Solaris

1. Please ensure that Solaris host matches the minimum patch requirements for various versions of Solaris and other associated drivers as listed in the Solaris Implementation guide available at:

<http://h20000.www2.hp.com/bizsupport/TechSupport/DocumentIndex.jsp?lang=en&cc=us&taskId=101&prodClassId=-1&contentType=SupportManual&docIndexId=64255&prodTypeId=18964&prodSeriesId=5044394>

2. Solaris using VxDMP 5.0MP3 RP1HF3: dmp_fast_recovery turned off as a minimum. However, 5.0MP3 RP2HF1 does not require this tunable turned off.

3. Solaris 10 MU3 with an iSCSI configuration is not supported for online updates.

4. For OS upgrades where a Solaris host is down, SPARC boxes are shutdown to the OK prompt, not totally powered off like x86 systems. This leaves the FC link up and will cause an upgrade revert during standard upgrades. The SPARC server must be completely powered off, or the FC connection physically disconnected.

Reminder for host Persona

ESX 3.5 is not supported in HP 3PAR OS 3.1.1 or later. ESX 5.1 is supported in HP 3PAR OS 3.1.1 MU1 or later.

To change the host persona of a host:

```
cli% sethost -persona <persona_number> <host_name>
```

To verify the host persona setting of a host:

```
cli% showhost persona <host_name>
```

NOTE: If a host server is powered down during an upgrade from HP 3PAR OS 2.2.x to HP 3PAR OS 2.3.1, OS 3.1.1, or OS 3.1.2, the recommended host persona for the type of host that is down should apply, as the upgrade assigns host persona 6 to the server. In some cases, it would prevent the host from operating correctly, as is the case with HP-UX, AIX, and NetApp.

Hosts with incorrect persona may lead to degraded performance. We recommend you to set the persona as per the following table if not already done.

Operating System	Persona at 2.3.1/3.1.1	Persona 3.1.2	Notes
Red Hat 4 and 5, SUSE 10 and 11 - Fibre channel and iSCSI (Except SUSE 11 iSCSI, which should be left at Persona 6)	6	1	Use of generic persona allows the host server to run "Host Explorer" on the host. It will automatically create LUN 254 as a SCSI enclosure device for Host Explorer use.
W2k3 including iSCSI	6	1	
Solaris (except Solaris 8), including iSCSI	6	1	
W2k8 SP1 and SP2 and Solaris 8 or Solaris 11, including iSCSI	6	2	Enabling host persona 2 will enable A/A multipath on LUNs by default – This change will require a reboot. <i>Do not</i> change the host persona unless you can reboot the W2k8 server. If you do not reboot the server, the host will lose the mapping of the LUNs.
W2k8 R2 including iSCSI for HP 3PAR OS 3.1.1 or earlier	6	1	Microsoft enables A/A multipathing by default at Windows Server 2008 R2,
W2k8 R2 including iSCSI for HP 3PAR OS 3.1.2	6	2	For Windows Server 2008 R2, configurations of persona 6 and 1 need to be changed manually to persona 2 after an upgrade to HP 3PAR OS 3.1.2. However, it's not mandatory. The Windows Server host need to be shut down when the persona change is performed and then brought back online in order to properly configure the ALUA paths support in persona 2.
VMware (3.5, 4.0, 5.0 for HP 3PAR OS 3.1.1 or earlier ¹)	6	6	For VMware 4.0 only change the SATP rules on host to enable Active/Active Round Robin by default. See the <i>HP 3PAR VMware ESX Implementation Guide</i> for instructions about changing the ESX 4.0 SATP rules.
VMware (4.0, 5.0, 5.1) for HP 3PAR OS 3.1.2	6	11	As of HP 3PAR OS 3.1.2, a second host persona, 11, which has asymmetric LUN unit access (ALUA), is available and is recommended for ESX systems. However, it's not mandatory. Changing the persona from 6 to 11 is an offline process in which you stop all host I/O, change the SATP rule to configure ALUA on the host, and then shut down the host. Perform the change to Persona 11 on the HP 3PAR StoreServ Storage and then bring the VMware host back online, where the LUNs will be ALUA-enabled. See the <i>HP 3PAR VMware ESX Implementation Guide</i> , which is available on the HP BSC website, for detailed instructions: http://www.hp.com/go/3par/

HP Insight Control for VMware vCenter

HP Insight Control for VMware vCenter Server does not support cluster provisioning operations for HP 3PAR Storage arrays running firmware 3.1.2 MU23PAR CLI Client Recommendation.

