Pavilion HyperOS RDMA volumes with ESXi 7.0 Configuration Guide

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PAVILION HYPEROS RDMA VOLUMES WITH ESXI 7.0 CONFIGURATION GUIDE

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1. ABOUT THIS GUIDE

Pavilion HyperOS RDMA Volumes with ESXi 7.0 Configuration Guide, is intended for audience familiar with **VMware® vSphere™** client and **ESXi Shell**, so that the user can successfully manage vCenter server systems or standalone ESXi hosts.

This guide documents the information that assist the user to connect **Pavilion** RDMA volumes with **ESXi 7.0** using both **GUI** and **CLI**. **Pavilion** is certified for RDMA for ESXi 7.0

Pavilion Data vCenter plugin is a user friendly, browser-based tool. The plugin integrates with the **VMware® vSphere™** client, providing an alternative interface that allows you to monitor and manage **Pavilion NVMe-oF Storage Platform**

It is recommended that you see *Pavilion HyperOS vCenter Plugin Reference Guide* for more info.

1.1 PREREQUISITES

Prerequisites for connecting **Pavilion** NVMe over RDMA volumes with **ESXi 7.0** are:

- ✓ User has already created a **VMkernel** interface which has IP connectivity to the **Pavilion** dataport network.
- ✓ The **MTU** for the **vSwitch** and **VMkernel** connecting to **Pavilion** is set to **9000**.

2. CONFIGURING PAVILION RDMA VOLUME WITH ESXI 7.0 USING GUI

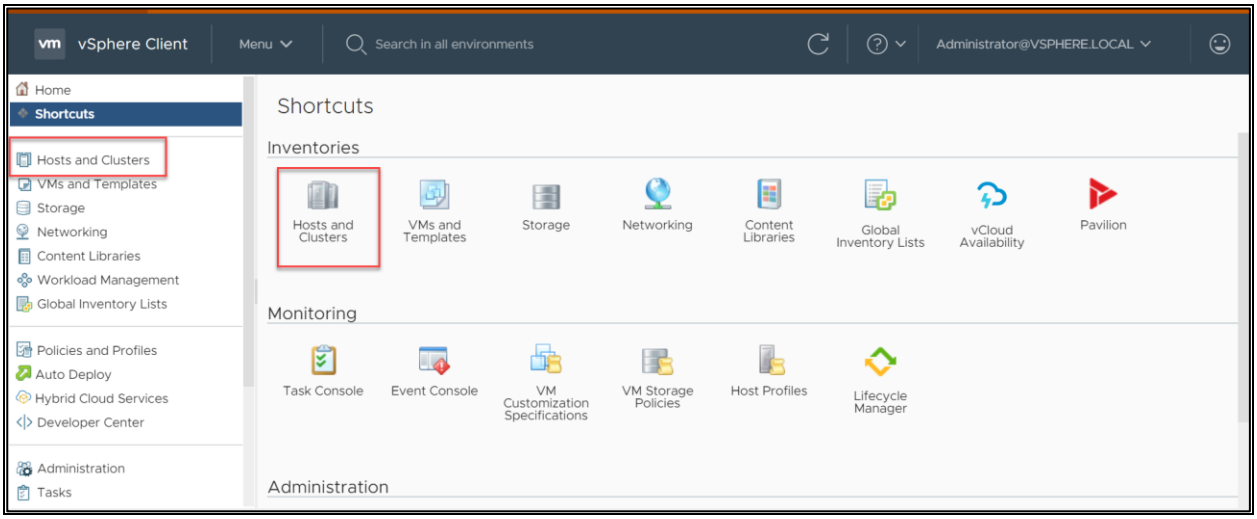
This section lists the steps required to configure Pavilion RDMA volume with ESXi 7.0 using GUI.

