

## Managing host I/O timeouts for an online upgrade

The defaults for host operating parameters, such as LUN timeout and queue depth, ensure proper operation with the array. These values are appropriate for most array operations, including online controller software upgrades. In general, host LUN timeouts of 60 seconds or more are sufficient for an online upgrade. In most situations you will not need to change these settings to perform an online controller software upgrade.

If any host timeout values have been changed to less than the default (typically 60 seconds), you must reset them to their original default. The following sections summarize the steps and commands for checking and changing timeout values for each supported operating system. See the operating system documentation for more information.

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- ⓘ **IMPORTANT:** Depending on your operating system, changing timeout values may require a reboot of your system. To minimize disruption of normal operations, schedule reboots one node at a time. In a cluster environment, plan your reboots one node at a time.
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### HP-UX

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- ⚠ **CAUTION:** Because HP-UX supports boot across Fibre Channel SAN, any change to default SCSI timeouts on the HP-UX host may cause corruption and make the system unrecoverable.
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#### Default timeout values

- Sdisk timeout: 30 seconds
- (LVM) lvol timeout: 0 seconds (default=0, retries forever)

## IBM AIX

### Checking or changing timeouts

AIX requires the disk settings shown in Table 6 (page 29) for the native multipath drives.

**Table 6 IBM AIX timeout settings**

Setting	Value	Description
PR_key_value	not applicable	Sets the key value for persistent reservations. Persistent reservations are not supported.
Algorithm	fail_over	Sets the load balancing algorithm to fail_over. All I/O uses a single path; the remaining paths are in standby mode. The value round_robin is not supported.
hcheck_interval	60	Sets the path health-check feature to check each device every 60 seconds.
hcheck_mode	nonactive	Specifies the I/O paths monitored by the path health-check feature. The value <i>nonactive</i> checks all I/O paths for Failed status, and checks standby paths for Used/Opened devices.
queue_depth	8	Sets the queue depth.
reserve_policy	single_path	Sets the reserve policy to standard SCSI-2 reservations.
rw_timeout	60	Sets the read/write timeout to 60 seconds.

## Linux Red Hat and SUSE

**NOTE:** The RHEL 4, RHEL 6, or SLES 9 SCSI device has a default 30-second timeout value with up to 5 retries. The RHEL 5, SLES 10, or SLES 11 SCSI device has a default 60-second timeout with up to 5 retries. In general, these timeout periods are sufficient for an online controller software upgrade.

### Native Linux Device-Mapper Multipath

If you are using Native Linux Device-Mapper Multipath, see the *Native Linux Device-Mapper Multipath for HP StorageWorks Disk Arrays reference guide* for additional configuration details. The document is located on the Single Point of Connectivity Knowledge website:

<http://www.hp.com/storage/spock>

In the left navigation pane, select **Solutions: Linux** under Application Notes.

### Configuration recommendations for driver vendor's multipathing

**Table 7 QLogic driver parameters**

Parameter	Failover enabled	Single path
qdepth	16	16
port_down_retry_count	30	64
login_retry_count	30	30
failover	1	0
load_balancing	1	1
excludemodel	0x0	0x0
auto_restore	0xA0	0xA0

**Table 8 Emulex driver parameters**

Parameter	Single path	With Multipulse
HPELXPFC	y	—
nodev_timeout	60	10
qdepth	30	16
discovery_threads	1	32

To check or set Linux parameters, use the `set_parm` executable located in the `/opt/hp/<driver>` directory. When executed, the options to change timeout values are displayed.

**NOTE:**

- You must increase timeout values for Emulex single path (without multipath support) and QLogic single path used in this environment. This is important for both online upgrades and general data integrity.
- Online controller software upgrades are supported with Linux boot devices.

## Mac OS X

Online controller software upgrades are not supported for arrays connected to Mac OS X hosts. Controller software upgrades must be done offline for Mac OS X hosts.

## Microsoft Windows

Guidelines for Microsoft Windows follow:

- Ensure that MPIO is installed and both paths are active and have access to the array.
- Array boot devices are supported with online controller software upgrades, but the page-file disk must not be on the array being upgraded during an online upgrade. See your Windows documentation for instructions on changing the location of the page-file disk.
- If the array being upgraded is used as a quorum disk in a Microsoft Windows cluster, an online controller software upgrade may cause the cluster to time out on the quorum disk and attempt to transition disks on that node to the surviving (secondary) node. The cluster may hang in this situation and require a cluster reboot to recover. A workaround is to transition all disks on the secondary node to the primary node, stop the cluster services, and shut down the secondary node before starting the controller software upgrade. Once the upgrade is complete, restart the cluster services and the secondary node to return it to the cluster.
- Shut down the secondary node to prevent automatic failover.

