

Configuring the Queue Depth of the nfnic driver on ESXi 6.7 for use with VMWare VVOL

Contents

[Introduction](#)

[Background Information](#)

[Checking and Updating the nfnic Driver](#)

[Checking installed driver](#)

[Upgrading the nfnic driver](#)

[Configuring the nfnic Driver](#)

[Configuring the Queue Depth Parameter](#)

[Configure the outstanding IO on the Protocol Endpoint](#)

Introduction

This document describes the process of configuring the maximum Queue Depth and the Outstanding Input/Output (IO) on a native fiberchannel network interface card (nfnic) driver. In the VMware ESXi 6.7 hypervisor, the fiberchannel network interface card (fnic) driver was replaced with the nfnic driver for all Cisco adapters.

The default queue depth of the nfnic driver is set to 32 and on all initial releases of the nfnic driver there is no way to adjust the nfnic queue depth. This limits all Maximum Device Queue Depths and Disk Schedule Number Requests Outstanding to 32. It has also caused issues while using vSphere Virtual Volumes since the recommended queue depth is 128. The effects of this limit can also be seen on any VMs that experience a higher workload and require a larger queue depth in general.

Contributed to by Michael Baba, Josh Good and Alejandro Marino; Cisco TAC Engineers.

Background Information

Enhancement created to add ability to configure queue depth parameter:

<https://bst.cloudapps.cisco.com/bugsearch/bug/CSCvo09082>

Starting with version 4.0.0.35 of the nfnic driver, you can adjust the "lun_queue_depth_per_path" via the ESXi Command Line Interface (CLI). This driver version can be manually installed to the ESXi host if it is not already on it.

The nfnic driver 4.0.0.35 can be found in the UCS Blade Firmware bundle 4.0.4 and can also be downloaded separately from VMware. You should refer to the [UCS Hardware and Software Compatibility](#) page to get the latest recommended driver for your specific hardware and software combination.

Checking and Updating the nfnic Driver

Checking installed driver

To check the currently installed version of the nfnic driver, run:

```
esxcli software vib list | grep nfnic
```

You should see something like:

```
[root@localhost:~] esxcli software vib list | grep nfnic
nfnic                4.0.0.14-1OEM.670.1.28.10302608      Cisco
VMwareCertified     2019-08-24
[root@localhost:~]
```

If you do not see any output, then you currently do not have the nfnic driver installed. Please refer to the [UCS Hardware and Software Compatibility](#) page to check if your configuration should be using the nfnic or fnic driver.

Upgrading the nfnic driver

Detailed instructions to install the latest drivers are beyond the scope of this guide. Please refer to [UCS Driver Installation for Common Operating Systems](#) or VMware's documentation for step-by-step instructions to upgrade the driver. Once the driver is upgraded you can use the same commands above to verify the version.

Configuring the nfnic Driver

Configuring the Queue Depth Parameter

Once the correct driver is installed we can check that the module parameters are available to configure with:

```
[root@localhost:~] esxcli software vib list | grep nfnic
nfnic                4.0.0.14-1OEM.670.1.28.10302608      Cisco
VMwareCertified     2019-08-24
[root@localhost:~]
```

We can see in this output that the default value is set to 32, however, we can configure any value from 1-1024. If using vSphere Virtual Volumes, it is recommended to set this value to 128. We would recommend to reach out to VMware and your storage vendor for any other specific recommendations.

Sample Output:

```
[root@localhost:~] esxcli system module parameters list -m nfnic
Name                Type  Value  Description
-----
lun_queue_depth_per_path  ulong          nfnic lun queue depth per path: Default = 32. Range [1 - 1024]
[root@localhost:~]
```



```
lun_queue_depth_per_path  ulong  128      nfnic lun queue depth per path: Default = 32. Range [1 - 1024]
```

```
[root@localhost:~]
```

An example with output. We can see that the "Device Max Queue Depth:" and "No of outstanding IOs with competing worlds:" are both still 32.

```
[root@localhost:~] esxcli storage core device list -d naa.600a09803830462d803f4c6e68664e2d
naa.600a09803830462d803f4c6e68664e2d
```

```
  Display Name: VMWare_SAS_STG_01
  Has Settable Display Name: true
  Size: 2097152
  Device Type: Direct-Access
  Multipath Plugin: NMP
  Devfs Path: /vmfs/devices/disks/naa.600a09803830462d803f4c6e68664e2d
  Vendor: NETAPP
```

```
...snip for length...
```

```
  Is Boot Device: false
Device Max Queue Depth: 32
No of outstanding IOs with competing worlds: 32
  Drive Type: unknown
  RAID Level: unknown
  Number of Physical Drives: unknown
  Protection Enabled: false
  PI Activated: false
  PI Type: 0
  PI Protection Mask: NO PROTECTION
  Supported Guard Types: NO GUARD SUPPORT
  DIX Enabled: false
  DIX Guard Type: NO GUARD SUPPORT
  Emulated DIX/DIF Enabled: false
```

Now we change it to 128 for this device

```
[root@localhost:~] esxcli storage core device list -d naa.600a09803830462d803f4c6e68664e2d
naa.600a09803830462d803f4c6e68664e2d
```

```
  Display Name: VMWare_SAS_STG_01
  Has Settable Display Name: true
  Size: 2097152
  Device Type: Direct-Access
  Multipath Plugin: NMP
  Devfs Path: /vmfs/devices/disks/naa.600a09803830462d803f4c6e68664e2d
  Vendor: NETAPP
```

```
...snip for length...
```

```
  Is Boot Device: false
Device Max Queue Depth: 32
No of outstanding IOs with competing worlds: 32
  Drive Type: unknown
  RAID Level: unknown
  Number of Physical Drives: unknown
  Protection Enabled: false
  PI Activated: false
  PI Type: 0
  PI Protection Mask: NO PROTECTION
  Supported Guard Types: NO GUARD SUPPORT
  DIX Enabled: false
  DIX Guard Type: NO GUARD SUPPORT
  Emulated DIX/DIF Enabled: false
```

And when checking the same output we can see "Device Max Queue Depth:" and "No of

outstanding IOs with competing worlds:" are both now 128. If the changes are not immediately reflected then a reboot of the ESXi host may be needed.

```
[root@localhost:~] esxcli storage core device list -d naa.600a09803830462d803f4c6e68664e2d
naa.600a09803830462d803f4c6e68664e2d
  Display Name: VMWare_SAS_STG_01
  Has Settable Display Name: true
  Size: 2097152
  Device Type: Direct-Access
  Multipath Plugin: NMP
  Devfs Path: /vmfs/devices/disks/naa.600a09803830462d803f4c6e68664e2d
  Vendor: NETAPP
...snip for length...
  Is Boot Device: false
Device Max Queue Depth: 128
No of outstanding IOs with competing worlds: 128
  Drive Type: unknown
  RAID Level: unknown
  Number of Physical Drives: unknown
  Protection Enabled: false
  PI Activated: false
  PI Type: 0
  PI Protection Mask: NO PROTECTION
  Supported Guard Types: NO GUARD SUPPORT
  DIX Enabled: false
  DIX Guard Type: NO GUARD SUPPORT
  Emulated DIX/DIF Enabled: false
```