2.1 HOW TO ADD SOFTWARE ADAPTER

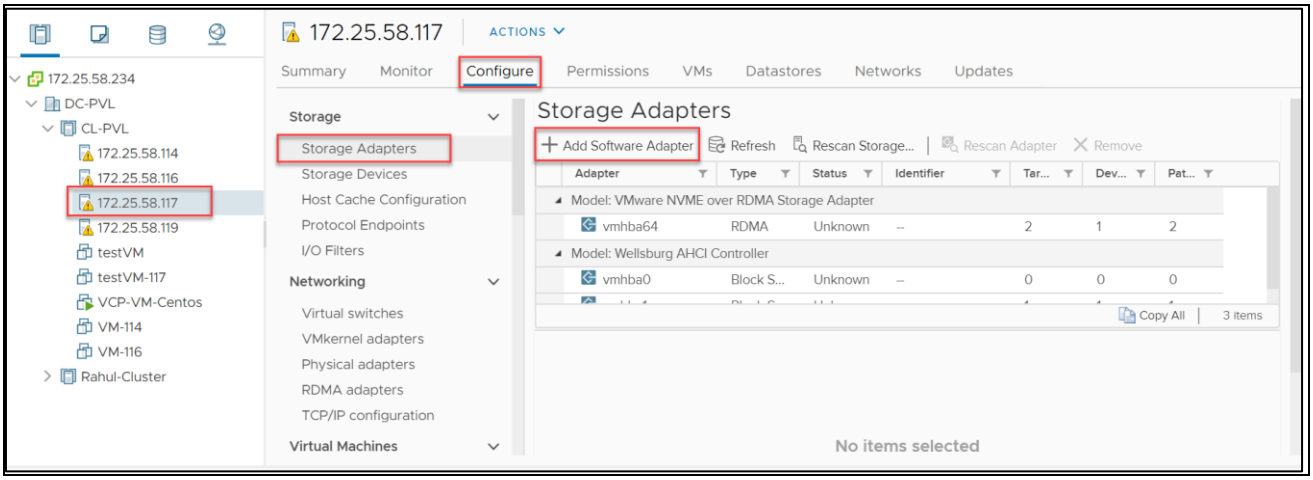
Steps to add software adapter is as follows:

Step 1: Login to the **VMware® vSphere™** Client.

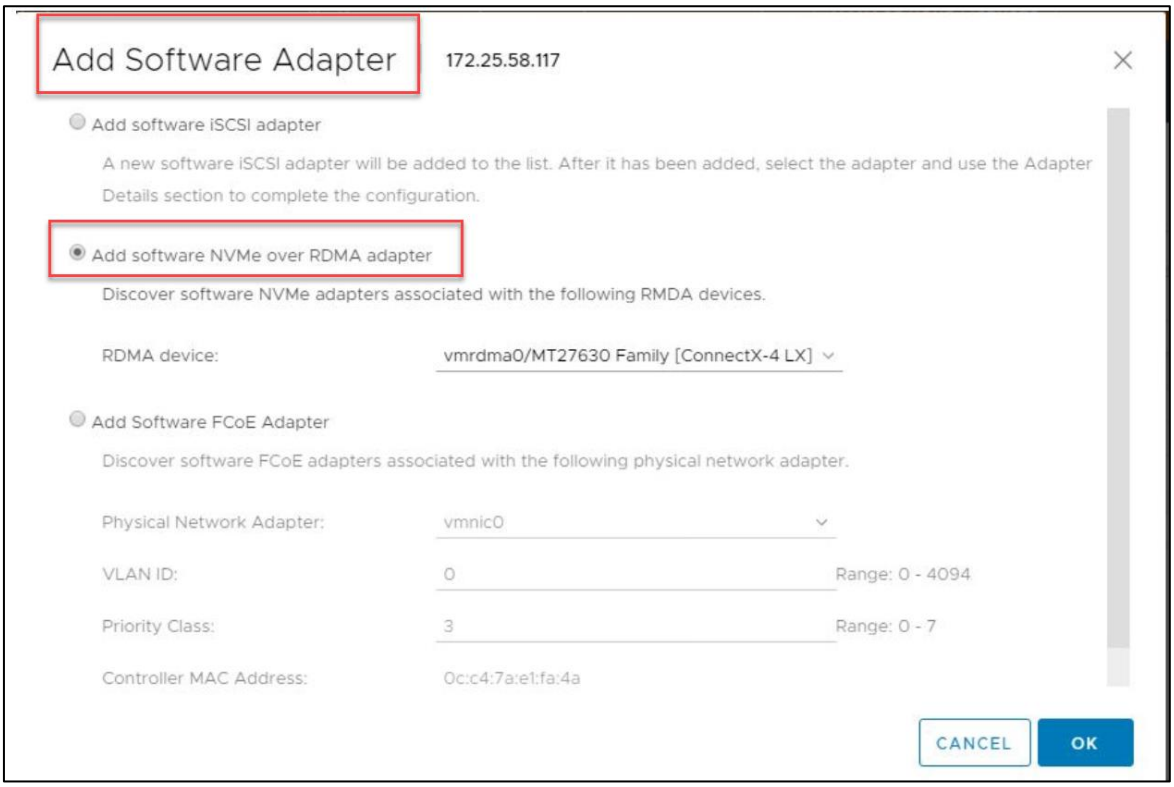
Step 2: Click on **Hosts and Clusters** option displayed on the left navigation pane. You could also click on **Hosts and Clusters** option displayed under **Shortcuts** as seen in below image:



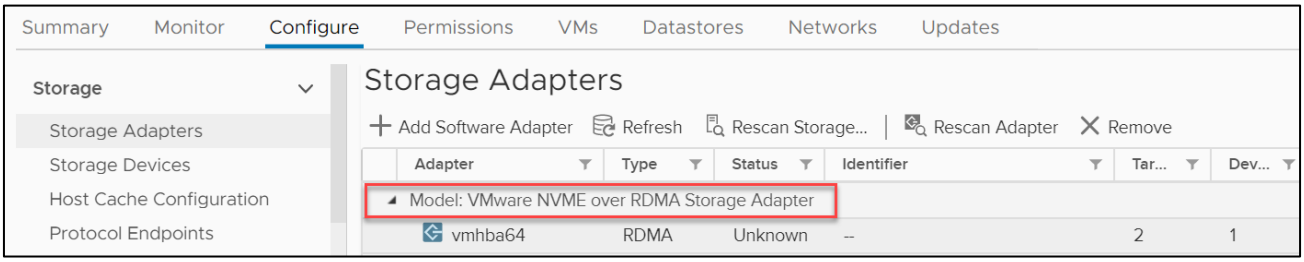
Step 3: Select the **VMware ESXi 7.0 host** that is to be configured, navigate to **Storage Adapters>Configure,** click on **Add Software Adapter** as seen in below image:



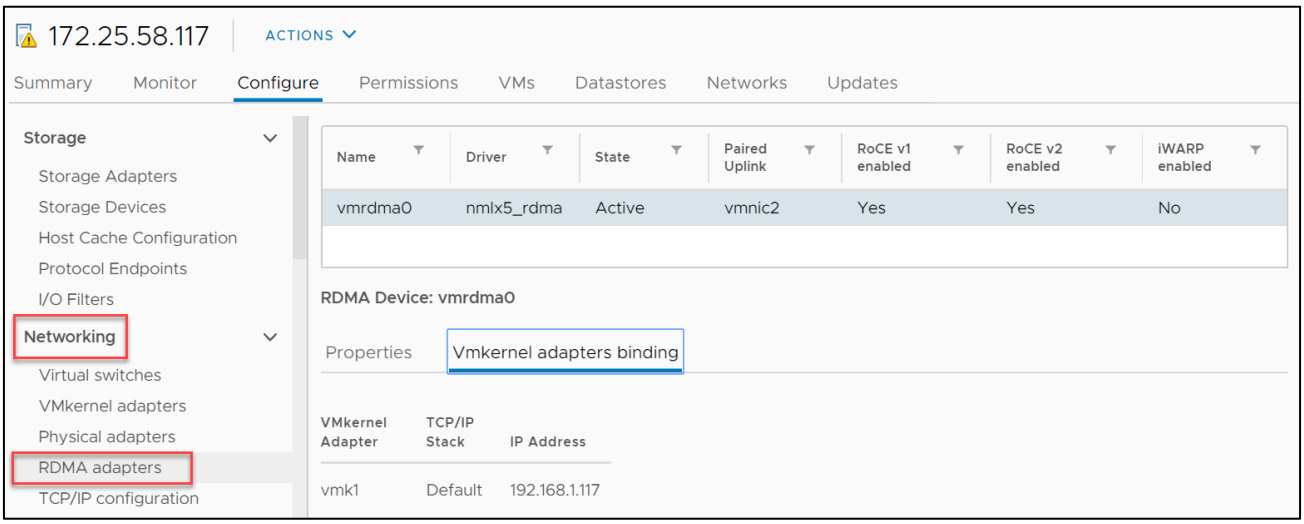
Step 4: The **Add Software Adapter** dialog box is displayed, select the option to **Add software NVMe over RDMA adapter** as seen in image below:



Step 5: Click **OK,** navigate to **Storage Adapters>Configure,** and look for *"VMware NVMe over RDMA Storage Adapter",* to verify if the configuration is a success or not.



Step 6: Once it is verified that the configuration is a success**,** navigate to **Networking>RDMA adapters>Configure,** and verify the **Vmkernel adapters binding** as seen in below image:

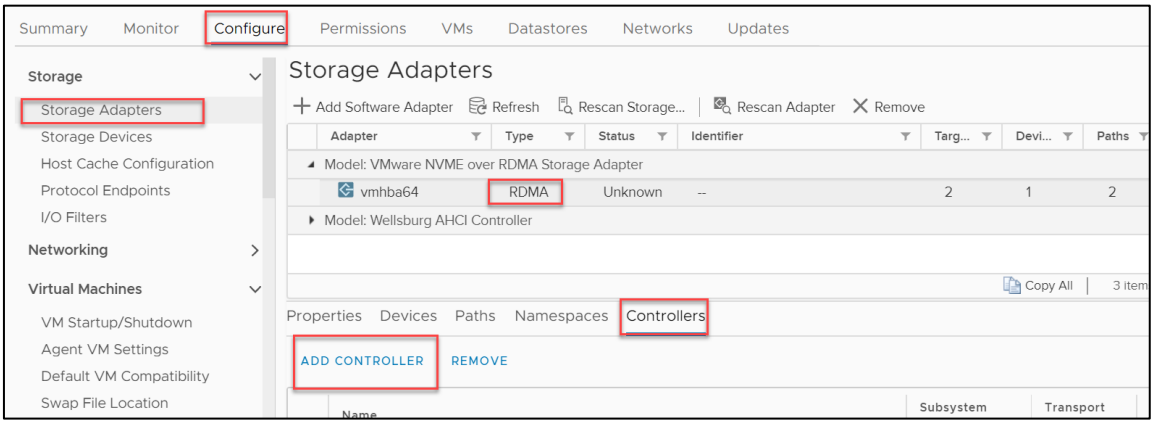


Note: User is to verify the binding with the desired **Vmkernel** interface.