DESCRIPTION

After upgrading HP 3PAR Storage system firmware to version 3.1.2 MU2, HP Insight Control for VMware vCenter Server cluster provisioning operations result in unexpected changes to host definitions. When HP Insight Control for VMware vCenter Server presents a volume to a cluster of VMware ESX hosts, the WWNs from all host definitions are reassigned to the first host definition. The host definitions are then deleted for all other hosts in the cluster. The effect is that some volumes may no longer be visible to the other VMware ESX hosts. In a boot from a SAN situation, the other VMware ESX hosts may terminate unexpectedly when the boot volumes are not accessible.

SCOPE

This advisory applies to all installations of HP Insight Control for VMware vCenter Server plug-in where users have HP 3PAR Storage arrays running firmware 3.1.2 MU2.

RESOLUTION

This issue will be addressed with HP Insight Control for vCenter version 7.2.3, scheduled to release by the end of September 2013.

Workaround

Users should not perform provisioning operations on a VMware cluster from the HP Insight Control for VMware vCenter Server plug-in for any HP 3PAR Storage arrays with firmware 3.1.2 MU2.

NOTE: Provisioning operations work correctly on individual servers not belonging to a cluster.

3PAR CLI Client Recommendation

- If you are running HP/3PAR software that uses 3PAR CLI, (ie: System Reporter, Cluster Extension Software), please ensure that you upgrade the CLI of the hosts to latest CLI client.

You can download the latest CLI and IMC at the following FTP dropbox:

ftp://imc_cli:ftp_3PAR@ftp.usa.hp.com/

For CLI, Go to 'CLI-SNMP->(choose the CLI installer for your OS)'

For IMC, go to IMC folder

Please ensure that any 3rd party software that may be related to the InServ is supported with the new InForm OS version to be installed.

All hosts need to be configured to the applicable Implementation Guide from:

<http://h20000.www2.hp.com/bizsupport/TechSupport/DocumentIndex.jsp?lang=en&cc=us&taskId=101&prodClassId=-1&contentType=SupportManual&docIndexId=64255&prodTypeId=18964&prodSeriesId=5044394>

During the upgrade there should be no changes to environment of the SAN and hosts. There should be no host reboot, and no tuning task running on the InServ. General host configuration and InServ configuration guidelines NEED to be followed for an online InForm OS update. These are explained in the OS Update Pre-Planning Guide.

Array Specific Recommendations

A) Please review the compatibility of HP-3PAR host based software and update if required:

http://h20272.www2.hp.com/Pages/spock2Html.aspx?htmlFile=sw_array_3par.html

To download 3par software (e.g. System Reporter), please visit the following HP url:

<http://www.hp.com/go/hpsoftwareupdatesupport>

If you have any difficulties in obtaining the above listed software, please open a case with HP support:
3par-call-center@hp.com

You will be required to create a HP Passport login account and provide the contractual support agreement (SAID).

B) If the target OS is 3.1.1.GA/3.1.1.MU1 – Please run the below command from InServ CLI and provide us the output: `showrsv -l scsi3`

C) Stop AO, DO, RC tasks before the upgrade

All system administration activities must be stopped during an InForm OS online update. All active tasks must complete or be stopped before proceeding. This includes any provisioning activity, physical/virtual copy activity, and dynamic optimization. Be sure to stop any automated administration scripts that may be running as well (Recovery Manager and VSS Provider for Microsoft Windows).

If this system is licensed for Adaptive Optimization (AO), please check if the Adaptive Optimization (AO) cycle is going to overlap with the OS upgrade window. If it will, please deactivate AO before OS upgrade window and reactivate once OS upgrade is complete.

To stop AO, please launch System Reporter, click on "Policy Settings" on top menu bar-->a new window pops-up-->Click on "Adaptive Optimization" tab-->click "Change" next to the InServ to be upgraded (you need to do it for all Polcy Ids) --> Change "Configuration Active " to False

To stop Remote Copy on both primary and DR sites:

`stoprcpygroup [option] <group_name>`

stoprcopy [options]

Stopping a Remote Copy group while the group is currently syncing will delay a return of the command.

To stop DO, please cancel all tune tasks (e.g. tunevv)

D) CPU idle time should be more than 50 % during the InForm OS upgrade. As one node in a node pair reboots at a time during the upgrade, the other node has to handle the entire load during that time. If a system is already running low on resources, we do not recommend performing an OS upgrade. Hence, we request you to schedule the OS upgrade during off peak hours.

Current CPU idle time can be verified by using the below command from 3PAR CLI:

statcpu -t -d 15 -iter 1

E) The I/O load limit recommended for host ports during OS upgrade is as shown below. Hence, request you to schedule the OS upgrade during off peak hours

For each port, the average I/O, KBytes per sec, needs to be less than:

200,000 KBytes per sec, for 4 GB connections

400,000 KBytes per sec, for 8 GB connections

Avg I/O and KB/s on each port can be found using the below command from 3PAR CLI:

statport -d 15 -iter 1 -ni