### Checking timeout values

Ensure that the key timeout setting in the registry at

`HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Disk\TimeoutValue` is set to 3c (60 seconds), the Microsoft Windows default.

If the registry entry does not exist, you must create it. See your Windows documentation for instructions.

If this registry entry is created or changed, reboot the Windows system for the new timeout value to take effect.

## OpenVMS

The maximum LUN timeout value is 120 seconds.

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**NOTE:** OpenVMS tolerates the controller reboot that occurs at the end of the controller software upgrade process. Disks on the controller display the Mount Verify status during the controller reboot but return to Mounted status and resume I/O operations when the controller reboot is complete. You do not need to change any OpenVMS default settings when performing an online controller software upgrade.

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Online controller software upgrades are supported in OpenVMS cluster environments where the array is the cluster boot device.

## Solaris

Solaris supports online controller software upgrades with the following driver timeouts:

- Sun drivers (qlc or emlxs): 60 seconds
- QLogic (qla2300): 60 seconds
- Emulex (lpfc): 60 seconds

### Checking or changing timeouts

For Sun drivers, add the following lines to the `/etc/system` file:

```
set sd:sd_io_time=60
```

```
set ssd:ssd_io_time=60
```

For the QLogic driver, edit the `/kernel/drv/qla2300.conf` file and change the `hba-link-down-timeout` value to 60:

```
hba0-link-down-timeout=60;
```

For the Emulex driver, edit the `/kernel/drv/lpfc.conf` file and change the `linkdown-tmo` value to 60:

```
linkdown-tmo=60;
```

## VMware

### VMware ESX (Hypervisor) timeouts

VMware ESX (Hypervisor) does not time I/O for a guest operating system. Therefore, the SCSI timeouts on commands issued by each VMware guest (Linux, Windows, Solaris) are the timeouts set for these systems.

### Using HP P6000 Command View on a Windows 2008 guest system on ESX 4.1 or 5

When using HP P6000 Command View on a Windows 2008 guest system on ESX 4.1 or 5, use one of the following methods to upgrade the firmware to ensure a successful upgrade, or your array code load will fail in a VMware Guest OS configuration:

- Array-based management module
- Physical server-based HP P6000 Command View
- Direct Path I/O mapping from ESX (requires supported hardware on the ESX server)

## Xen Citrix

For Xen Citrix, (except for NFS SR timeouts because Citrix XenServer 5.0 mounts using software with nondefault timeout values) use the values described in [“Linux Red Hat and SUSE” \(page 29\)](#).

To check or set Xen Citrix parameters, use the `set_parm` executable located in the

```
/opt/hp/<driver>
```

directory. When executed, the options to change timeout values are displayed.

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**NOTE:**

- You must increase timeout values for Emulex single path (without multipath support) and QLogic single path used in this environment. This is important for both online upgrades and general data integrity.
  - Online controller software upgrades are not supported with Xen Citrix boot devices.
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## Managing application I/O timeouts for an online upgrade

Applications are typically insulated from the online controller software upgrade by the operating system and HBA driver software. Consequently, if the application is running on a properly configured operating system, the online controller software upgrade will complete successfully. Evaluate any applications that have more stringent timeout requirements than the operating system to help determine if the applications will tolerate the online upgrade. Although an application may survive the online controller software upgrade successfully, there may be an impact on performance. To minimize the performance impact on users, perform the online upgrade during a period of low user activity.

## Managing external devices

During an XCS upgrade, if the array is being used as external storage (virtualized behind an HP P9000 XP array or in an SVSP configuration), you must set the I/O Timeout to 240 seconds on all applicable external paths. Additionally, the following resets are required, except for arrays in an SVSP configuration:

- Enable System Option Mode 725 on the XP array.
- Set the Path Blockade Watch Timer to 180 seconds on all applicable external paths.

Once the upgrade is complete, reset all parameters to their original values.

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- ⓘ **IMPORTANT:** Vraid0 LUNs on the XP array are not supported during an upgrade.
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