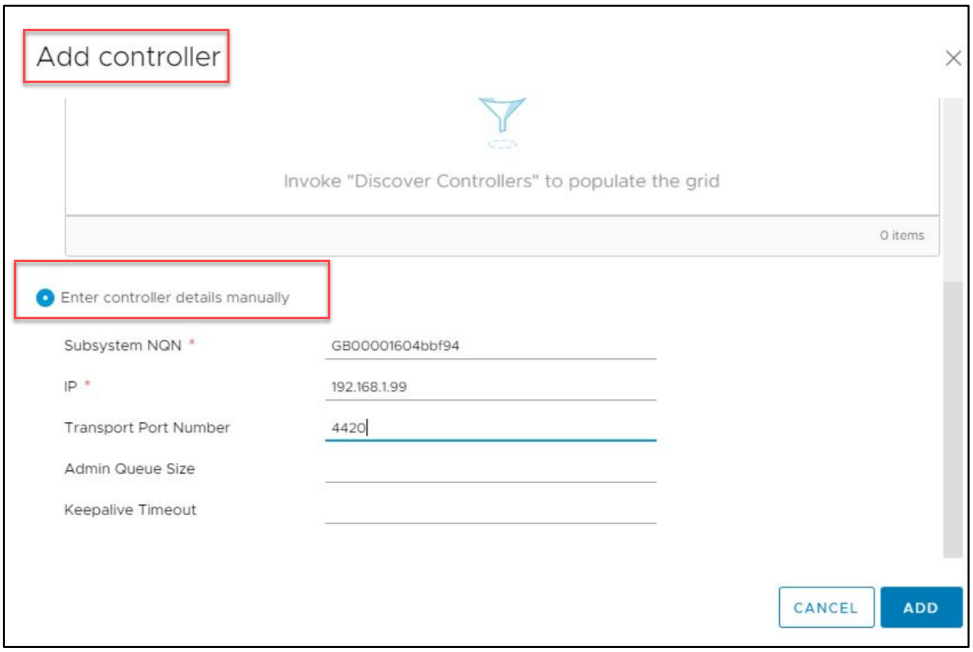
2.2 HOW TO ADD CONTROLLERS

Steps to add controllers is as following:

Step 1: Navigate to **Storage Adapters>Configure,** click on the RDMA Storage Adapter added, to proceed with the volume connection. Click on **Add Controller** displayed at the bottom of the page, as seen in below image:



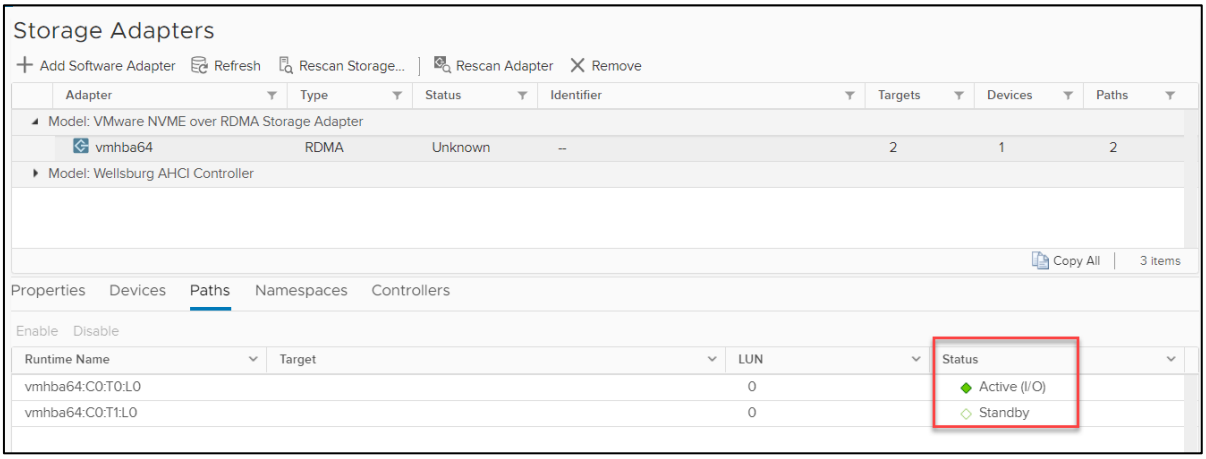
Step 2: The Add controller dialog box is displayed, scroll down the box and enter the details of the **Pavilion volume** under the section "***Enter controller details manually***"



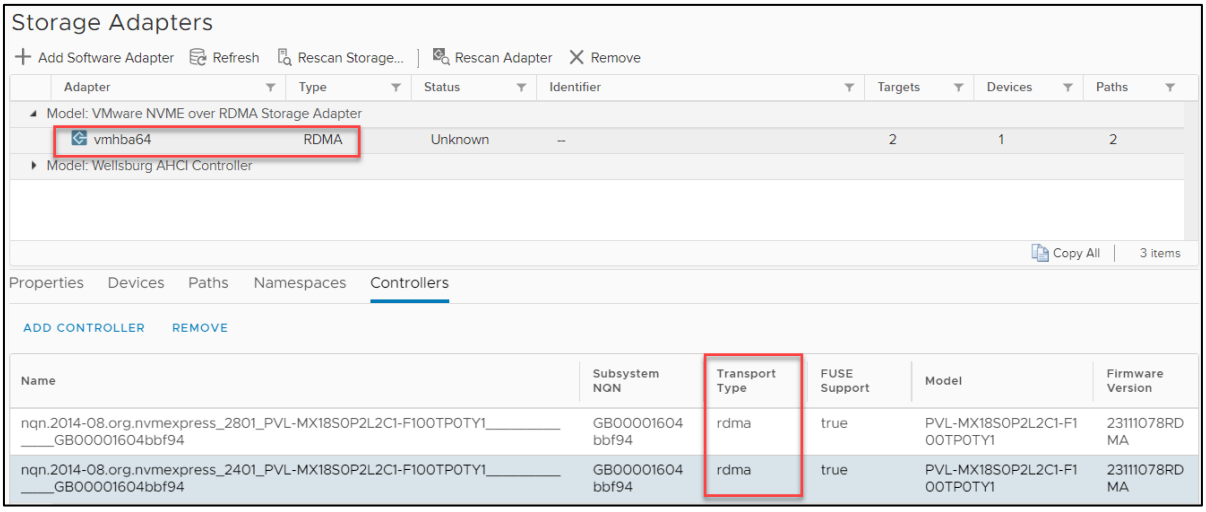
Note: The **Pavilion** volume is connected to an **Active** path, for this instance.

Step 3: Repeat **Step 2** to connect the **Pavilion** volume to the **Standby path.**

Step 4: Once the paths are set**,** verify if the volume connection is available for both the **Active** and **Standby** paths, by navigating to the **Paths** option displayed at the bottom of the content pane as seen in below image:



Step 5: Subsequently, verify that the volume has been connected to ***VMware NVMe over RDMA storage adapter*** as seen in below image:



Step 6: After connecting both the **Active/Standby** paths to the **Pavilion** volume, the user can go ahead and create a **datastore** on the volume.

3. CONFIGURING PAVILION RDMA VOLUME WITH ESXI 7.0 USING CLI

This section lists the steps required to configure **Pavilion** RDMA volume with ESXi 7.0 using CLI.

Step 1: The **`vmknic`** interfaces must be available for RDMA devices using the command:

```
# esxcli rdma device vmknic list
```

See snippet below for reference:

```
[root@alastair-n2:~] esxcli rdma device vmknic list
Device   Vmknic  NetStack
-------  ------  --------
vmrdma0  vmk1    defaultTcpipStack
[root@alastair-n2:~]
```

Step 2: Enable the RDMA device, this would add a storage Adapter for RDMA, using the command:

```
# esxcli nvme fabrics enable -p RDMA -d vmrdma0 true
```

Once added, the same can validated from the **vSphere™** client by using the navigation path: **Storage>Storage Adapters>Configure.**

Step 3: List the NVMe storage adapters using the following command:

```
# esxcli rdma device protocol list
```

See snippet below for reference:

```
[root@alastair-n2:~] esxcli rdma device protocol list
Device   RoCE v1  RoCE v2  iWARP
-------  -------  -------  -----
vmrdma0     true     true  false
[root@alastair-n2:~]
```

Step 4: List the storage adapter enabled for NVMe using the following command:

 # esxcli nvme adapter list

See snippet below for reference:

```
[root@alastair-n2:~] esxcli nvme adapter list
Adapter  Adapter Qualified Name          Transport Type  Driver    Associated Devices
-------  ------------------------------  --------------  --------  ------------------
vmhba64  aqn:nvmerdma:ec-0d-9a-8f-7e-1c  RDMA            nvmerdma  vmrdma0, vmnic2
[root@alastair-n2:~]
```

Step 5: Once the RDMA adapter is enabled, the NVMe device can be connected. Discover the **Pavilion** NVMe RDMA volume using the following command:

 # esxcli nvme fabrics discover -a <nvme adapter> -i <controller IP address>

See snippet below for reference:

```
[root@alastair-n2:~] esxcli nvme fabrics discover -a vmhba64 -i 192.168.1.99
Transport Type  Address Family  Subsystem Type  Controller ID  Admin Queue Max Size  Transport Address  Transport Service ID  Subsystem NQN    Connected
--------------  --------------  --------------  -------------  --------------------  -----------------  --------------------  ---------------  ---------
RDMA            IPv4            NVM                     65535                    32  192.168.1.99       4420                  GB00001604bbf94      false
[root@alastair-n2:~]
```

Step 6: Connect to the NVMe volume for both the Active and Standby paths by running the following command:

 # esxcli nvme fabrics connect -a <adapter> -i <controller IP address> -s <Subsystem NQN>

Example:

 # esxcli nvme fabrics connect -a vmhba64 -i 192.168.1.99 -s GB00001604bbf94

 # esxcli nvme fabrics connect -a vmhba64 -i 192.168.1.100 -s GB00001604bbf94

Step 7: Once the RDMA adapter is enabled, the NVMe device can be connected. The NVMe device connected can be listed using the following command:

```
# esxcli nvme namespace list
```

See snippet below for reference:

```
[root@alastair-n2:~] esxcli nvme namespace list
Name                                  Controller Number  Namespace ID  Block Size  Capacity in MB
------------------------------------  -----------------  ------------  ----------  --------------
eui.6130663833335372d303765332d3464               1196             1         512          102400
eui.6130663833335372d303765332d3464               1197             1         512          102400
[root@alastair-n2:~]
```

Step 8: The Active/Standby Paths of the **Pavilion** NVMe volumes can be listed by using the **namespace id** as indicated in **Step 7.** Run the following command:

```
# esxcfg-mpath -d eui.6130663833335372d303765332d3464 -l
```

See snippet below for reference:

```
[root@alastair-n2:~] esxcfg-mpath -d eui.6130663833335372d303765332d3464 -l
rdma.vmnic2:ec:0d:9a:8f:7e:1c-rdma.unknown-eui.6130663833335372d303765332d3464
   Runtime Name: vmhba64:C0:T0:L0
   Device: eui.6130663833335372d303765332d3464
   Device Display Name: NVMe RDMA Disk (eui.6130663833335372d303765332d3464)
   Adapter: vmhba64 Channel: 0 Target: 0 LUN: 0
   Adapter Identifier: rdma.vmnic2:ec:0d:9a:8f:7e:1c
   Target Identifier: rdma.unknown
   Plugin: HPP
   State: active
   Transport: rdma

rdma.vmnic2:ec:0d:9a:8f:7e:1c-rdma.unknown-eui.6130663833335372d303765332d3464
   Runtime Name: vmhba64:C0:T1:L0
   Device: eui.6130663833335372d303765332d3464
   Device Display Name: NVMe RDMA Disk (eui.6130663833335372d303765332d3464)
   Adapter: vmhba64 Channel: 0 Target: 1 LUN: 0
   Adapter Identifier: rdma.vmnic2:ec:0d:9a:8f:7e:1c
   Target Identifier: rdma.unknown
   Plugin: HPP
   State: standby
   Transport: rdma
```